

Chapter Two:

Scripting the Radical Critique of Science and Technology: STS, The Morrill Act, and the American Land-Grant University

... [E]ach State which may take and claim the benefit of this act, to the endowment, support, and maintenance of at least one college where the leading objects shall be, without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts ... in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life. (Act of 1862, Donating Lands for Colleges of Agriculture and Mechanic Arts)

2.1 General Introduction

This chapter argues that the Morrill Act of 1862 prefigures conceptions and criticisms of the relationship among science, technology and society, as conceived within science and technology studies (STS), by establishing patronage for American STS in land-grant universities. Traditionally, the Morrill Act's purpose was understood as democratizing American higher education (just as the purpose of STS was understood as democratizing science). Democratizing education, while a convenient legislative debate strategy, was seen as the primary goal of the Morrill Act neither by contemporary congressional representatives nor by the public. A closer look at the Morrill Act reveals that the government acted to solidify the relationship among agricultural, economic, military (to a lesser degree) and research interests, as well as raise revenue to retire debts. I argue the survival of American STS depends, in part, on remaining consonant with the economic mission of land-grant universities and the goals of university administrators. In this light, STS does possess a quality, interdisciplinarity, which makes it economically fungible. As state taxpayers clamor for market-based student training, and university administrators seek tangible reorganizing strategies, STS offers an adaptive model for interdisciplinary downsizing.

In Section 2.2 I propose that interdisciplinarity, conceived under the aegis of the Morrill Act, can serve as a means for downsizing, or eliminating, humanities and social science programs in support of the natural sciences and engineering. Section 2.3 takes a critical look at the origins of the Morrill Act. I claim the Morrill Act's primary goal was to solidify the American economic infrastructure in anticipation of the Civil War's outcome. As I will point out in section 2.4, the call for values education in science and engineering were answered in the 1960s, according to the received disciplinary view, by American STS. However, 1960s

radicalism was handcuffed in American universities in numerous ways. In land-grant institutions, STS was consigned to second-class academic citizenship as were the humanities and social sciences. During the 1980s, as section 2.5 will describe, the rise of a professional administrative class in universities further influenced the direction and purpose of interdisciplinary education. Supplied by STS practitioners, among others, the rhetorical slogan “democratizing knowledge through interdisciplinary cooperation” gave administrators a platform for reorganizing and downsizing programs unpopular with state taxpayers. In this chapter, then, I wish to establish a correlation among historical factors which gave rise to American STS. The degree to which the radical critique of science and technology provided by STS is independent of, or depends on, these historical factors remains a matter of debate.¹

2.2 Argument Summary

Contemporary calls for interdisciplinarity (or disciplinary integration) have been pegged by many scholars, among them Stephen Toulmin and Gerald Holton, as part of the constant swing between “unity and diversity in Western civilization.”² The growth in interdisciplinary scholarship over the last three decades seemingly indicates the emergence of

¹ The historical aims of STS, broadly conceived, are not a matter of consensus. Still, the formation of the field owes original intellectual debts to J.D. Bernal (*The Social Function of Science* London: Routledge, 1939; *Science in History* London: C.A. Watts, 1954) C.P. Snow (*The Two Cultures and the Scientific Revolution* New York: Cambridge University Press, 1959), Derek de Solla Price (*Little Science, Big Science* New York: Columbia University Press, 1963) and Thomas Kuhn (*The Structure of Scientific Revolutions* Chicago: University of Chicago Press, 1962). As Edge suggests (1995, 6-11), the growth and management of science and technology was of great concern during the 1950s and 1960s. One historical mission of the field, then, was to find ways to “manage” the science/society relationship. Another mission was to close the “two cultures” gap. The emphasis on “values education” for scientists was the result. The reform, then was to bring the humanistic concerns to bear on science education. As a result, the social consequence scientific and technological development were of great concern. Cutcliffe (1990, 360) argues that the formation of Cornell’s STS Program in 1969 was “... a response to campus unrest ...” and need to recognize the reciprocal effects among science, technology and society. While Cutcliffe offers as institutional history, contrasted with Edge’s intellectual history, STS curricula during the 1980s “...suggest[s] an increasing emphasis on the societal context of technology and technological innovation ... A recent textbook, authored by Alan Marcus and Howard Segal (1989) ... take an avowedly contextual approach ... Although there are differences as to where the emphasis should lie in taking a contextual approach to the history of technology, it is undeniable that this perspective has contributed measurably to our understanding of technology ... No technology can be completely understood outside the cultural context that helped to shape and define it ...” (my emphases, 368). While the “radical critique” of science and technology became an emphasis as the theory-wing (the “High Church”) of STS developed (especially in Europe) the practice wing (the “Low Church”) of STS was rooted, primarily in the values education movement in America. The pragmatic emphasis of American STS can be seen in the pedagogical move to “humanize” technology through cultural contextualization.

² Further illustrating the movement toward unity in interdisciplinary research, Gerald Holton, commenting on the rise of grand simplifying concepts (such as the second law of thermodynamics) observed: “The underlying epistemological thrust of science is towards a program of omniscience, the development of a scientific world picture that is so power and so simple in its fundamental assumptions that, from it, you can deduce all the phenomena of nature” (quoted in Klein 1990, 33). One can see the same inclination in STS in which totalizing discourse about the nature, and science, is omnipresent; for example that nature is socially constructed or that science is rhetorical “all the way down.”

a progressive social and academic movement as opposed to simple intellectual fashion.³ Emblematic of the rise of interdisciplinarity is the development of the field of Science and Technology Studies (STS). During the 1950's American land-grant universities began to answer public demands for a democratization of the liberal arts. "Technological humanism" exemplified the idea that studying scientific, technical, and professional subjects would yield a sufficient liberal education. In 1957 a program on Politics, Poetry and Human Values became a part of the United Steelworkers' program at The Pennsylvania State University.⁴ Debates over disciplinary ownership and responsibility for "human values" education led to the formation of courses about, and programs in, Science, Technology and Society in 1969 sponsored by Materials Science programs at San José State College and The Pennsylvania State University.⁵

³ Whether Science and Technology Studies (STS) should be an interdisciplinary "social movement" (characterized by "emancipatory" politics) dedicated to public policymaking, or a formal academic discipline, remains a matter of dispute. Examining STS's trajectory from its 1960's origins, Fuller sees the "Low Church" primarily concerned with the growing scientific, technological and military establishment. "High Church" STS, the more radical wing, seeks to deconstruct the epistemic authority held by scientists. (Steve Fuller *Philosophy, Rhetoric and the End of Knowledge: The Coming of Science and Technology Studies*. Madison, University of Wisconsin Press, 1993, xi-xxii).

⁴ At a Michigan State conference on industry and the liberal arts, United Auto Workers Education Director Brendon Sexton "... challenge[ed] the main conference sponsor (the Humanities Center for liberal Education in Industrial Society) to provide the blue-collar worker ..." with the same form of liberal education afforded "management elite." *The CEA Critic* of the College English Association in 1957 embraced Sexton's challenge in an answer published in the journal and reprinted widely. See Maxwell H. Goldberg "Liberal Learning and the Land-Grant System: Futures and Optatives" from *Land-Grant Universities and Their Continuing Challenge* G. Lester Anderson (ed.) (Michigan State University Press, 1976, 134-135).

