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Why Do Universities Patent? The Role of the Federal Government in Creating Modern Technology Transfer Practice

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ABSTRACT Academic science, once relatively insulated from market forces, has seen the Mertonian ideal of communistic science partially displaced by an argument that science, in order to be fully applied, must often be privately owned. In keeping with this logic, universities have been patenting faculty inventions in increasing numbers for the last several decades. Much of this increase has traditionally been attributed to the Bayh-Dole Act of 1980, which gave universities an explicit legal mandate to commercialize federally-funded research through patenting. But recent research shows that university patenting was on the rise well before the Bayh-Dole Act and argues that the Act's impact was not as large as has generally been assumed. This paper claims that state actors were nonetheless critical in creating modern technology transfer practice in universities. I suggest we see the Bayh-Dole Act as the culmination of a larger project of patent policy liberalization that was driven by federal administrators. This project played a significant role in encouraging university patenting through innovative administrative mechanisms and the support of an emerging community of university patent administrators in the late 1960s and early 1970s. Once established, that community in turn allied itself with federal proponents of legislation in the late 1970s in a successful effort to pass Bayh-Dole. Thus the passage of the Act can be seen not as creating modern technology transfer, but as institutionalizing an already-established university patenting community, itself partially a government creation.

In recent years, many scholars have become interested in how market forces have affected the American research university at the macro (Geiger, 2004; Slaughter & Rhoades, 2004), meso (Etzkowitz, 2002), and micro (Kleinman, 2003) levels. The enthusiastic adoption by universities of the practice of patenting and licensing faculty research is one of the most significant ways in which universities have entered the marketplace. Once considered inappropriate by many, who saw such patenting as transferring a public good into private hands, today the practice is widely accepted and encouraged on the basis that the private ownership of scientific inventions is often a necessary prerequisite of their development into useful products. Substantial work has been done on how universities' patent practices have changed and to what effect (Feldman & Desrochers, 2004; Henderson et al., 1998; Mowery et al., 2001, 2004; Owen-Smith & Powell, 2001, 2003; Thursby & Thursby, 2002), but the question of why university patenting increased in the first place has not been fully answered.

The easy answer is, because of the Bayh-Dole Act (formally the *Patent and Trademark Law Amendments Act*, P.L. 96-517): the 1980 legislation that made it easier for universities to patent government-funded inventions and that encouraged them to do so.¹ But this is problematic for two reasons. First, David Mowery and his colleagues have recently shown that university patenting was on the rise well before Bayh-Dole (Mowery & Sampat, 2001b), and that Bayh-Dole alone cannot explain the post-1980 rise in university patenting (Mowery et al., 2001, 2004; Mowery & Ziedonis, 2000, 2002). This leads us to ask what else was causing university patenting to increase, particularly prior to the Bayh-Dole Act. Second, it still leaves us with the question of why the Bayh-Dole Act became law. The interest groups responsible for the Bayh-Dole Act are rarely discussed.

This paper begins to answer some of those questions. In 1968, about 100 patents were issued to universities. By 1980, that number had increased to about 350, and by 1992 it was on the order of 1400 (Association of University Technology Managers, 2004; Henderson et al., 1998; Mowery et al., 2004; Mowery & Sampat, 2001b).² So the number of patents issued to universities increased almost as rapidly in the twelve years leading up to Bayh-Dole (by about 250%) as it did in the twelve years following the Act (about 300%). Patents issued per research dollar spent also increased rapidly in the years leading up to as well as the years following Bayh-Dole (Henderson et al., 1998: 120; Mowery et al., 2004: 48). This occurred despite norms in the scientific community during the 1970s that still largely opposed patenting scientific research on the grounds that academic science should be publicly available, not privately owned by universities or anyone else (see, e.g., Hughes, 2001).

I suggest that while the causes of the pre-1980 rise in university patenting and the passage of the Bayh-Dole Act are complex, we are better served by beginning our story with the state rather than universities or industry, and offer an alternative narrative that emphasizes the interplay between state and university actors both in encouraging university patenting prior to Bayh-Dole and in securing passage of the Act itself. The 1970s saw the development of two overlapping but distinct social networks that helped transform university patenting. One was made up of federal administrators who believed that inventors in general should retain patent rights to government-funded research, and who worked in several ways to make that possible. The other was a community of university patent administrators who believed that universities could and should be pursuing patents on their inventions and shared knowledge among themselves on how to do so, as well as working with government to change policy. These networks emerged at about the same time, in part because of the work of one very committed

National Institutes of Health (NIH) administrator who was critical to the development of both. Early on, the efforts of federal administrators helped a university patenting community to develop. But once that community was independently established, it proved critical in making the administrators' stymied project of rewriting federal patent policy a reality. Ultimately, it was the interaction *between* federal employees and university administrators that both caused university patenting to increase during the 1970s and that made the passage of Bayh-Dole possible in 1980.

Literature Review and Data

The transformation of university patent practices interests scholars for two reasons. One is because it is a kind of privatization: something that was once solely a public good—federally-funded science—has become privately owned and profited from. Thus it is an example of the expansion of market forces into areas that were previously insulated from them. The second is because the patenting and licensing of university inventions is an important means of technology transfer—that is, it facilitates the movement of technology created in one environment (universities) to its application in another environment (business). So understanding it can help us better understand the economic impact of science.

The privatization of the university has been explored in a number of books recently (e.g. Bok, 2003; Geiger, 2004; Kirp, 2003; Newman, 2003; Washburn, 2005), though they do not deal extensively with university patenting. Two primary bodies of research work toward theorizing this changing relationship between universities and the marketplace. One describes a 'triple helix' model of innovation, in which patterns of interaction between universities, industry, and government gradually reorganize the institutions that form these relationships (Etzkowitz &

Leydesdorff, 1997; 2000). This model foregrounds the university over industry or the state as playing the leading role in innovation (Etzkowitz & Leydesdorff, 2000: 109). But it points us toward the interrelationship between universities, industry, and government as a starting point for understanding ‘entrepreneurial science’ (Etzkowitz, 2002), though it does not suggest an answer to the question of why university patenting practices in particular changed. Insofar as my account focuses on the interaction between state and university actors in changing the institution of patenting, it is compatible with this approach, and perhaps brings a greater level of empirical detail to this theory’s account of the way in which such relationships can eventually change the actors themselves.

The other theoretical model advanced recently is that of ‘academic capitalism’ (Slaughter, 1990; Slaughter & Leslie, 1997; Slaughter & Rhoades, 2004). Drawing on a diverse set of ideas from Foucault to post-Marxism to resource dependence, it attributes changes in the university first to the actions of universities themselves, which use ‘a variety of state resources to create new circuits of knowledge that link higher education institutions to the new economy’ (Slaughter & Rhoades, 2004: 1). This approach would suggest that we look for the rise of university patenting in the entrepreneurial action of universities or in their efforts to manage resource dependencies. While that is certainly part of this story, my account may credit state actors with having more impact on university patent practices than the academic capitalist theory might suggest.

The subject of technology transfer in universities has spawned its own large body of research, most of it written by economists (e.g. Henderson et al., 1998; Jensen & Thursby, 2001; Thursby & Thursby, 2002; but also see Feldman & Desrochers, 2004; Owen-Smith & Powell, 2001, 2003; see Bozeman, 2000 for a thorough if now slightly dated review of this literature).

Of this work, that of Mowery, Sampat, and colleagues deals most directly with the question of why university patent practices began to change. Drawing on both quantitative and qualitative historical data, Mowery & Sampat document the pre-Bayh-Dole increase in university patenting and suggest several potential explanations for it: 1) the growth in federal support for research and its distribution to a wider range of universities increased the total number of inventions being made and thus would have led to more patents even if inventions were being patented at the same rate, 2) funding growth was particularly large for biomedical research, a field which may have produced more patentable inventions, 3) Research Corporation, a nonprofit organization which had managed patents on behalf of many universities, began training universities in patent administration, thus encouraging them to patent more frequently, 4) the creation by NIH, the National Science Foundation (NSF), and the Department of Defense of administrative mechanisms to make patenting—at the time bureaucratically complex—simpler for universities, and 5) the development at Stanford of a new model of managing university patents focused on actively identifying and marketing inventions rather than on passive legal administration of patents (Mowery et al., 2004; Mowery & Sampat, 2001a, 2001b). They highlight the evaluation of the relative impact of these factors as ‘an important task for future research’ (Mowery & Sampat, 2001b: 807). This work furthers that goal by providing a narrative focused on the role of federal administrators and their interaction with an emerging community of university patent administrators in encouraging university patenting as well leading to the Bayh-Dole Act.