⁵ Stephen Cutcliffe is largely responsible for developing the early canonical histories of the formation of STS. In "The STS Curriculum: What Have We Learned in Twenty Years" (*Science Technology and Human Values*, Vol. 15, No. 3, Summer 1990 360-372) Cutcliffe identifies the formation of the first Science, Technology and Society Programs at Cornell and the Pennsylvania State University in 1969. Programs were formed at Lehigh University in 1972 and MIT in 1977. The Ph.D. programs at MIT, Rensselaer Polytechnic Institute, and Virginia Polytechnic Institute and State University are mentioned by Cutcliffe as a sign of STS's maturation. Cornell, Pennsylvania State University, MIT, and Virginia Polytechnic Institute and State University are members of the National Association of State Universities and Land-Grant Colleges. Founded in 1824, thirty-eight years before passage of the Morrill Act, Rensselaer's patron, Van Rensselaer, and administrator, Amos Eaton, developed, arguably, the most influential school for technical training outside of a military academy (West Point was established in 1802). Ross (*Democracy's College: The Land-Grant Movement in the Formative Stage*. Ames, IA: Iowa State College press, 1942, 12-13) in citing, among other sources, P.C. Ricketts edited book *Centennial Celebration of Rensselaer Polytechnic Institute* claims; "The relations of this pioneer in technical education to the land-grant movement in leaders, subject emphasis, and methodology are clearly established. But Eaton and his fellow workers were many years in advance of their time." Patrick Hamlett, Director of the Program on Science, Technology, and Society at North Carolina State University lists twenty-six STS-type (including history and philosophy of science and technology, science, technology and policy, public policy, or culture) programs in the United States. Hamlett's list includes graduate and undergraduate (including minors) programs as well as distinct programs at the same university (e.g., Georgia Tech) (<http://www2.ncsu.edu/ncsu/chass/mds/stsprog.html>, March 28, 1996). In breaking down the tuition and fees at 1862 institutions in 1992-1994, the Committee on the Future of Land Grant Colleges of Agriculture (CFLA) lists fifty-four colleges and universities. Of the twenty-six STS-type programs Hamlett lists, seven appear on the CFLA list. Additionally, some schools not listed by the CFLA are members of the National Association of State Universities and Land-Grant Colleges (e.g., the University of Pittsburgh). Anderson ("Land-Grant Universities and Their Continuing Challenge" in G. Lester Anderson (ed.) *Land-Grant Universities and Their Continuing Challenge*. Michigan State University Press, 1976, 1-2, 353-354, Table 1) points out that the distinction between land-grant and the "non-land but public" university continues to blur. Still, as he rightly points out: "The values that have infused these institutions for over a century continue to be emphasized and constitute a system that merits consideration ... " (1-2). Of course not all American STS

The received view of Morrill Act (also known as the Land grant Act of 1862) as “the fullest expression of democracy in higher education” can be challenged in light of historical and economic exigencies.⁶ As Key (1996) and Ross (1942), to a lesser degree, claim, the debate over land-grant education was one of economics not education. The Morrill Act formalized the relationship among public lands, agricultural production, scientific and technological advancement, consumption, and national prosperity. By constructing the site and conditions for the interplay of American research, technology and the military in service to the state, the Morrill Act effectively scripted the forms of radical critique which STS could forward. The academic commodification of STS in American research universities produced unintended consequences. First, STS helped assuage taxpayers’ anxiety about the absence of “values” training for apprentice scientists and engineers, and answered demands for a “practical humanistic education” – one mission of the land-grant university. Second, the promise of broad disciplinary syntheses concentrated on identified social problems gave university administrators a means for eliminating traditional departments.

Interdisciplinary programs created in the atmosphere of economic recession during the late 1980s lacked identity and coherence.⁷ In some cases interdisciplinary advocates were asked to bite the bullet in support of their cause; namely, the programs in which they participated

resides in land-grant and public universities. In proposing to investigate campus interest in an STS program at the University of Michigan, Robert Frost (<http://www-personal.umich.edu/~rfrost/misc/STSprop.html>) lists “premier” STS programs among both members of the National Association of State Universities and Land-Grant Colleges (as is the University of Michigan) – MIT, Cornell, University of California, San Diego – and non-members – Harvard, Northwestern and the University of Pennsylvania. As well, programs without the STS designation proper are listed as STS programs. Cutcliffe’s observation holds that no comprehensive listing of STS programs exist, although some web sites supporting STS programs link to Hamlett’s list.

⁶ The Committee on the Future of Land Grant Colleges of Agriculture, Board on Agriculture, National Research Council, National Academy Press, Washington, D.C. 1996; <http://www.nap.edu/readingroom/books/landgrant/>) reports that: “In 1862, almost 50 percent of all U.S. residents lived on farms, which employed almost 60 percent of the labor force... The 1862 Morrill Act produced land grant colleges in every state and territory and the District of Columbia. The 59 resulting colleges (including 3 within the University of California system and 6 in U.S. territories) are known as the 1862 colleges or ‘1862s.’ The second Morrill Act, which mandated access to African Americans, gave rise to a set of historically Black colleges located in southern states and known as the 1890 colleges or ‘1890s.’ There are 17 1890 institutions—16 public state colleges and Tuskegee University ... The two Morrill acts and two subsequent pieces of land grant legislation, the 1887 Hatch Act and the 1914 Smith-Lever Act, together endowed the LGCAs with a three-part mission of teaching, research, and extension. Extension was designed to link the colleges’ academic and research programs to societal needs through a public service function that includes extended education and technology transfer. Motivated by the desire to draw each state and territory into supporting science and education related to agriculture, land grant legislation created a federal-state partnership in agricultural research and technology transfer.”

⁷ I refer here to the creation of various “studies” fields formed in the 1970s and 1980s formed in a more or less direct response to student and faculty demands of the 1960’s. Examples include area studies, American studies, Appalachian studies, women’s studies, black studies, religious studies, Judaic studies, leadership studies, science and technology studies, and of course, interdisciplinary studies. Often these programs are sponsored and housed within traditional disciplines, or are combined into interdisciplinary centers. See, for example, Boger and Boyd (“Institutional Policy and Operational Issues Affecting Interdisciplinary Research” In *Enabling Interdisciplinary Research: Perspectives from Agriculture, Forestry and Home Economics* Martha Russell et al. (eds.) University of Minnesota 1982, 87-93)

were the first to be reorganized by administrative fiat. Since these programs had no disciplinary integrity, and had to pay ideological lip service to non-hierarchical administrative structures, they could be fashioned to serve the broader research interests.⁸

The critical impulses of interdisciplinary inquiry were short-circuited by attention to disciplinary integrity in the face of constrained state resources and public outcry for more teaching and less research.⁹

2.3 The Morrill Act

Originally introduced 1857 by a Vermont congressional representative, Justin Smith Morrill, the Land Grant College Act was signed on July 2, 1862.¹⁰ What later came to be known the First Morrill Act apportioned 30,000 acres of public land in each state, based on the 1860 census, for each Senator and Representative.¹¹ The land was to be sold and the money placed