The paper is based primarily on qualitative historical research, particularly Congressional hearings, government reports, science coverage in popular and professional media, and the publications of relevant professional groups. This research was supplemented with seventeen interviews of people involved with university patenting or the policymaking process. It also

draws on the personal records of Norman Latker, former NIH patent counsel. These records include internal NIH documents, unpublished reports on federal patent policy, and related correspondence, and have not been used before in academic work. NSF data on federal funding for science have been used for descriptive statistics.

University Patenting and the Federal Policy Context, World War II to the 1960s

No discussion of changing university patent practices can take place outside the context of federal patent policy. When the federal government became the primary patron of academic science in the United States in the years following World War II, it also became the primary funder of university inventions.³ Thus federal patent policy, which decides who retains the ownership rights to government-funded inventions and how those rights can be used, has long set the boundaries for what university patent practices are possible.

The debate over what federal patent policy should look like is equally longstanding.⁴ Two main possibilities were discussed in the years following the war: a government-title policy and a government-license policy. A government-title policy would, by default, give the federal government title to all government-funded inventions. The main argument in favor of this policy was that what the public funds, the public should own: i.e., that publicly-funded research should remain in the public domain whenever possible, accessible to all, but that if it must be patented for some reason, the patents should be owned by the government and used in the public interest. Under such a policy, if a university scientist used a federal grant to invent a better hearing aid, that scientist would have to disclose the invention to the government, which would then decide whether to publish the invention or patent it itself. The scientist and the university would have no further rights. A government-license policy, by contrast, would keep invention rights with the

inventor's organization. The government would only reserve the option of a royalty-free nonexclusive license for itself so the invention could still be used for public purposes if needed. In this case, the university and the scientist would decide whether or not to patent the new hearing aid. Proponents of a government-license policy argued that giving the government ownership of publicly-funded research was actually not in the public interest: the government was not well-equipped to manage patents or encourage the development of inventions, and the invention would be more likely to actually get into use if the inventor maintained control of it.

After the war, several efforts were made to create a comprehensive federal patent policy that would have legislated one of these options or some compromise between them. But no group was strong enough to push a uniform federal patent policy into legislation. As a result, individual science funding agencies developed their own patent policies, some through statute and some through regulation. Different agencies had different concerns about patenting that reflected their organizational histories. The Atomic Energy Commission (AEC), for example, with its roots in the Manhattan Project, was very concerned with its ability to control research results, and retained title to almost everything. The Department of Defense, on the other hand, despite having an obvious interest in secrecy, generally left invention rights to contractors. NIH developed a policy of generally maintaining title to inventions but would sometimes waive title upon request, with the caveat that patent holders could only license inventions on a nonexclusive basis (U.S. Department of Justice, 1947; U.S. Senate Select Committee on Small Business, 1959). By the end of the 1950s, an extremely complex and varied federal patent policy had evolved, complicated by the fact that any inventions that had received funding from more than one federal agency—a common situation—would need to reconcile multiple policies. The Bayh-

Dole Act would eventually supersede twenty-two different federal statutes governing some aspect of patent policy (P.L. 96-517: 35 U.S.C. 210).

This regulatory framework served to limit university patenting. While universities were not very active patenters during the 1940s and 1950s (Mowery & Sampat, 2001b), most major schools had formal patent policies as early as 1948 (Palmer, 1948). So universities were not completely unaware of the possibility of patenting their research. But negotiating the bureaucratic complexity of federal patent policy required a knowledgeable advocate, and as few universities had an administrator devoted to patenting, that complexity effectively discouraged the patenting of government-funded research.

This situation remained static into the 1960s. Universities occasionally patented inventions, but patenting remained infrequent. There was little uniformity in universities' administration of patents: some used outside organizations like Research Corporation to take care of patents; others had external foundations like WARF, the Wisconsin Alumni Research Foundation; a few, like the University of California, employed a patent attorney; yet others gave the responsibility to a faculty committee.⁵ In many places, patenting was so uncommon that no one was responsible for it.

Not surprisingly, there was no professional community of 'patent administrators'. Howard Bremer, longtime patent counsel for WARF, which had what was then the most active patenting program, describes the 1960s as being a period of relative isolation.⁶ He was only in regular contact with the University of California, Iowa State, Research Corporation, and Battelle Development Corporation: 'About every eighteen months to two years we'd get together and just, in some hotel...discuss happenings and see what developments there were' (Bremer, 2001:

50).⁷ No professional association existed, and until the 1970s even informal social networks were limited.⁸

But while universities were still mostly indifferent to patenting in the 1960s, federal patent policy was regaining attention on Capitol Hill, where between 1959 and 1965 a series of Congressional hearings were held on the issue (U.S. Senate Committee on the Judiciary, 1960, 1961, 1965; U.S. Senate Select Committee on Small Business, 1959, 1960, 1963). Senator Russell Long (D-LA), chairman of the Select Committee on Small Business Committee's Subcommittee on Monopoly, repeatedly introduced legislation to establish a strong and comprehensive government-title patent policy, but though his voice was loud, in 1963 the Kennedy administration reiterated the existing policy of administering patents differently in different agencies ('Memorandum & Statement of Government Patent Policy', 1963). And by 1965 the debate was essentially in the same place it had been after the war: the Senate Judiciary Committee found itself debating three comprehensive patent policy bills, one proposing a government-title policy, one a government-license policy, and one a policy that would vary from agency to agency (U.S. Senate Committee on the Judiciary, 1965).

Any of these bills would have applied to universities, but they were not aimed at universities. Federal patent policy, after all, applies not only to universities receiving government grants, but to all federal R&D contracts, most of which are held by large for-profit companies; less than 10% of all federal R&D spending was going to universities in the 1950s and 1960s (National Science Foundation, 2002: Table 8). University research funding, however, came disproportionately from certain federal agencies, and it was changes in those agencies, beginning with NIH, that would first begin to affect university patent practices.

Though the Department of Defense was the largest government funder of university science in the 1950s, by 1960 the Department of Health, Education, and Welfare (HEW), which housed NIH, had outpaced it. That lead would continue to grow until 1974, at which point 55% of federal research funding for universities came from HEW (Table 1). The large majority of HEW research spending at universities was NIH spending. And in the early 1960s NIH was having patent policy problems of its own.

(Insert Table 1 about here.)

HEW was one of the federal agencies that had a good deal of discretion over administration of patent rights. While by default NIH-funded inventions belonged to the government, the agency could choose to waive its rights to contractors or grantees under circumstances where doing so would be in the public interest (Latker, 1978: 3-7). The agency did not employ anyone with patent expertise during the 1950s, however, and its internal patent policy was incoherent at best. At the same time, however, it was growing literally exponentially: NIH's Congressional appropriations increased from \$48 million in 1953 to \$737 million in 1963 (National Institutes of Health, 2005a, 2005b). Not surprisingly, the research it funded was resulting in increasing numbers of inventions. By 1962 the Director of the National Cancer Institute was arguing internally that the agency's patent policy was ill-considered and required a major overhaul (Endicott, 1962). To address these issues, NIH took a step in 1963 that would have long-term consequences on university patenting. It decided to hire a patent attorney to come sort things out, and it chose for the job a young man then working for the Air Force named Norman Latker.

The changes Norman Latker pushed HEW to make to its patent policy during the 1960s would, in the long run, be critical both to increasing university patenting directly and ultimately to passing the Bayh-Dole Act. At the beginning of this paper, I suggested that both of these changes were driven by the efforts of two distinct but connected social networks. One was a group of federal administrators who wanted broad changes in government patent policy that would affect all government contractors and grantees, Boeing and Lockheed Corporation as well as Stanford and MIT. The other was a group of university patent administrators who were beginning to think of themselves as a professional community and who wanted government to make it easier for universities to pursue patenting.

Latker spent his first five years at HEW working to establish an administrative mechanism that would encourage university patenting of NIH-funded research. In 1968, such a mechanism became a reality: HEW approved institutional patent agreements (IPAs), contracts that allowed approved universities to retain patent rights to any HEW-funded research. In the process, Latker played an important early role in creating a university patenting community. He wrote IPAs in a way that required universities to designate a specific individual to be responsible for patenting, and then helped connect these individuals, who all necessarily knew him, to one another. By the time the first conference of university patent administrators was held in 1974, the community had reached cohesion, and while Latker retained close ties to it, his role in holding it together was no longer critical; it had taken on a life of its own.

The success of IPAs led Latker to turn much of his attention outside of HEW in the early 1970s, as he began to work with other federal administrators devoted to the broad transformation of government patent policy through administrative, regulatory, and legislative means. A small group of supporters coalesced around the issue. They made slow progress, including convincing

NSF to adopt institutional patent agreements, but by about 1977 it had become clear that 1) major legislation would be needed to change government patent policy to the extent they wanted, and 2) no legislation was likely to be forthcoming if it applied to big federal contractors too. At this point, the federal administrators made a strategic decision. They decided to push for legislation that would create a comprehensive government-license policy, but only for universities, other nonprofits, and small businesses.

Here the new university patenting community, the creation of which had been facilitated by NIH and NSF, was pulled into the legislative process. Its members helped sign on Senator Birch Bayh (D-IN), a Democrat who would not have supported a government-license bill that covered big business too, as a sponsor, and converted one-time opponents like Senator Gaylord Nelson (D-WI) into cosponsors. The federal administrators contributed other kinds of resources, including getting small business involved in lobbying for the bill. The efforts of university patent administrators helped them to further cohere as a community, as for the first time they went beyond giving one another guidance and support to working on a major collective project. In December 1980 these efforts paid off when the Bayh-Dole Act was signed into law. The rest of this paper analyzes the long road that led to this point: first, the encouragement by HEW of university patenting and the subsequent development of a community of university patent administrators; second, the growth of a small network of federal employees committed to broad change in government patent policy and their limited success; and third, the aligning of these two groups into a force strong enough to get the Bayh-Dole Act passed.

IPAs and the Development of a University Patenting Community

The post-1968 increase in patenting by universities and the concurrent development of a community of university patent administrators can at least partially be traced to the creation of institutional patent agreements at HEW. Before Bayh-Dole, the government maintained title to the inventions of NIH grantees and contractors by default. But since HEW was one of the federal agencies with a good bit of leeway in interpreting its patent policy regulations, it had always had the option of waiving title to an invention upon the request of the grantee, provided the grantee could show that it had the administrative capacity to pursue the invention's development. A handful of universities with active patent programs—Wisconsin, Purdue, MIT—regularly sought such waivers, but doing so was a significant bureaucratic hurdle, since applying for waivers was complex, could only be done one invention at a time, and success was uncommon anyway.

Institutional patent agreements were a way to cut through this red tape. Under an IPA, HEW would form a contract with a particular university under which it would waive title to all HEW-sponsored inventions that met certain conditions. Then the university could avoid the time-consuming process of applying for individual waivers. Instead, they would only have to apply once, for an IPA. HEW had used IPAs in the 1950s, but the original IPAs were not designed very well, and by the early 1960s had fallen into disuse. When Norman Latker was hired in 1963, he resurrected the idea and set about trying to create a new and better IPA.⁹

Doing so was not a quick and easy process, however. Though Latker had spent his career thus far working for government, he inherently distrusted government's ability to manage inventions that it knew little about and believed that the closer an invention could be kept to its inventor the more likely it was that it would someday be used. Ideally, he would have liked

inventors themselves to retain title to their inventions. But he far preferred that universities patent faculty inventions than Washington.

Latker had not worked with many university inventions before coming to NIH; most of his work for the Air Force involved the inventions of industry contractors. But after arriving and surveying the situation, he quickly made it clear that he believed the department's patent policy was too heavy-handed, and that it should generally waive title to universities upon request as well as permitting exclusive licenses, then completely banned. This view conflicted with actual HEW practice. When universities came to HEW requesting that it waive title to a particular invention, the request would first go to an administrative office that routinely recommended such requests be denied. Then the request would go to Latker for review. Before long Latker began challenging these denials on the basis that the department had no intention of pursuing development of these inventions itself, and thus that the public's interest was not being served by the department's refusal to waive title. This brought him into open opposition to other offices within HEW. Several years of confrontation ensued, during which Latker pushed for more title waivers and others within the department resisted.¹⁰

It was public embarrassment that turned the tide in Latker's favor. Others within NIH had raised similar concerns about HEW's patent policy as early as 1962 (Endicott, 1962; Hiller, 1964; Shannon, 1964). But in 1968, two major studies of federal patent policy were published, both of which singled out NIH's medicinal chemistry program for negative attention (Harbridge House, 1968; U.S. General Accounting Office, 1968).¹¹ This relatively small (about \$8 million annually) grant program funded organic chemists, mostly in universities, to do basic research that produced as a byproduct chemical compounds with potential pharmaceutical applications. Because HEW patent policy did not allow for exclusive licenses, however, no pharmaceutical

companies were willing to participate in the screening of these compounds with an eye toward their eventual development. The development and testing process in the pharmaceutical industry was even then so lengthy, and the costs of copying a drug already on the market so small by comparison, that there was no incentive for drug companies to look at these compounds without the potential for an exclusive license. The result was that these promising compounds were sitting on the shelf gathering dust.

Both the Harbridge House and the GAO reports recommended that HEW modify its patent policy along just the sort of lines that Latker had been suggesting. The widespread publicity they got defused some of the internal opposition to waiving patent rights to NIH-funded inventions, and not only led to more frequent approval of individual waiver requests, but made it possible for Latker to establish a new set of institutional patent agreements. In December 1968, the first batch of IPAs were formed with a dozen institutions; by 1971, thirty-seven universities held IPAs (Latker, 1971: 2).¹²

The reestablishment and active encouragement of IPAs by HEW had a major impact on university patent practices. First, the amount of money HEW spent on university research was large (\$350 million in 1963, when Latker arrived), and rapidly growing (it reached \$677 million in 1968, when IPAs were reestablished, and \$1.2 billion in 1974) (National Science Foundation, 1997: Table B). Not only was HEW the largest federal funder of university research in the 1960s (Table 1), it provided about a third of *all* university R&D spending during the 1960s, including not only federal but state, local, industry, institutional, and other sources (Table 2). HEW dollars—and thus its patent policies—touched a lot of university science, and a lot of university inventions.

(Insert Table 2 about here.)

Second, reestablishing institutional patent agreements did result in universities' patenting and licensing inventions in greater numbers. Between 1969 and 1974, 167 patent applications were filed by universities holding IPAs with HEW, and between 1968 and 1974 162 petitions for waiver of title were granted to universities not holding IPAs (Latker, 1976: 14, 15). No data exist for the period prior to 1968, but evidence suggests that requests for title waivers were generally rejected and that almost no university patents were resulting from NIH-funded research (Bremer, 2001: 157; General Accounting Office, 1968; Harbridge House, 1968; Shannon, 1964; Bayh, 2004: 8). If we estimate that between half and two-thirds of those applications and waiver petitions actually became patents, that would mean that the change in HEW's patent policy made another 35 to 45 patents per year possible. University patenting overall increased from about 100 per year in the 1960s to about 225 per year in the early 1970s (Mowery & Sampat, 2001b: 798). This back-of-the-envelope calculation suggests that roughly a third of the additional university patents during this period were related to changes in HEW policy.

Third, establishing IPAs and increasing university patenting of NIH-funded research supported the development of a community of university patent administrators. By design, before a university could create an IPA it had to make a specific university official responsible for managing patents. At many universities, no such person existed before this. Creating a constituency of people in universities committed to patenting and licensing faculty research was a prerequisite to the growth of a university patenting community. Many of the university officials who were made responsible for administering IPAs in the late 1960s and early 1970s were the same people who would be instrumental in creating the Society of University Patent

Administrators in 1974, and in fighting for Bayh-Dole in the late 1970s. In Latker's words, 'The major part of the institutional agreement was there was an absolute requirement that they identify some office, a person in the office that I could deal with. And frankly, you know, that's how Bayh-Dole got passed.'¹³ Howard Bremer of WARF said, 'Bayh-Dole in effect and the institutional agreements before it really served to establish a new profession. I think it's broadly recognized among the university sector that that's the case' (Bremer, 2001: 77).

Latker also used his structural location to help a network of university patent administrators emerge. In the 1960s and early 1970s most university patent administrators didn't know one another. But they all knew Latker. Many people in the university technology transfer community have acknowledged the important early role he played in helping this community develop. Latker himself explains his role in terms of being uniquely positioned to pass information among disconnected university administrators: 'The thing you have to remember is that there was no Internet at this time....I was the only one that had the central facility, and enough resources to keep everyone together.'¹⁴ Prior to this time, relationships between government agencies and universities around the issue of patenting had been mostly adversarial, but Latker 'was able to gain widespread trust and confidence among academic administrators' (Merrifield, 1984; MacCordy, 1984: 1).

By the early 1970s, the shift in policy at HEW had largely been accomplished. More IPAs were being signed each year, and the department now routinely signed title waivers to university inventions. Latker no longer needed to devote his energies to political battles within the department. Increasingly, he turned his attention toward the other federal science agencies, and began to make allies who supported broader regulatory and legislative change in patent policy.