⁸ Boger and Boyd suggest that “New colleges [e.g., the University of California, Santa Cruz and the University of Wisconsin, Green Bay] organized around contemporary social concerns no doubt go the farthest toward integrating traditional disciplines” (90). In traditional settings “... interdisciplinary organizational units are generally viewed by faculty and administrators as supplements or appendages to the “basic” structure of the university -- the more traditional colleges and departments. At best, faculty and administrators lend partial support for the legitimate claim by such units to the university’s limited resources. Seldom is there a university-wide commitment to the goals of the interdisciplinary unit ... As competitive members of the “budget club”, it is difficult for such organizations to provide organizational counterpoints or to act as agencies for disciplinary integration. The institute or center is perhaps the most prevalent university-based organization for interdisciplinary research ... Most often responsible to a college dean ... the institute is not generally seen in the same light as a department. Unfortunately ... it seldom provides its administrator the luxury of budget line security.” (original emphasis, 91)

⁹ The “first” interdisciplinary movement is seen as extending from the end of World War I to the 1930s. However, the 1960s and 1970s are considered (see Klien 1990, 35-39) as the “watershed era” in interdisciplinary development. STS gains an institutional foothold during this era during the early to mid-1970s. While Klein cites “undeniable” momentum in the interdisciplinary movement (38-39) the obstacles which appeared in the 1980s included a reassessment of the payoffs of interdisciplinary research, calls for “academic responsibility”, disciplinary retrenchment, and the splintering of the movement. The American economic recession of the late 1980s and early 1990s interrupted the momentum Klien identified, and required university administrators to reconsider their commitments to interdisciplinarity. Boger and Boyd note that: “Those that cry for accountability on the part of higher education today cite the overlapping pragmatism that has pervaded postsecondary academics as one of the reasons why this [interdisciplinary research] is needed. Administrative commitment to the organizational concepts of innovation and change is essential to the continued identification and the implementation of experimental programs ... Without longitudinal administrative commitment to the philosophical concepts of interdisciplinary organization, the probability is very high that any efforts at such change will fail” (1982, 89).

¹⁰ Morrill’s original bill was introduced on December 14, 1857. The bill passed in Congress but was vetoed by President Buchanan. Key (1996) notes that Buchanan’s veto message indicated, among other things, uncertainty about the constitutional power of Congress to give away public land and the equity of the impact on “old states.”

¹¹ The argument as to who should receive credit for “... having first devised and formulated the original plan and of having worked up public interest in the measure so that it could be passed ...” (James 8) began in earnest in 1907 at the 28th annual meeting of the Society for the Promotion of Agricultural Science. Eugene Davenport, Dean of the College of Agriculture at the University of Illinois argued that Professor Jonathan Baldwin Turner (1805-1898) of Illinois College deserved credit for originating the land-grant act. Davenport’s conclusions were based on his examination of Turner’s correspondence. A letter from Illinois legislator Richard

into an endowment which supported colleges in each of the states. States which lacked the sufficient public lands within their borders were to be issued land scrip in an equivalent amount. Ostensibly, the aim of the Morrill Act was to bring higher education to the working classes by teaching agriculture and the “mechanic arts” to promote liberal and practical education.¹² The five year debate proceeded on two fronts: First, and most prominent, over the potential sale of state land and the dispensation of endowments. Second, and post-passage, over the land-grant college curriculum.¹³ And while the Morrill Act came to be hailed as a step toward democratizing United States education, other criticisms, over time, were raised.¹⁴ University leadership was questioned.¹⁵ Opportunities for minority groups were limited. Shortly before his death in 1968, Martin Luther King castigated the land-grant system for being a federal instrument protecting the interests of wealthy farmers.¹⁶ Aided by farm mechanization and

Yates in June 1852 acknowledges receipt of Turner’s proposal which inspired the following resolution on February 8, 1853 that “... our Senators in Congress be instructed, and our Representatives be requested, to use their best exertions to procure the passage of a law of Congress donating to each state in the Union an amount of public lands not less in value than five hundred thousand dollars, for the liberal endowment of a system of Industrial Universities, on in each state in the Union, to co-operate with each other and with the Smithsonian Institute in Washington, for the more liberal education of our industrial classes and their teaches; a liberal and varied education, adapted to the manifold wants of a practical and enterprising people ...” (as quoted in James 16). In October 1857, Senator Lyman Trumbull from Illinois wrote to Turner that his plan should be presented by a representative from one of the “old states” as Congress had already paid a good deal of attention to education in the “new states.” Turner’s daughter, Mary Turner Carriel, stated that she heard her father explain that Morrill had been selected by him and his associates because he was from an old state. (see James, Appendix A, 35). In 1910, President of the University of Illinois, Edmund James thesis (Edmund J. James, *The Origin of the Land-Grant Act of 1862 (The So-called Morrill Act) and Some Account of its Author Jonathan B. Turner*. Urbana-Champaign: University Press, 1910) supported Davenport’s contention that Turner was the father of the land-grant act. Ross (1942 48-55) dismisses these arguments by noting Morrill’s appreciation for applied science programs, his contradictory remembrances (and the Illinois group’s “contemporary self-congratulation”), the general atmosphere of state educational reform, and the “embarrassing lack” of evidence which was “either inconclusive or contradictory.”

¹² David Madsen “The Land-Grant University: Myth and Reality” from *Land-Grant Universities and Their Continuing Challenge* G. Lester Anderson (ed.) (Michigan State University Press, 1976, 34.)

¹³ Andrew D. White, president of Cornell University from 1868-1885 (later ambassador to Russia and Germany) stated the pedagogical mission of land-grant college education was: “Make your student a master-farmer, or a master-mechanic; but make him a master-man.” Edward Danforth Eddy Jr., *Colleges for Our Land and Time* (New York: Harper and Brothers, 1956, 55).

¹⁴ James’ (1910 12 -13) following hyperbole lends a window on the controversy surrounding the Land-Grant Act’s origins: “... education is not merely a local, not merely a state, but that it is also a national matter; that its importance is fundamental ... education is a national function, as much as war, or the protection and furtherance of commerce or the establishment of justice. It is not too much to claim, then, that the federal land grant of 1862 marks the beginning of one of the most comprehensive, far-reaching and one might say grandiose, schemes for the endowment of higher education ever adopted by any civilized nation.”

¹⁵ Louis G. Geiger *Higher Education in a Maturing Democracy* (Lincoln: University of Nebraska Press, 1963, 73-84.)

¹⁶ “At the very same time that America refused to give the Negro any land, through an act of Congress our government was giving away millions of acres of land in the West and the Midwest, which meant that it was willing to undergird its white peasants from Europe with an economic floor. But not only did they give the land, they built land-grant colleges with government money to teach them how to farm. Not only that, they provided county agents to further their expertise in farming. Not only that, they provided low interest rates in order that they could mechanize their farms. Not only that, today many of these people are receiving millions of dollars in federal subsidies not to farm, and they are the very people telling the black man that he ought to

incorporation, agribusinesses displaced rural farmers and consigned them to poverty. Morrill's vision of egalitarian education transformed Thomas Jefferson's "chosen people of God" – the citizen farmer – into the ideal industrialist – the self-reliant genius mechanic. By securing a place where scientific and technological resources could be marshaled and deployed as state interests dictated, the educational services provided by land-grant institutions depended, in great measure, on economic boosterism.