Federal Administrators and Government Patent Policy Reform

The Congressional debate over government patent policy that took place in the first half of the 1960s did not result in legislation. But it did lead to a presidential memorandum that required the Federal Council for Science & Technology (FCST), an interagency body made up of the heads of the federal agencies concerned with science, to begin collecting data on government patent policy and publishing an annual report to guide policymaking (‘Memorandum & Statement on Government Patent Policy’, 1963). As a result, the FCST created a Committee on Government Patent Policy, which published its first report (including the first data on patents resulting from federal contracts and grants) in 1965 and quickly commissioned a study by consulting group Harbridge House (Federal Council for Science & Technology, 1965). Composed of representatives—primarily patent attorneys—from each of the federal agencies that funded R&D, the Committee on Government Patent Policy represented an new opportunity for regular communication among the people who actually implemented government patent policy for both universities and industry on a day-to-day basis.

It was within the subcommittees of the FCST’s Committee on Government Patent Policy that Latker met a handful of likeminded people working in other federal agencies who began to work on multiple fronts to transform federal patent policy. Though most of the committee members supported a government-title patent policy, a few did not. One of this minority was Jesse Lasken, a patent attorney who had been hired by NSF in 1972 to streamline its own cumbersome patenting process. Lasken, like Latker, believed that universities would do a better job of managing inventions than the government, and when the two met (both served on the University Patent Policy Ad Hoc Subcommittee (Federal Council for Science & Technology,

1972: 203-4)), they quickly formed a partnership. Ever since Latker successfully implemented IPAs at HEW, he had hoped to convince other agencies to adopt the mechanism. Lasken was the first person he met who was interested in doing so, and in 1973, NSF began signing institutional patent agreements modeled closely on the ones at NIH.

This was a significant next step in making it easier for universities to patent federally-sponsored research. NSF was the second-largest funder of university research at this time. With both NIH and NSF on board, 68% of federal research funding at universities could be governed by institutional patent agreements (Table 1). If funding from the Defense Department (which had long had a similar mechanism; see note 6) were included, by 1973 universities with the capacity to manage patents had the option of patenting inventions resulting from almost 80% of federal funds (National Science Foundation, 1997: Table B).

But here things stalled. No other agencies were willing to adopt IPAs. As G. Willard Fornell, patent administrator for the University of Minnesota, put it in 1974,

Those of us who are in university patent administration would find our lives quite a bit easier if we could operate under institutional patent agreements across the board. Of course that is really pie in the sky because there are some agencies that are so far from an institutional patent agreement, that I am sure that we, our children, nor our grandchildren will ever see one (National Conference on the Management of University Technology Resources, 1974: 40).

There were, to some extent, philosophical differences among the agencies. But there were other reasons for the reluctance as well. For one thing, some, like NASA, were operating under statutes that allowed less leeway in the disposition of invention rights (Kraemer, 1999).

Bureaucratic inertia certainly played a part in preventing change, as did the defense of turf—

agencies were loath to give up something they controlled, regardless of what it was (Bremer, 2001: 159). Some of the funding agencies employed large numbers of patent attorneys who would have nothing to do if there were no government-owned patents to administer.¹⁵ And the fact that most of the other agencies' research money did not go to universities gave them a different set of policy considerations.

Latker and Lasken, however, believed that the public would be best served by having a government-license patent policy across the board, applying to industry contractors as well as universities and nonprofit grantees. As minority voices, however, they might not have made much progress if they had not gained a critical supporter. In April 1973, Betsy Ancker-Johnson, a physicist and herself an inventor and patentholder, was appointed Assistant Secretary of Commerce for Science & Technology. *Ex officio*, she headed FCST's Committee on Government Patent Policy, and with the strong support of her special assistant at Commerce, David Eden, she quickly became a champion of inventor's rights. As a presidential appointee, not to mention chair of the Committee on Government Patent Policy, she had much more clout than Latker or Lasken. And to her mind, opposition to liberalizing government patent policy arose mostly out of ignorance; she quickly undertook the task of educating other committee members about how patenting, to her mind, really worked.¹⁶

With the efforts to further spread IPAs meeting resistance, this core group of four began to work on building support within FCST for new regulations that would allow IPAs at the other funding agencies. FCST executive secretary O. A. Neumann and representatives of the Department of Agriculture and the Environmental Protection Agency were helpful, but for much of the time Latker and Lasken were fighting alone within the University Patent Policy Ad Hoc Subcommittee.¹⁷ Ancker-Johnson's office, and particularly her assistant David Eden, took the

lead on other battles, including a 1974 fight over patent policy for the new Energy Research & Development Agency (ERDA, which supplanted the Atomic Energy Commission and would later become the Department of Energy).¹⁸

Supporters of government-wide changes in patent policy knew, however, that in the long run regulatory change would not be enough to achieve their goals: legislation would be needed. For one thing, much of government patent policy was governed by statute and regulation could not affect it. For another, Ralph Nader's Public Citizen, joined by eleven members of Congress, had sued the federal government in the early 1970s on the grounds that an institutional patent agreement was 'an unconstitutional disposition of property' (Latker, 1977: 2). Though Nader's suit was dismissed for lack of standing, Latker later said that he recognized that Nader had a point, and that the proponents of change 'knew that we were on relatively weak ground—we tried to make the best arguments we could...[But] we knew that there was a weakness, and the only way you could cure it was by legislation.'¹⁹

So at the same time that new regulations were being drafted, a comprehensive patent policy reform bill was also being written, largely by Latker, Lasken, and Eden. The draft bill was sweeping in scope, giving patent rights to all federal contractors and grantees, not just the universities, nonprofits, and small businesses which Bayh-Dole would cover (Federal Council for Science & Technology, 1976: 82-133). Only 16% of all federal R&D funding went to universities and other nonprofits in 1976 (National Science Foundation, 2002: Table 8); the FCST draft bill would have applied to a great many more federal dollars than the Bayh-Dole Act eventually did.

In 1977, the proponents of change gained the attention and support of Congressman Ray Thornton (D-AR), Chair of the House Subcommittee on Science, Research & Technology, who

twice introduced the FCST bill.²⁰ But it was just as this crucial point had been reached that the coalition of federal administrators experienced a succession of setbacks. First, the Thornton bills died in committee, largely because his committee had no jurisdiction over patents.²¹ Worse for their supporters, they drew the negative attention of Senator Gaylord Nelson (D-WI), who saw the proposed government-license patent policy as essentially a giveaway of public goods—he said that government would be ‘playing Santa Claus’ to private companies by giving them inventions rights—and decided to hold hearings of his own.²² In December 1977 he brought together some of the longest-standing opponents of a liberalized patent policy, such as the Navy’s Admiral Hyman Rickover and Senator Russell Long (D-LA) (U.S. Senate Select Committee on Small Business, 1978a).

At the same time, an even bigger problem was looming at NIH. With Norman Latker in charge of patenting at HEW, waivers of government patent rights had been granted on a fairly routine basis. But in 1977 the new administration brought with it a new Secretary for HEW, Joseph Califano. Califano disapproved of the idea of giving universities patent rights, and in August 1977 he ordered Latker to start sending all patent waiver requests to the general counsel’s office for approval (Broad, 1979b: 476). But the general counsel’s office did not actually approve any waivers. Instead, Califano announced that the patent policy was officially under review, and the waiver requests sat there, neither approved nor denied.²³ The months dragged on, and by September 1978 more than thirty inventions were stuck in this bureaucratic limbo (Leshowitz, 1979: 1). The situation was looking quite bleak for proponents of a government-license patent policy.

The University Patenting Community and the Final Push for Legislation

Until this time, the work of these federal administrators to change government patent policy had occurred on a track largely parallel to the emerging community of university patent administrators. While universities worked closely with Latker and Lasken on the creation of individual IPAs, and while patenting by universities was inching upward, for the most part universities were responding to, not creating, changes in government patent policy. But by 1977, the university patenting community had reached a critical mass. It was at this point that the federal administrators reconceived of their legislative project in a way that could take advantage of the as-yet-unrealized political power of university patent administrators. The resulting alliance cemented the ties among university patent administrators as well as providing support needed to get the Bayh-Dole Act passed in 1980.

Federal administrators had already played a role in advancing university patenting through the creation of IPAs, which decreased the barriers to patenting by removing bureaucratic hurdles. IPAs also made specific individuals at universities responsible for patent administration and thus helped create administrators who could participate in a professional community. And by virtue of their position, federal patent administrators served as nodes in the emerging social network of university patenters. But by October 1974 the developing community of university patent administrators had taken on a life of its own. Its members organized the first-ever conference on university technology transfer at Case Western Reserve University, a conference which drew 118 participants representing over fifty universities (National Conference on the Management of University Technology Resources, 1974: 197-204).²⁴ The participants in the three-day conference found they had lots to talk about, and after hours George Pickar of the University of Miami suggested to a group of attendees that they should form an ongoing organization to share information about university patenting (Bremer, 2001: 178). He became

the first president of SUPA, the Society of University Patent Administrators, which held its charter meeting in Chicago in February 1975, and drew seventy-five attendees representing forty universities (Sandelin, 2003).²⁵

But while SUPA had regular meetings in its first few years, and though its representatives testified at 1976 hearings on ERDA and the Thornton bill (U.S. House of Representatives Committee on Banking, Finance, & Urban Affairs; U.S. House of Representatives Committee on Science, Space, & Technology, 1976) it was not yet very involved in political activity (Bremer, 2001: 179). A strategic decision by the federal proponents of policy change, however, proved critical in bringing SUPA more fully into the political arena. By early 1978, after multiple steps backward—the failed Thornton bills, the Nelson hearings, the waiver holdups at HEW—it was becoming increasingly clear that the federal administrators seeking a new government patent policy were not having much success with their current strategy.²⁶

So they changed tactics. Much of the Congressional opposition to a government-license patent policy grew out of concern that allowing industry contractors to maintain title to government-sponsored research was effectively giving away a public good. So the proponents of a government-license policy decided to focus their energies on pursuing legislation substantially limited in scope. Instead of trying to change federal patent policy as it applied to all contractors and grantees, including big corporations, they began to seek support for a bill that would only apply to universities and other nonprofits, and small businesses. This would allow them to draw on the lobbying power of the increasingly well-organized university patenting community as well as small business, and at the same time defuse much of the government-giveaway criticism, since these groups were seen as more likely to use patent rights in the public interest.²⁷

Jesse Lasken of NSF recalled a critical dinner at which he and Norman Latker met with Sheldon Steinbach, an attorney for the Council on Governmental Relations (COGR, a research university association with ties to SUPA) and Eric Schellin, of the National Small Business Association, to solidify this plan.²⁸ With their connections to both federal and university patent administrators, Lasken and Latker were in an excellent position to bring the resources of the two groups together. Lasken in particular had useful connections with the small business community from an NSF program that gave research grants to small businesses.²⁹

SUPA, now led by Howard Bremer of WARF, took on an important role in coordinating university support for legislation.³⁰ Though the political action of its members was limited up to this point, university patent administrators were attuned to what was going on, particularly since their inventions were now being held up at HEW. They began contacting their representatives with their concerns and complaints. In fact it was Ralph Davis, a patent administrator from Purdue who had negotiated one of the original IPAs and helped found SUPA, who met with Senator Birch Bayh (D-IN)—along with Howard Bremer and Norman Latker—and convinced him and his aide Joe Allen that this was a cause worth supporting (Stevens, 2004: 94; Bayh, 2005: 7); Bayh, of course, became one of the bill's sponsors. Senator Bob Dole's (R-KS) office got involved through another route, when staffer Barry Leshowitz, a professor of psychology at the University of Arizona, heard that the waiver process at HEW had essentially shut down. Leshowitz was in Washington for a year as an AAAS Congressional Fellow, and he was a strong proponent of inventor's rights in part because he was an inventor himself and had heard stories from colleagues who had had difficulties negotiating government patent policy. He brought the issue to the attention of Senator Dole, who agreed that it was important and became a champion of the cause.³¹

Together, Senators Dole and Bayh, with the help of the growing array of federal, university, and small business supporters, decided to introduce legislation (95 S. 3496) that would establish a broad government-license patent policy, but hew to the new strategy of limiting the bill's scope. The Dole-Bayh Act, as it was initially called, would give universities, other nonprofits, and small businesses title to all government-funded inventions by default, with the caveat that the government retained 'march-in rights' should inventions not be used in the public interest. The bill would not affect existing patent policy with regards to big business. The announcement was made at a press conference on 13 September 1978, at which Dole publicly excoriated HEW for 'stonewalling' title waivers on inventions (Broad, 1978; Eskridge, 1978: 605)—which HEW Secretary Califano then ordered released to universities the next day (Leshowitz, 1979: 15).³² The bill did not elicit the same degree of immediate opposition that past efforts had, a fact generally attributed to the exclusion of big business from the bill and the 'heightened national concern over the waning of innovation' (Graham, 1979: M1).

But despite their substantial base of support, Dole and Bayh were not able to get the bill out of the Senate Judiciary Committee in the last months of the 95th Congress. As planned, they reintroduced the bill the following session as the Bayh-Dole Act, S. 414, in February 1979. At this point the bills' proponents—federal administrators, representatives of universities, and members of the small business community—kicked into full gear in an effort to build support for it.

The university patenting community in particular now became politically active to a greater extent than ever before. Its members fought for the bill both by targeting their individual representatives—particularly members of the Judiciary Committee, which had jurisdiction over patent issues—as well as organizing collectively and partnering with other professional

associations so that they could speak on behalf of not just individual university patent administrators, but higher education as a whole. MIT, for example, focused on Senator Ted Kennedy (D-MA), then chair of the Judiciary Committee, who initially opposed the bill but eventually became a cosponsor.³³ The most dramatic turnaround was probably that of Senator Nelson. After he convened the December 1977 hearings dominated by opponents of the patenting of government-funded inventions, ‘the IPA-holders all got together...The universities themselves bombarded Nelson to the point where he had to set up another hearing [in May 1978] to invite all the people that were in favor of it.’³⁴ And not only did they gain a hearing, but they eventually won Nelson over. He went from being a potential threat (Graham, 1979: M1), to ‘not “actively oppos[ing]” the bill’ (Broad, 1979a: 474) to finally signing on as another cosponsor, a reversal which Betsy Ancker-Johnson later referred to as ‘Senator Nelson’s Damascus-Road conversion’ (Ancker-Johnson, 1980).

SUPA worked on getting the major higher education associations to sign on in support. The Council on Governmental Relations (COGR, representing university business officers), which worked on regulatory issues, had long been aware of the issue and became an ally; it had had a patent committee (chaired by Howard Bremer) since the early 1970s.³⁵ The American Council on Education, representing all of higher education, lent its support as well. So when SUPA members testified to Congress, they were able to do so on behalf of groups much larger than themselves (see, for example, U.S. Senate Committee on Commerce, Science, & Transportation, 1980). And representatives of universities were heard on many occasions in Congress. Bremer traveled to Washington multiple times to speak to Congress on behalf of policy change; multiple others from the university community also testified (U.S. Senate Committee on Commerce, Science, & Transportation, 1980; U.S. Senate Committee on Science,

Space, & Technology, 1977; U.S. Senate Committee on the Judiciary, 1979; U.S. Senate Select Committee on Small Business, 1978b).

There are always multiple answers to the question of what actually causes something like a piece of legislation to pass and become law. In a most proximate sense, the commitment of Senators Bayh and Dole was critical, as was that of two of their key staffers who worked on the bill, Joe Allen in Senator Bayh's office, and Barry Leshowitz in Senator Dole's office. The changing economic mood of the country played a role, too. In the late 1970s, policymakers were increasingly worried that the U.S.'s poor economic performance was being caused by lagging technological development, and they were looking for solutions to that problem. Though the federal administrators who had begun the campaign for a government-license patent policy had not done so specifically because they thought it would have economic consequences—they were more concerned about improving the utilization of technology and protecting inventors' rights—they certainly used that argument when doing so was politically expedient.³⁶ Reducing the scope of the bill also defused a lot of the criticism that Thornton had received; Jesse Lasken of NSF said, 'I think what happened that turned the tide was that we avoided dealing with big business.'³⁷

Califano's decision to stop approving university petitions for waiver served as a catalyst for change.³⁸ Interesting people in patent policy, and in the nuances of an argument about the best incentives for getting new technology into use, was not always an easy project. But when Califano stopped approving waivers, he gave supporters of Bayh-Dole something they could point to very concretely: a list of more than thirty inventions that could be on the market and saving lives, but instead were sitting on a desk at HEW going nowhere (Leshowitz, 1979: xx). As Dole's staffer Leshowitz said, 'That was kind of like dynamite. Why shouldn't these

inventions be given a chance, a chance to go from the laboratory to the marketplace?’ This was ‘clearly newsworthy’.³⁹

Califano’s move also motivated universities. There was nothing like having specific inventions blocked, particularly now that universities were used to routine waivers from HEW, to stimulate greater political activity. And while people I spoke to attributed the ultimate passage of Bayh-Dole to multiple causes, they were consistent in agreeing that the collective support of universities was important. As Howard Bremer of WARF said, ‘The way I like to look at it is finally universities were speaking with a loud single voice in this arena. I think that is ultimately what carried the day’ (Bremer, 2001: 181). The universities’ lobbying effort did not only help to pass the legislation, however. It also helped consolidate the community. Until 1978, SUPA was ‘kind of muddling along...I think what gave SUPA its real push at that time was the fact that we became a cohesive unit to testify on behalf of the university community for passage of Bayh-Dole’ (Bremer, 2001: 179). In this way the process of passing Bayh-Dole, as well as the legislation itself, further established the university patenting community.