The consensus among historians writing about the Morrill Act from the early 1940's through the late 1970's was that " .. the land-grant college movement [was] part of the educational evolution of the United States." However, as Cremin (1980) argues, establishing a national education network would be used by the federal government for a "variety of enterprises."¹⁷ The priority of the United States federal government after the Revolutionary War was retiring the national debt; a rhetorical trope prominent in the 1840's and revisited in the 1980's and 1990's. While agriculture was, of course, the foundation of national prosperity, the Articles of Confederation limited the ways in which the government could collect revenue.¹⁸ Congress had no power to levy and collect taxes, but could sell public lands ceded in the Treaty of Paris (1763). Congress was divided on the whether the land should be sold directly (Alexander Hamilton), or given to settlers who would develop it (Thomas Jefferson). Initially, the government favored the direct sale of lands. Over the next century, numerous land disposal acts and purchase incentives were passed establishing the congressional position that public lands were a retail asset.

lift himself by his own bootstraps. And this is what we are faced with, and this is the reality. Now, when we come to Washington in this campaign, we are coming to get our check." Shortly before his assassination, King began the Poor People's Campaign. According to Kathleen Cleaver, "The Poor People's Campaign was supposed to go to Washington in April. So the organization that mobilized it was essentially decapitated and thrown into chaos about three weeks before it was supposed to happen." (from "The Two Nations of Black America" *Frontline* Original Air Date: February 10, 1998, Produced by June Cross; Henry Louis Gates, Jr., Correspondent; Written by June Cross and Henry Louis Gates, Jr.; <http://www.pbs.org/wgbh/pages/frontline/shows/race/etc/script.html>)

¹⁷ Key's literature review of work on the Morrill Act points to four widely acknowledged works which have prominent places in this paper: Earle D. Ross *Democracy's College: The Land Grant College in the Formative Stage* (Ames, IA: Iowa State College Press, 1942), Edward D. Eddy *Colleges for Our Land and Time: The Land-Grant Idea in American Education* (New York: Harper, 1957), Joseph B. Edmonds *The Magnificent Charter: The Origin and Role of the Morrill Land-Grant Colleges and Universities* (Hicksville, NY: Exposition Press, 1978), and Allan Nevins *The State Universities and Democracy* (Urbana, IL: University of Illinois Press, 1962). Key does not cite G. Lester Anderson (ed.) *Land-Grant Universities and Their Continuing Challenge* (Michigan State University Press, 1976) which offers disciplinary practitioner's perspectives on the land-grant system. While Key's point that the Morrill Act was more about selling public lands to generate federal revenue than educational reform is well taken, Ross, for example, does not deny that possibility (see Chapter 3). The lack of congressional debate about educational theory, and the understandable lack of enthusiasm by affected states during the Civil War, suggests putting in place a national economic infrastructure not rearing "citizen-mechanics" was the primary consideration of the government; a policy made easier to implement by southern succession.

¹⁸ The Articles of Confederation were adopted in 1781 by the thirteen American colonies and replaced in 1789 by the United States Constitution.

Received in the heady atmosphere immediately preceding the American Civil war, initial debate over Morrill's proposed legislation centered on the role of the federal government in determining regional and sectional land interests. "Like the other nationalistic projects of the decade, the college grant policy ran athwart the new sectionalism ... A measure appealing mainly to the interests of agriculture and labor was put at an obvious disadvantage through the sectional alienation of the most unified and influential agricultural group [southern farmers] and the lack of a labor bloc" (Ross 1942, 56). The introduction of Morrill's proposed legislation in 1857 confronted the Hamiltonian and Jeffersonian position on public land use. Defending the bill, Morrill referred to poor contemporary land management practices and their possible solution stemming from European science and technical education. Morrill artfully wedded the Jeffersonian notion of educating citizens as the "proprietors of the soil" to the Hamiltonian desire for direct federal revenue. Presenting the House majority report on the bill, Williamson Cobb, from Alabama, defended the position that public lands were a trust and the federal government was the trustee. The trust was originally intended to retire war debts (the Mexican War ended in 1848) and provide a federal operating budget. The gift of public lands would violate the beneficiaries' rights unless the value of adjacent lands were increased, which, in turn, would increase direct federal revenue. Cobb's rejoinder to Morrill set the tone for the broader debate which involved economics and constitutional interpretation.

Southern opposition had a familiar refrain. In the original debate, questions about state autonomy were raised as well as doubts regarding long-term federal commitment to the Land-Grant Act. Moreover, if states were unwilling to found agricultural and mechanical colleges, the federal government lacked the authority to enforce compliance. After the failure of the Washington Peace Convention and the subsequent formation of the Confederate States of America in 1861, federal attention turned west. New states and western territories became concerned about their recently acquired, and potential, sovereignty. The college bill symbolized an effort " ... of the old financial centers to control the destinies of the new." (62) Established states had "sinister designs" on the available land in the new states and the free west.

State colleges were also seen as a locus for combining national and regional resources for military, professional and commercial development.¹⁹ Morrill's technological enthusiasm

¹⁹ Ross (1949, 61) remarks that the original bill was revised, in part, to add "military tactics to the required subjects" taught in state colleges. "The military requirement marked a tardy acceptance by the North of an educational feature long prevalent in the South. There was an opinion, both lay and professional, that such training had given the Confederates a marked advantage at the beginning of the contest [the Civil War] in trained or partially trained officers. Hence, the new colleges should train officers for the militia of their state, and as West Point had combined civil with military engineering, the new nationally endowed school would combine military training with their instruction for civilian pursuits." In 1862, the New York board of

gained rhetorical purchase from the timely embrace of individual accomplishment. “Mechanics” (engineers) and miners were lauded for promptly delivering goods and “labor-saving contrivances” while heroically pursuing their education by twilight. (195)

Alike in debate and editorial [over the Morrill bill] there was a discouraging but characteristic lack of consideration for the educational theories and policies involved ... advocates of the bill simply reiterated the complaints of class neglect and discrimination; and made no adequate presentation of the claims of technical education as such. The opposition presented the double argument that such institutions were not needed and that, if they were, the proposed grants would be entirely inadequate to establish and maintain them. there were the traditional appeals to individual self-sufficiency and exploitative enterprise. All the farmers needed or desired from government was to be let alone; all the new communities needed was to get more and bigger farms. Even less did the industrial states require agricultural colleges. (Ross 63)

After potential amendments were side-stepped and political obscurantism played out, the Morrill bill passed over western opposition. President Lincoln’s approval was assumed. Lincoln’s belief in the limited role of the executive branch in matters of congressional finance, and his passive understanding of industrial education, did not cloud his judgment about what made for good politics. In addition, Lincoln’s apathy reflected the public mood. Contemporary agricultural newspapers, which had vigorously debated the vices and virtues of the Morrill bill, showed little interest in its passage. Ross (65-66) submits that the flat reception indicates uncertainty about the act’s effect. The land or script value, which had no mechanism for collection, was undetermined. How states would utilize the funds to develop industrial education was unclear. Would the assets be used to support existing industrial education programs, or used to establish new institutions?²⁰ Still, the most nagging and neglected questions regarded the look and purpose of “practical” agricultural and mechanical education.

regents “... reported a plan for militia drill at state expense in six colleges and one academy” Quoted in the weekly edition of the *Iowa State Register*, April 6, 1883, Paul Chadbourne, President of the Massachusetts Agricultural College, stated the purpose of the land-grant act was: “to raise up a generation of men who shall understand all the principles of agriculture, all the principles of the mechanic arts, and at the same time shall be perfectly trained for service in time of invasion or rebellion to organize armies and lead them on the battlefield.” (Ross, 1949, 197)

²⁰ David Madsen (“The Land-Grant University: Myth and Reality” from *Land-Grant Universities and Their Continuing Challenge* G. Lester Anderson, ed. Michigan State University Press, 1976, 37) cites Louis D. Corson’s unpublished dissertation (*University Problems as Described in the Personal Correspondence among D.C. Gilman, A.D. White, and C.W. Eliot* School of Education, Leland Stanford Junior University, 1951, 143) which provides correspondence from Charles Eliot (then president of Harvard) to Daniel C. Gilman, October 21, 1873 and describes “... subsidies to agricultural schools symptomatic of a ‘deep-seated disease’ resulting from governmental interference in the affairs of citizens.” Madsen parenthetically notes that: “Eliot seems to have forgotten that Harvard College, founded by the Commonwealth of Massachusetts had been beneficiary of a not inconsiderable amount of public monies over the years. Furthermore, he had served as president of M.I.T., another recipient of public funds.”

“Superlative encomium of the measure as the ‘greatest act in the history of higher education’ would find no contemporary recognition. The possibilities of this plan of national aid were only to be manifested in the course of time as the states utilized it in accord with their particular conditions and needs.” (67)

Defining the goals of agricultural and mechanical education in the context of the Morrill Act would become a focal point in late nineteenth century American higher education. While experimentation was seen as essential to land-grant institutions, the design of experiments was contested. “... [A] persistent confusion [existed] between the showily successful ‘model’ farm and experimental plots, equipment and livestock. The spic-and-span farm setup had a direct demonstrational appeal to the farmer and prospective farmer that the average field and laboratory experiments could not make.” (Ross 136). Absent resources to combine showpiece farming and engineering projects with testing laboratories, questions arose about the place of experimental research in the classroom. In 1882 Regent Peabody of Illinois worried that the quest for new knowledge would neglect that which was already known: “ ... conduct[ing] his pupil over the well-known ground of clearly established truth ...” would take all of the conscientious teachers “ ... means and time and strength at his disposal ... If his investigation will help his instruction, let him investigate; if it interferes with his instruction, let him obey the law and teach.” (137) The tension between the “clearly established truth” in the applied sciences and pedagogy was mitigated by the passage of the federal experimental station act of 1887. Agricultural stations, following a model begun in western Europe in the 1850’s, were primarily concerned with analyzing commercial feeds and fertilizers. As crop and farm development and production became the focus, distinctions were drawn between research having an immediate (and popular) application, and long-term, complex research.

Throughout the 1870’s and 1880’s consideration began in earnest about the social obligations of land-grant students. Cornell’s president, Andrew D. White, proposed that in order to overcome their lack of proportionate political representation, farmers and mechanics take courses in history, political science and public speaking. Daniel C. Gilman, the first president of Johns Hopkins University and the Carnegie Foundation, called for technical students, in his 1872 California inaugural, to be able to “pronounce opinions” on current social issues affecting statecraft. As industrialism took root in the United States, so did an interest in economics. Morrill urged the journalist Horace Greeley, two years before his death in 1872, to prepare a textbook on economic theory to defend American trade protectionism: “All our college-educated men are educated as Free-Traders. This ought not to be so.” (Ross 221) Still, Ross notes a shift in intellectual attitudes toward the end of the century:

By the eighties the new forces were beginning to penetrate even academic complacency and conformity. The farmer and labor movements were creating a new cleavage and consciousness; a literature of protest was raising doubts of the powers that were in all realms, and a social gospel was awakening eager if often vague and ill-directed desire for uplift and betterment ... Land-grant colleges shared these civic ventures ... Their special contribution was in the intermingling on a common social level of all branches and grades of study ... and in the direct contacts that the colleges made with their states at large in the systematic dissemination of the finds of its experimenting and resident teaching in all lines of active interest. (150-151)

Supporters of land-grant institutions loosened the rhetoric of democratized education, generally, and the liberal arts, specifically, from its Victorian moorings by appropriating the works of Matthew Arnold and T.H. Huxley. As a government inspector of schools, Arnold aided in shaping “new humanism” – the study of philosophy, history, literature and theology as “living representation of man’s thoughts” – for British students.²¹ “Huxley agreed with Arnold that a quality liberal education was desirable; but he insisted that, if he had to choose between an exclusively literary-philosophical-historical education and an exclusively scientific one, he would prefer the latter” (Goldberg 135). Consequently, Huxley suggested, scientific, vocational and professional education would yield the necessary humanist virtues of a liberal education. In 1851 James Baldwin Turner expressed the American inculcation of new humanism by advocating a National Institute of Science (an additional aid to the contemporary mission of the Smithsonian Institution) and universities for the industrial classes which “... ought to have ... facilities for understanding the true philosophy, the science and the art of their several pursuits.”²² The democratic ethos of science, apparently, could substitute for the liberal ethos of humanism. “For America the credit [of democratized education] was political and social stability; for elitist Europe the debit was instability.”²³ The New World staging ground for social progress would be science writ large in the land-grant system. Just as the “experimental form of life” promoted in early modern science helped to secure and stabilize Restoration culture, the “agricultural-mechanical form of life” defined the relationship, during American Reconstruction, among the state, the land, and the people.²⁴

²¹ Edward Danford Eddy, Jr. *Colleges For Our Land and Time* (New York: Harper & Brothers, 1956, 3-4).

²² As quoted in David Madesen “The Land-Grant University: Myth and Reality” from *Land-Grant Universities and Their Continuing Challenge* (G. Lester Anderson (ed.) Michigan State University Press, 1976, 29).

²³ Russel I. Thackrey, *The Future of the State University* (Chicago: University of Illinois Press, 1971, 21).

²⁴ Robert Boyle’s “success” in securing “...the Restoration settlement” was, in part, a result of “insinuating” science, as a the knowledge producing enterprise, into the activities of the state (Steven Shapin and Simon

The 1890 Morrill Act (the so-called “second Morrill act”) helped create black land-grant colleges and universities, and designated funding for instruction in the mechanic arts, agriculture, English, mathematics, and the physical, natural and economic sciences. Although modern-day disputes continue over the equity of state stewardship of first and second Morrill Act institutions, supporters hailed the progressive social nature of land-grant education. However, even in the age of a “new consciousness” the mission of land-grant institutions to “... minister to all the people without reference to their means ...” was circumscribed by scientific interests.²⁵ Land-grant education sanctioned relationships which existed to support and promote science and technology in service to the state. The seeds of the military-industrial complex Dwight Eisenhower would describe on leaving the presidency in 1961 were sown a century earlier: “Yet, in holding scientific research and discovery in respect, as we should, we must also be alert to the equal and opposite danger that public policy could itself become the captive of a scientific-technological elite” (*New York Times*, 18 January 1961).²⁶ The Morrill Act would help set the public policy stage and provide actors who would play the scientific-technological elite. On a smaller stage, university administrators would help form and direct programs that delineated the franchise of scientific and technological researchers – and their critics. Science and Technology Studies in the United States would be received in this context.²⁷

2.4 Elements of the Received View of STS History

... [T]he original aims of STS pioneers are still very much alive and relevant; that the intellectual and diplomatic task they entail still offer exciting

Schaffer *Leviathan and the Air-Pump: Hobbes, Boyle, and the Experimental Life*. Princeton: Princeton University Press, 1985, 342). Justin Morrill’s legislation rectified Thomas Jefferson’s formulation “... we have land to labour then, let us never wish to see our citizens occupied at a work-bench ... let our work-shops remain in Europe.” (from “Query XIX: Manufactures” in *Notes on the State of Virginia*, 1785 W. Peden (ed.), 1955) by scientizing farming. Morrill’s legislation is especially propitious; integrating the strengths and interests of the Union (and the Old World), manufacturing, and the Confederacy (and the New World), agriculture, into the research system. The rhetorical aggregate supporting the Morrill Act added the ethos of democratized knowledge to the kairos of the American civil war.