The details of the political machinations of 1979 and 1980 that ultimately led to the passage of Bayh-Dole are beyond the scope of this paper, and their story has been told elsewhere.⁴⁰ But gradually, support for the bill coalesced in the Senate. By the time Nelson signed on as a cosponsor in October 1979, it had thirty-two cosponsors. When the bill reached the Senate floor in April 1980, there were fifty-four cosponsors, and the measure passed 91-4. Ultimately, the Bayh-Dole Act was passed in its final form in November 1980 and signed into law by President Jimmy Carter in the last days of the 96th Congress, on 12 December 1980, when it became Public Law 96-517 and a new era began for technology transfer in universities.

Conclusions

This paper began with the point that limited progress has been made toward understanding the increase in university patenting that began almost forty years ago: both the initial rise that preceded the Bayh-Dole Act, and the motivations for the Act itself, which accelerated that trend. It then makes the case that both of these trends can be seen as part of a larger political project undertaken by a group of federal administrators to transform government patent policy. Acting out of a belief that ownership rights to inventions need to stay as close to the inventors as possible in order to encourage their development, they hoped to promote a patent policy that would allow government contractors and grantees—for-profit and nonprofit, large and small—to maintain control over their inventions. They pursued that goal on multiple levels: by creating administrative mechanisms like institutional patent agreements, by seeking regulatory changes that would put invention rights in the hands of inventors more frequently, and by pursuing legislation to change government patent policy. Ultimately, they succeeded in doing so—not just with the Bayh-Dole Act, but with its extension to large businesses through a 1983 Presidential Memorandum (‘Government Patent Policy’, 1983).

In the interim, they—with the help of university patent administrators—transformed university patent practices as well. Universities receive a small fraction of all federal R&D money. But the biggest early supporters of change were patent attorneys at NIH and NSF, which primarily fund academic science. So the efforts to liberalize government patent policy began with universities. Into the 1960s, universities did little patenting and there was no professional community of people who managed patenting for universities. The creation of IPAs at NIH in 1968 and NSF in 1973, as well as the encouragement of patenting by administrators there, helped to change that: by directly increasing the number of patents universities sought on NIH- and

NSF-funded research, by requiring universities to put someone in charge of patenting as a prerequisite of being issued an IPA and thus creating more people who could potentially participate in a university patenting community, and by helping maintain social connections among scattered university patent administrators. These early steps laid the foundations for the establishment of an independent professional organization, SUPA, in 1974.

In the meanwhile, the federal administrators who sought policy change were building alliances and working within interagency groups to try to change regulations and support legislation that would create a new patent policy for *all* government contractors and grantees. But after several setbacks in 1977 and 1978, they regrouped, deciding that their most realistic strategy was to defuse some criticisms of their proposed policies and leverage the political power of the newly-organized university patent administrators by proposing a more limited bill that would only affect universities, other nonprofits, and small businesses.

Universities actively campaigned for this new bill, gaining the support of many representatives through individual meetings and others through Congressional testimony at which patent administrators spoke not only on behalf of SUPA, but larger organizations like the Council on Governmental Relations and the American Council on Education. It was not an easy fight, but it was a successful one, and with the help of small business and the federal administrators who had been the originators of the legislation, the Bayh-Dole Act became law in December 1980. The effort helped consolidate the university patenting community as well, which was critical in spreading knowledge about and encouragement of patenting and technology transfer activities to more universities.

This narrative of the transformation of university patent practices through the joint efforts of state and university actors places the spotlight on some causes of increasing university

patenting and away from others. State action and the development of a professional community were not the only causes of these increases; for example, this paper neglects the important role of Research Corporation in helping to train universities to manage their own patents (Mowery & Sampat, 2001a). Other proposed causes, like the effects of Niels Reimers' creation of a marketing model of technology transfer at Stanford, I do not address because their impact occurred mostly subsequent to Bayh-Dole. Instead, this paper suggests we give a greater consideration to 1) the role of state actors, particularly federal administrators, in changing university patenting during the 1960s and 1970s, 2) the role of a new professional community of university patent administrators in spreading and encouraging patenting by universities, and 3) the interaction and positive feedback between the two in creating the post-Bayh-Dole technology transfer regime.

Notes

¹ This is particularly common in even well-informed pieces in the popular press; see, for example, Leaf & Burke, 2005, and 'Innovation's Golden Goose', 2002.

² These figures are approximate; exact numbers vary depending on how one counts.

³ In 1953, when NSF began collecting data, the federal government already provided 54% of university R&D expenditures; that percentage steadily increased to a peak of 73.5% in 1966 (National Science Foundation, 2005: Table 1).

⁴ See Eisenberg, 1996 for a comprehensive history of federal patent policy beginning in 1941, and Kleinman, 1995 for a detailed discussion of the post-World War II debate over federal science policy, including patent policy.

⁵ Research Corporation was a nonprofit organization that undertook patent management for universities. Founded in 1912 to insulate universities from culturally suspect involvement in patenting, in the 1950s and 60s it had invention management agreements with some 200 universities. Mowery & Sampat (2001a) show that Research Corporation

played an important role in increasing universities' own patent management capabilities in the 1960s and 70s through its training program, a role I see as significant in the creation of a university patenting community but do not address in this paper because of limitations of space.

⁶ Interview with Howard Bremer, 21 December 2004.

⁷ Battelle Development Corporation was a nonprofit organization that assisted universities with patent management, but on a much smaller scale than Research Corporation.

⁸ Bremer said that the Licensing Executives Society, which was established in 1965, was originally started 'as a university-oriented organization', but that it became oriented toward 'private practice and industry' (Bremer, 2001: 50).

⁹ The Department of Defense was already using a mechanism similar to IPAs in the 1960s: it maintained a list of institutions, published in Defense Procurement Circular No. 65, to which it would routinely waive title upon request (National Conference on the Management of University Technology Resources, 1974: 39). Though the Defense Department list was established in 1964, and though the department was a significant funder of university research, my interviewees did not suggest that its creation had much impact on university patenting, perhaps because the Defense Department had been very liberal with title waivers even before it issued the list.

¹⁰ These paragraphs draw on interviews with Norman J. Latker held 21, 24, and 28 January 2005, and 6 April 2005.

¹¹ The Harbridge House report was commissioned by the Federal Council for Science and Technology's Committee on Government Patent Policy, an interagency organization established by the President. The GAO report was requested by Congress.

¹² The first IPAs were signed on 1 December 1968 by Caltech, Cornell, Florida State, Illinois, Iowa State, Kansas, MIT, Michigan State, Minnesota, Mount Sinai Hospital, Ohio State, Princeton, Purdue, Utah, the University of Washington, Washington State, and Wisconsin. (List from the personal papers of Norman Latker.) As early as 1966, thirty-three requests for IPAs were pending; by 1978, seventy-two IPAs had been executed (Latker, 1978: 10, 14).

¹³ Interview with Norman J. Latker, 21 January 2005.

¹⁴ Interview with Norman J. Latker, 6 April 2005.

¹⁵ In January 1977 the Department of Defense employed 193 patent attorneys, the Energy Research and Development Agency (later the Department of Energy) employed 60, and NASA employed 32 (figures from the personal files of Norman J. Latker).

¹⁶ Interview with Betsy Ancker-Johnson, 22 April 2005.

¹⁷ Interview with Norman J. Latker, 21 January 2005. Latker said that Lasken was his only real ally (besides Ancker-Johnson) on the FCST committees, and suggested that the other committee members only eventually agreed to the proposed regulations ‘to get me and Jesse to shut up’. (From interview with Norman J. Latker, 6 April 2005.) Lasken said laughingly, ‘Basically, it was usually me and Norm against the rest.’ (From interview with Jesse E. Lasken, 7 March 2005.) Ancker-Johnson provided the political protection so that they could fight this battle. In a victory speech following Bayh-Dole, she said that ‘the inner circle consisted of about six members of the Executive Subcommittee [including Latker; Lasken was an alternate] of the Committee on Government Patent Policy’ (Ancker-Johnson, 1980).

¹⁸ In Ancker-Johnson’s words,

President Ford was anxious to get started with his energy initiative of which ERDA was to be the cornerstone. His eagerness, however, left him vulnerable to a handful in Congress who saw an opportunity to impose rigid patent policies upon the fledgling organization. We fought this opposition to a standstill, then turned the tide so that, in the end, ERDA’s patent policy was a lot better than that found in many federal programs...The battle ended with a minor victory for our side: we had averted disaster and had actually gained a little ground. (Ancker-Johnson, 1980)

¹⁹ Interview with Norman J. Latker, 6 April 2005.

²⁰ It was introduced as H.R. 6249 in April, and H.R. 8596 in July.

²¹ Interview with Norman J. Latker, 6 April 2005.

²² Nelson said of taxpayers, ‘First, they are paying through the nose for this risk-free, tax-supported research and development. Then they pay dearly all over again, for the grossly inflated prices these companies charge for the products they market under patent rights given to them by the government’ (Lovell, 1978: 1666).

²³ Interview with Norman J. Latker, 6 April 2005.

²⁴ In fact, according to at least one participant Ancker-Johnson provided the impetus for the whole conference:

At the 1973 annual meeting of the National Council of University Research Administrators, part of one afternoon was devoted to patents....The truly significant part of this meeting was the principal luncheon speaker, Betsy A. Johnson, Ph.D. At that time, Johnson held the post of deputy secretary of commerce, and part of her duties included the oversight of the U.S. Patent and Trademark Office. The theme of her speech was astounding. She said that the government's treatment of the universities' inventions was disgraceful, and why did we not get together and do something about it. That was invitation enough. (Snyder, 2004: 20)

Latker also credited Ancker-Johnson as being 'the one who encouraged them to organize'. (Interview with Norman J. Latker, 6 April 2005.) Ancker-Johnson was the keynote speaker at the Case Western conference; Latker spoke as well (National Conference on the Management of University Technology Resources, 1974).

²⁵ Bremer (2004: 12-13) lists others who were critical supporters of SUPA in its early years. See Association of University Technology Managers, 2004, for more on the history of SUPA.

²⁶ One limited success was that the regulations the University Patent Policy Ad Hoc Subcommittee had long been working on, which made it possible for more agencies to choose to create IPAs, were published in March 1978 (Broad, 1978a).

²⁷ Furthermore, much of the historical opposition to a government-license policy had come from the Senate Select Committee on Small Business. The concern was that patents were a form of monopoly with which big businesses could prevent small businesses from competing, and thus that allowing big businesses to patent inventions resulting from government contracts would hurt small businesses. So limiting the scope of the bill in this way turned supporters of small business from potential opponents to active supporters. Not surprisingly, big business wanted to be included in the bill, but they agreed to remain neutral to it (though they were supporting an alternate bill), perhaps because Latker and many of his associates hoped to eventually extend the bill to include them. (Interview with Norman J. Latker, 6 April 2005.)

²⁸ Interview with Jesse E. Lasken, 7 March 2005.

²⁹ Lasken thought, however, that it was universities and not the small business community that provided the most support for the bill, commenting that the small business community was never as good as lobbying as one might think because they were too busy running their businesses. (From interview with Jesse E. Lasken, 7 March 2005.)

³⁰ Interview with Sheldon Steinbach, 31 March 2005.

³¹ Interview with Barry Leshowitz, 28 February 2005. While Leshowitz was a university professor and an inventor, he had no previous ties to the SUPA community.

³² Latker, however, was summarily dismissed from HEW in December for his efforts, though he was later reinstated with the support of Dole and Bayh and publicity calling his firing retaliation against a whistleblower (Graham, 1979: M1).

³³ Interview with Jesse E. Lasken, 7 March 2005.

³⁴ Interview with Norman J. Latker, 21 January 2005. For the second Nelson hearings, see U.S. Senate Select Committee on Small Business, 1978b.

³⁵ Interview with Sheldon Steinbach, 31 March 2005.

³⁶ When asked how much the economic situation and the issue of economic competitiveness mattered in passing the bill, Latker said, ‘That was an issue that came up after the fact that we could use to support the bill.’ (Interview with Norman J. Latker, 6 April 2005.)

³⁷ Interview with Jesse E. Lasken, 7 March 2005.

³⁸ Califano’s ‘excesses helped our cause tremendously, turning otherwise neutral parties to our side’ (Ancker-Johnson, 1980).

³⁹ Interview with Barry Leshowitz, 28 February 2005.

⁴⁰ See Stevens, 2004 for a detailed account of the legislative wranglings of 1978-1980 and Eisenberg, 1996: 1689-95 for the legislative history of both Bayh-Dole and competing proposals.

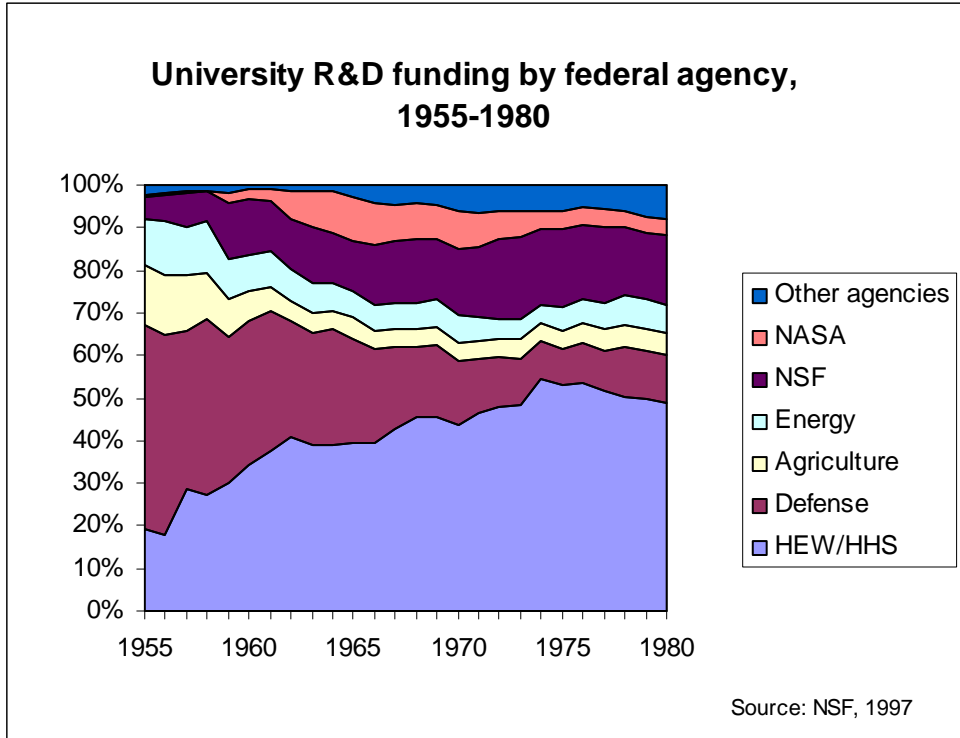


Table 1.

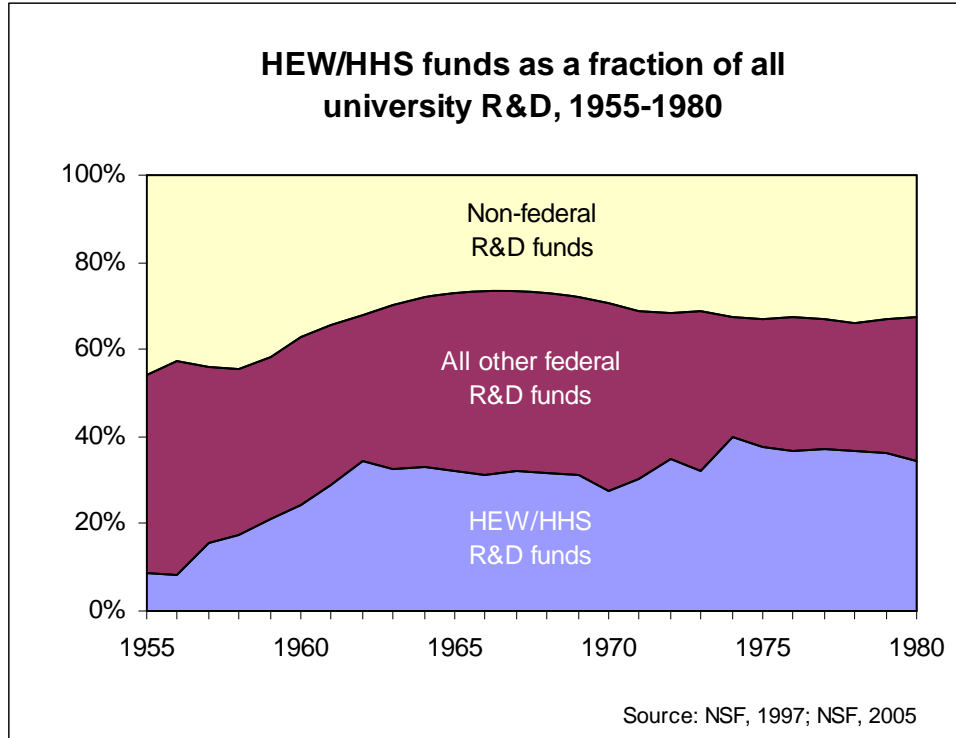


Table 2.