²⁵ Ross quotes A.S Draper, *American Education*, 191. To further illustrate the point, Ross lends an interesting quote from G. Brown Goode of the Smithsonian Institution in 1890: “The [land-grant] movement was at first unpopular among American educators ... but is by many regarded as forming one of the chief strongholds of our national scientific prosperity.” “The Origin of the National Scientific and Educational Institutions of the United States,” *Papers of the American Historical Association*, IV, Pt. 2, 70.

²⁶ “Eisenhower’s Farewell: The Epistemic Function of Argument” in *Perspectives on Argumentation* Robert Trapp and Janice Schuetz (eds.) (Prospect Heights, IL: Waveland Press, 1990, 151-161).

²⁷ One can read Steve Fuller’s characterization of Thomas Kuhn as a cold warrior in the service of James Bryant Conant (“Teaching Thomas Kuhn to Teach the Cold War Vision of Science” *Contention* Vol. 4, No. 1 Fall, 1994, 81-106), and interpret the pedagogical consequences of *The Structure of Scientific Revolutions* in light of the relationship among science, technology and society established by grant institutions – many of which would come to house prominent STS programs.

challenges; but that, for all the progress of the past quarter century ... the insights we have gained still seem, too often, to be almost wantonly disregarded ... Perhaps the next phase of STS must be a more urgent concern for communication and translation: for making “real” its true potential (Edge 1995 4, original emphasis)

The historical landscape of STS is but a province of 1960’s radicalism. On the received view of STS history, after World War II, runaway science and technology, absent an understanding of social place and obligation, needed a conscience; a sense of humanness; a sense of values. Just three centuries old, modern science lacked what STS would provide “... the ‘new’ view of science and technology as essentially and irredeemably human (and hence social) enterprises – both in the context that nourishes, supports and directs them and their inner character.” (Edge 1995, 5) In accord with Edge’s distracting anthropomorphism, science can be portrayed as a Pigetian child and society as the nurturing parents. Entering early adolescence, science neither possessed the ability to self-reflect nor to render moral judgments. Society required a set of values for mature relationships with other institutions. Science had already begun to construct an identity, supplied by positivist philosophers, but the result was a one-dimensional personality.

Cutcliffe (1990), Fuller and Raman (1991), Edge (1995), and Bowden (1995) tell comparable stories with the appropriate didactic twist. Essentially, STS is a cultural product of the 1960’s. Cutcliffe (1989) and Cutcliffe and Goldman (1988) argue that “in large part” STS arose from doubts about the “beneficence” of science and technology. C.P. Snow’s 1959 Rede Lecture at Notre Dame is seen as the precursor to questions about the education of members who occupied the mutually exclusive culture of science and the humanities (see Edge 1995, 8; Cutcliffe 1990, 362; Bowden 1995, 70). To bring humanists’ wisdom to reconceived techno-social problems was seen as the goal of the “values education” of scientists and engineers. The work of scholars such as Derek de Solla Price (1963), Jacques Ellul (1964) and Lewis Mumford (1967-70) combined with popular critics such as Rachel Carson (1962), Ralph Nader (1965), and Alvin Toffler (1970) signaled the origins of a modern critical consciousness regarding the social effects of science and technology. Interestingly, Cutcliffe (1990), appealing to a form of inevitable intellectual progress, comments that STS has moved away from unreflective Luddism to more contextually sensitive renderings of the history of technology as seen in the evolution of STS coursework.²⁸ However, the raised consciousness of the new left – exemplified by the study of

²⁸ Cutcliffe (1990, 368) cites Staudenmaier (1985) in defining contextual historical approaches to technology. Staudenmaier claims: “Genuine contextualism is rooted in the proposition that technical designs cannot be meaningfully interpreted in their abstraction from their human context. The human fabric is not simply an envelope around culturally neutral artifact. The values and world views, the intelligence and stupidity, the

science and technology “in context” – reveals only the nature of the cultural activity of academia, not a larger social movement.

The intellectual impact of the American “new left”, where Cutcliffe locates the intellectual origins of STS, does not hold up under historical scrutiny. As Russell Jacoby (1987, 114-115) notes, American intellectuals like Carson and Nader played small roles but were certainly not of the stature of Camus, Marcuse or Sartre. Jacoby points to another interesting cultural phenomenon that affected the trajectory of STS: “Never before in American history did so many left intellectuals seek and find university positions. Radicals of the early part of the century almost never became college teachers” (124). In the land-grant setting, counter-culture reaction to science and technology was co-opted as the “curriculum of affect.” Personal reactions substituted for sustained, organized critique: “... the counter-culturalists favor interdisciplinary liberal studies with the nets down; with maximum emphasis on the extra-rationalistic, extra-scientific faculties or potentialities of man. This means a strong emphasis on the instinctual, the intuitive, and the mystical ...” (Goldberg 148) The material extension of the extra-rational (or moral) practitioner is present in both the interdisciplinary and reflexive movement in STS.²⁹

Grown in the post-World War II hothouse of anti-scientism and Luddism, STS became an instrument for the values education of science and technology. However, STS was positioned uneasily as a part of, but apart from, science and technology. While struggling to establish its own identity, STS sought to characterize the reciprocal relationship of science, technology and society. The means for observing and describing this relationship, appropriated from the social

bias and vested interests of those who design, accept and maintain a technology are embedded in the technology itself ... It is no small matter for a group of scholars to attempt the creation of any really new historical paradigm, and indeed our common though often unreflective heritage of the Western progress ideology renders a genuine contextualism doubly difficult.”

²⁹ Alvin Gouldner's (Peter Berger's *Invitation of Sociology: A Humanistic Perspective*. Harmondsworth: Pelican, 1966 and Berger and Luckmann *The Social Construction of Reality: A Treatise in the Sociology of Knowledge*. Harmondsworth: Penguin, 1966 stands as other examples) famous biographical epilogue at the end of the *Coming Crisis in Western Sociology* (1970) illustrates the humanist turn in the attempt to situate individual “extra-moral” reasoning within a disciplinary context: “... the pressure to situate social objects in term of their moral value abides and shapes the work of social theorists, whatever their professed conception of their technical role.” (485) Thus “... the historical mission of a Reflexive Sociology would be to transform the sociologist, to penetrate deeply into his daily life and work, enriching them with new sensitivities, and to raise the sociologists' self-awareness to a new historical level ... the question he [the sociologist] must confront, therefore, is not merely how to work, but how to live” (489) Bennett Berger (*The Survival of a Counterculture: Ideological Work and Daily Life Among Rural Communards*. Berkeley and Los Angeles: University of California Press, 1981) amplifies Gouldner's sentiment: “Reflexivity requires an ‘I’ and no apologies are needed (220-221, 236-239) Wacquant (Pierre Bordieu and Loïac J.D. Wacquant *An Invitation to Reflexive Sociology*. Chicago: University of Chicago Press, 1992) notes that this “...quasi-messianic, existential transformation gives way to a kind of epistemic communalism ...” (28) as Gouldner extends the notion of “professional colleagues” to refer to the subject of sociological study.

sciences, were undeveloped imitations of science itself.³⁰ In the received view of STS, the democratic presumption is that science and technology are closed off to public involvement given various institutional boundaries and is, hence, anti-democratic.³¹ However, the democratic presumption of the Morrill Act is that the land-grant university is open to the public (at least in relation to 19th century European higher education).

The 1970's New Humanities Movement, which advocated bringing human values education to science and technology, was based on the idea that individuals could transcend contemporary history, under the proper material conditions, and render moral judgments.³² Alliances between the liberal arts and the human (social) sciences provided comprehensive recognition, and solution, of given social problems. To insure their survival within the land-grant institutions, the liberal arts and social sciences could now demonstrate their instrumental worth by putting a human face on scientific and technical problems. Moreover, the New Humanities Movement helped promote the democratic, boot-strap image of American laborers seeking to "better themselves." In 1971, the Commission on Arts and Sciences of the National Association of State Universities and Land-Grant College recommended that liberal arts programs stress "humanitarian attitudes" on behalf of the students by examining issues of freedom and human values. In analyzing scientific and technological controversies (e.g., population control, pollution) the commission called for students to have "... a thorough understanding of the sociological, psychological and political implications of the solutions of

³⁰ Edge mentions the sociology of scientific knowledge (SSK) as being a "parallel" and "largely independent" development from the emphasis on science, technology and economic policy evident in the mid-1960's. The current efficacy of SSK to STS can be questioned from Fuller's (1993) account of the function of rhetoric in STS as "... helping disparately interested parties over come their language difference in order to join in common cause." (19) One role of the social epistemologist is to employ rhetoric to determine the appropriateness of norms by the parties affected by them. That SSK has run its rhetorically, hence epistemically, effective course may be a conclusion drawn from the fallout of the Sokal Hoax and the so-called "science wars." More interesting, perhaps, is the cultural origin of SSK in Britain in relation to the science and technology practiced at land-grant universities.

³¹ Not to be confused with Steve Fuller's (*Philosophy, Rhetoric and the End of Knowledge: The Coming of Science and Technology Studies*. Madison, University of Wisconsin Press, 1993) "Democratic Presumption": "The fact that science can be studied scientifically by people who are themselves not credentialed in the science they study suggests that science can be scrutinized and evaluated by an appropriately informed lay public" (25). Implied in Fuller's equation is that STS practitioners roughly equal an informed lay public; hence, any interested party can be a science critic. Fuller's idealized formula ignores some harsh social truths regarding the differences between trained intellectual and the lay public. The purpose of Fuller's appeal to the democratic presumption in order to "motivate the alliance between rhetoric and STS" (24) and to invite scientists to situate their work to in the arena of the "knowledge policymaker." Like other postmodern strategies to democratize knowledge distribution, Fuller's "presumption" turns on an empirical claim not in evidence. Seemingly, once modernist categories are said to be deconstructed (establishing, in this case, that public equals policymaker), traditional hierarchies and categories fall away, and new epistemic relationships avail themselves. However, these empirical relationships can be theoretically maintained by shifting to opposing levels of abstraction. The social sciences and rhetoric, in Fuller's case, are substituted for the natural sciences and philosophy.

³² The new Humanities Movement embodies the same form of liberal democratic individualism found in the "new humanism" of Arnold and Huxley.

environmental problems ... a deeper concern and clearer understanding ... of the relationship between pollution and their own value systems [by] expanding the parameters investigated to include sociological and humanistic values.” The promissory note written by the liberal arts and social sciences in the land-grant system was to collaborate with scientists and engineers in order to “humanize” materialism. As a result, institutional support of the liberal arts was made contingent on showing relevant service to science and technology. During the New Humanities Movement interdisciplinary alliances were “directed toward socioethical action.” (Goldberg 145). Still, questions remained as to whether the liberal arts disciplines needed autonomy to serve adequately:

The tendency toward subservience on the part of the liberal arts is no new phenomenon. Together with the separatist attitude that the liberal arts hold a monopoly on the human values concerns of higher education, this tendency has long inhibited the healthy expansion of the liberal arts at the interfaces with other academic sectors. If interdisciplinary alliances are to be formed between the liberal arts and other fields of study, the liberal arts must retain essential autonomy and integrity, and must enjoy parity of participative weight, of fiscal support, facilities, and organizational status. (144-145)

The success of the dialectic between liberal arts and science and technology, Goldberg asserts, can be found:

... in the very wording of the Morrill Act itself ... “the liberal and practical education of the industrial classes in the several pursuits and professions in life ... without excluding the classics” ... “Without excluding the classics” is at best a permissive phrase, at worst a sop. So far as the liberal arts within the land-grant matrix are concerned, it could lead to disciplinary and budgetary tokenism and the relegation of these studies, in spite of rhetoric about the democracy of the disciplines, to second-class academic citizenship (157-158).

Goldberg’s gloomy prediction for land-grant and public universities comes to pass a decade later. However, Fuller’s (1993) rather rose-colored interpretation of the interdisciplinary movement (produced while in residence at a land-grant institution) reveals the blindness of ideology.³³ “The increasingly strategic roles that deans, provosts, and other trans-departmental university administrators play in shaping the future of departments testify to

³³ Fuller describes his position as follows: “Interdisciplinarity can be understood as either a fact or an ideology ... I endorse both ... I am an ideologue of Interdisciplinarity because I believe that ... academic disciplines follow trajectories that isolate them from one another and from the most interesting intellectual and social issues of our time” (33).

this general tendency to assimilate the problem of interdisciplinarity negotiation to the general problem of knowledge policy.” (34) The “problem of knowledge policy” is that of determining the role of knowledge production in a democratic society. The “problem of interdisciplinarity” is that of determining the use of disciplinary resources in solving public-interest problems. The ideology of interdisciplinarity, as a sweetener for fiduciary bitter pills, has not been lost on land-grant university administrators. Humanists’ commitment to the inherent democratic ethos of interdisciplinarity make administrators’ demands that liberal arts disciplines reorganize, for whatever reasons, easier to sell. In the land-grant system, the unintended consequence of Fuller’s brand of interdisciplinary ideology is to paint the liberal arts and social sciences into a rhetorical corner. The consequence of a democratic ethos is to subscribe to the will of the people – even if that will is for increased professional training (as is the current vogue). Since the humanities and social sciences, for the most part, cannot easily legitimate their presence according to the land-grant charter (i.e., liberal and practical education “without excluding the classics”) they must create alliances with the natural sciences and engineering. As a result, the humanities and social sciences become ever more efficient servants for scientists and engineers.

2.5 Peripatetic Administrators

Forced by political exigence during state budgetary crises in the 1980’s, and inspired by corporate *trompe l’oeil* strategies for obscuring malfeasance, state politicians saw Morrill Act colleges and universities as a proving ground for the private sector reform of public institutions. State politicians manipulated taxpayer outrage over inefficient government by leveling attacks on education cash cows. Consumer friendly approaches to public institutions were advocated. New burdens were placed on university administrators and instructors to respond to customer demands. As a result, administrators were forced to re-examine the basic mission of these institutions.

The traditional mission of academic administrators, department chairs, deans, provosts – even presidents, was to ensure the success of preserving, creating and transmitting knowledge. Over the last three decades, a class of university administrators, who move from university to university, and one position of power or prestige to a greater position of power and prestige, has evolved. As their charge, these administrators must appease taxpayer demands

by explaining the practical implications of academic research and demonstrating that universities could be run like efficient industrial engines.³⁴

A sketch of what Joseph Pitt calls the “peripatetic administrator” is “... the faculty member who leaves university A to become a department head at university B ... to become a dean at University C, a provost at university D, a president at university E and then president at university F, which is a better university than university E.”³⁵ Pitt divides peripatetic administrators into two groups: 1) administrators who see their current job merely as a stepping stone to the next position, and 2) administrators who “... move to the next university primarily as the chance to make another blow in favor of their own ideology ...” While the relative sociological merits of Pitt’s nomenclature can be questioned, academic administration has clearly become a career in itself. The problem of such a career path, Pitt argues, is the absence of concern for the historical uniqueness of a given institution in favor of a short term solution to embellish a vita. A current favorite short-term solution is realizing cost-effective methods for administering weak revenue generating programs in the humanities and social sciences. The solution takes the form of founding interdisciplinary or “studies” programs or “centers.” Under threat of extinction these programs are stitched together. Consequently, a new understanding of an issue through an interdisciplinary approach comes as a fortunate happenstance, not an envisioned goal.

The weak boundaries surrounding humanities and the social science disciplines make them irresistible targets for administrators eager to emulate corporate restructuring policies. Interdisciplinarity, substituting as an opportunistic expression for forced collaboration, becomes a creative solution to addressing humanistic and social scientific inquiry with fewer resources. While interdisciplinary advocates may trumpet the ends of academic downsizing, the restructuring of academic disciplines, the means, eliminating resources and labor, and the unintended consequences, diluting and reordering the goals of Science and Technology Studies, can be cruel.

One of the presumptions of Science and Technology Studies is that “interdisciplinary exchanges have the potential for significantly transforming the work that disciplines do by constructing new epistemic standards to which several disciplines agree to hold themselves

³⁴ Hazard Adams’ remembrances of his participation in academic administration (*The Academic Tribes* 2nd ed. Chicago: University of Illinois Press, 1988.) ends: “... as history tells us, in a renaissance power devolves on the strong, the intelligent, and the learned and on those, I would, who can articulate a definition of their worth, at least to themselves and maybe even to those quite shrewd legislators from Dime Box, Opportunity, Wagon Tire, and American Fork” (185).

³⁵ “On the Idea Of the University” unpublished manuscript presented September 14, 1995 at the Science and Technology Studies seminar series at Virginia Tech.

accountable" (see Fuller 1993, xi-xxii). Fuller claims that administrators, given their free-floating status, would translate internecine disciplinary battles into broader questions of knowledge policy. One role for the science studies practitioner, then, would be as a knowledge policy maker. The "problem" of knowledge policy, the process of explaining and assessing how knowledge is produced by experts and distributed to nonexperts, is fundamentally rhetorical. Fuller goes on to argue that questions of knowledge policy are neither resolved by showing how, through technological byproducts, scientific research is relevant, nor by insisting the public become scientifically literate. But products are not policies.

The epistemic products of any one discipline are generated by different processes which, in turn, are governed by different policies. In the land-grant setting, the appropriate model for interdisciplinary integration is corporate mergers and acquisitions. For the "trans-departmental" administrator the task is not to "assimilate interdisciplinarity negotiation to knowledge policy" rather to assimilate department structure to knowledge products. Here, Fuller (1993) assumes preconditions in which equitable negotiation takes place on a level rhetorical playing field:

The rhetoric of interpenetrability aims to recast disciplinary boundaries as artificial barriers to the transaction of knowledge claims. Such boundaries are necessary evils that become more evil the more they are perceived as necessary. The rhetoric that I urge works by showing that one discipline already takes for granted a position that contradicts, challenges or in some way overlaps the position taken by another discipline. As a dialectical device, interpenetrability goes against the grain of the current division of academic labor, which typically gives the impression that issues resolved in one discipline leave untouched the fate of cognate issues in other disciplines (36).

The subtext, of course, is that the sciences jealously guard their disciplinary boundaries and in so doing remain unaware of similar research done in cognate areas in other disciplines. Clearly, as Fuller argues, this organization of cognitive labor in academia is inefficient. But just as Fuller sees academic disciplines (ostensibly) engaged in a common enterprise, the peripatetic administrator sees a loose affiliation of corporate enterprises which taxpayers allow to peacefully co-exist peacefully until public finances dictate otherwise. While questions of knowledge policy may not be solved by technological artifacts, the social contract struck by the Morrill Act promised to deliver material applications to 19th and 20th century American

citizens.³⁶ STS, in the American land-grant university, either acknowledges this reality and survives, or is consigned to the dustbin of interdisciplinary downsizing.

2.6 Conclusions

The first Morrill Act, passed in 1862, established state patronage for science and technology. American STS is rooted in the land-grant universities created by the Morrill Act. Traditionally celebrated as a successful experiment in democratizing higher education, the Morrill Act was, perhaps more importantly, an instrument for raising state revenue and formalizing agricultural, economic, military, scientific and technological interests. In place by the time of American reconstruction, the Morrill Act prefigured the social contract, and the required justification, for supporting scientific and technological research. An education “without excluding the classics” reflects the assumption that the science and technology contain and will display, in the proper setting, the liberal democratic ethos – once thought humanism’s exclusive domain. However, in the century after the Morrill Act’s passage, a more sophisticated form of values education was needed to answer public concerns over runaway scientific and technological progress. Enter STS.

Given its origin, purpose, and continued presence in land-grant universities, STS acts as a rhetorical steam valve which helps dissipate public pressure on science and technology. In response to the popular critics of the 1960’s, STS was an institutional response to the concern that student practitioners were not receiving needed values education. Within academia, one must wonder why a seemingly radical idea like interdisciplinarity, whose ultimate goal is eliminating traditional disciplinary structures, would gain fairly widespread currency within land-grant institutions. Whose interests are being served? As an interdisciplinary enterprise, STS unintentionally supported the goal of administrators to provide cost-effective course offerings which mimicked a democratic ethos. Further, in a time of budgetary constraints, interdisciplinarity became a tool for restructuring humanities and social science disciplines, and was rewarded as a savvy career move for peripatetic administrators.

³⁶ The parallel between the Restoration “polity of science” described by Steven Shapin and Simon Schaffer (*Leviathan and the Air-Pump: Hobbes, Boyle, and the Experimental Life* Princeton: Princeton University Press, 1985, 332-344) and the polity of the American reconstruction is particularly apt. While one may not draw the same philosophical conclusions as Shapin and Schaffer, just how well the form of knowledge STS knowledge corresponds to the real nature of science is, like the relationship of liberal rhetoric and the real nature of society, increasingly in doubt: “We find ourselves standing against much current sentiment ... that we have transcended such outmoded categories. Far from it; we have not yet begun to understand the issues involved” (342).