References

- Ancker-Johnson, Betsy (1980) Unpublished speech celebrating the signing of the Bayh-Dole Act, from the personal papers of Norman J. Latker.
- Association of University Technology Managers (2004) *AUTM Founders Booklet* (Northbrook, IL: AUTM).
- Association of University Technology Managers (2004) *AUTM Licensing Survey: FY 2003 Survey Summary* (Northbrook, IL: AUTM).
- Bayh, Birch (2004) 'Plenary Session: Celebrating 30 Years of AUTM and the Bayh-Dole Act', in Association of University Technology Managers, *Recollections: Celebrating the History of AUTM and the Legacy of Bayh-Dole* (Northbrook, IL: AUTM): 6-10.
- Bok, Derek (2003) *Universities in the Marketplace: The Commercialization of Higher Education* (Princeton, NJ: Princeton University Press).
- Bozeman, Barry (2000) 'Technology Transfer and Public Policy: A Review of Research and Theory', *Research Policy* 29: 627-55.
- Bremer, Howard W. (2001) Oral History No. 565 (Madison, WI: University of Wisconsin Oral History Program).
- Bremer, Howard (2004) 'Musings', in Association of University Technology Managers, *Recollections: Celebrating the History of AUTM and the Legacy of Bayh-Dole* (Northbrook, IL: AUTM): 11-13.
- Broad, William J. (1978) 'Briefing: Senate Bill Gives Bright Idea Back to Inventor', *Science* 201 (29 September): 1194-5.
- Broad, William J. (1979a) 'Patent Bill Returns Bright Idea to Inventor', *Science* 205 (3 August): 473-6.

- Broad, William J. (1979b) 'Whistle Blower Reinstated at HEW', *Science* 205 (3 August): 476.
- Commission on Government Procurement (1972a) *Report of the Commission on Government Procurement* (4 vols.) (Washington, DC: U.S. Government Printing Office).
- Commission on Government Procurement (1972b) *Summary of the Report of the Commission on Government Procurement* (Washington, DC: U.S. Government Printing Office).
- Eisenberg, Rebecca S. (1996) 'Public Research and Private Development: Patents and Technology Transfer in Government-Sponsored Research', *Virginia Law Review* 82: 1663-727.
- Endicott, Kenneth M. (1962) Memo to the Surgeon General and the Director of NIH from Kenneth M. Endicott, Director, National Cancer Institute, from the personal papers of Norman J. Latker (18 April). (Photocopy available from the author.)
- Eskridge, N. (1978) 'Dole Blasts HEW for "Stonewalling" Patent Applications', *BioScience* 28: 605-6.
- Etzkowitz, Henry (2002) *MIT and the Rise of Entrepreneurial Science* (London: Routledge).
- Etzkowitz, Henry & Loet Leydesdorff (eds) (1997) *Universities and the Global Knowledge Economy: A Triple Helix of University-Industry-Government Relations* (London: Pinter).
- Etzkowitz, Henry & Loet Leydesdorff (2000) 'The Dynamics of Innovation: From National Systems and "Mode 2" to a Triple Helix of University-Industry-Government Relations', *Research Policy* 29: 109-23.
- Federal Council for Science & Technology (1965) *Annual Report on Government Patent Policy* (Washington, DC: U.S. Government Printing Office).
- Federal Council for Science & Technology (1967) *Annual Report on Government Patent Policy* (Washington, DC: U.S. Government Printing Office).

Federal Council for Science & Technology (1972) *Annual Report on Government Patent Policy* (Washington, DC: U.S. Government Printing Office).

Federal Council for Science & Technology (1976) *Report on Government Patent Policy, 1973-1976* (Washington, DC: U.S. Government Printing Office).

Feldman, Maryann, & Pierre Desrochers (2004) 'Truth for Its Own Sake: Academic Culture and Technology Transfer at the Johns Hopkins University', *Minerva* 42: 105-26.

Geiger, Roger L. (2004) *Knowledge and Money: Research Universities and the Paradox of the Marketplace* (Stanford, CA: Stanford University Press).

Graham, Bradley (1979) 'Patent Bill Seeks Shift to Bolster Innovation', *Washington Post* (8 April): M1.

'Government Patent Policy. Memorandum from the President. February 18, 1983' (1983) *Weekly Compilation of Presidential Documents* 19 (21 February): 252-3.

Harbridge House Inc. (1968) *Government Patent Policy Study: Final Report* (Washington, DC: U.S. Government Printing Office).

Henderson, Rebecca, Adam B. Jaffe, & Manuel Trajtenberg (1998) 'Universities as a Source of Commercial Technology: A Detailed Analysis of University Patenting, 1965-1988', *The Review of Economics and Statistics* 80: 119-27.

Hiller, Manuel B. (1964) Memo to David E. Price, Deputy Surgeon General, from Manuel B. Hiller, Department Patents Officer, from the personal papers of Norman J. Latker (21 August). (Photocopy available from the author.)

Hughes, Sally Smith (2001) 'Making Dollars out of DNA: The First Major Patent in Biotechnology and the Commercialization of Molecular Biology, 1974-1980', *Isis* 92: 541-75.

- ‘Innovation’s Golden Goose’ (2002) *The Economist* (12 December).
- Jensen, Richard, & Marie C. Thursby (2001) ‘Proofs and Prototypes for Sale: The Licensing of University Inventions’ *The American Economic Review* 91: 240-59.
- Kirp, David L. (2003) *Shakespeare, Einstein, and the Bottom Line: The Marketing of Higher Education* (Cambridge, MA: Harvard University Press).
- Kleinman, Daniel Lee (1995) *Politics on the Endless Frontier: Postwar Research Policy in the United States* (Durham, NC: Duke University Press).
- Kleinman, Daniel Lee (2003) *Impure Cultures: University Biology and the World of Commerce* (Madison, WI: University of Wisconsin Press).
- Kraemer, Sylvia Katharine (1999) ‘NASA, Monopolies, and the Cold War: The Origins and Consequences of NASA Patent Policy, 1958-1996’, Paper presented to the Annual Meeting of the Society for the History of Technology. Available at <http://www.hq.nasa.gov/office/codez/plans/R&D/SHOTOCT99.html> (accessed 3 January 2006).
- Latker, Norman J. (1971) ‘Presentation of Norman J. Latker before the Commission on Government Procurement, July 29, 1971’, from the personal papers of Norman J. Latker. (Photocopy available from the author.)
- Latker, Norman J. (1978) ‘The Patent Policy of the Department of Health, Education, and Welfare’, unpublished report from the personal papers of Norman J. Latker. (Photocopy available from the author.)
- Leaf, Clifton & Doris Burke (2005) ‘The Law of Unintended Consequences’, *Fortune* (19 September).

Leshowitz, Barry (1979) ‘The Demise of Technology Transfer in DHEW’, unpublished paper from the personal files of Norman J. Latker. (Photocopy available from the author.)

Lovell, D. J. (1978) ‘Patents Patter’, *Applied Optics* 17 (1 June): 1666-7.

MacCordy, Edward L. (1962) Letter to John F. Due, Chair, Senate Committee on Honorary Degrees, University of Illinois, from Edward L. MacCordy, Associate Vice Chancellor for Research, Washington University, from the personal papers of Norman J. Latker (9 November). (Photocopy available from the author.)

‘Memorandum & Statement of Government Patent Policy’ (1963) *Federal Register* 28: 10,943-10,946.

Merrifield, D. Bruce. (1984) Letter to John F. Due, Chair, Senate Committee on Honorary Degrees, University of Illinois, from D. Bruce Merrifield, Assistant Secretary for Productivity, Technology, and Innovation, U.S. Department of Commerce, from the personal papers of Norman J. Latker (13 November). (Photocopy available from the author.)

Mowery, David C., Richard R. Nelson, Bhaven N. Sampat & Arvids A. Ziedonis (2001) ‘The Growth of Patenting and Licensing by U.S. Universities: An Assessment of the Effects of the Bayh-Dole Act of 1980’, *Research Policy* 30: 99-119.

Mowery, David C., Richard R. Nelson, Bhaven N. Sampat & Arvids A. Ziedonis (2004) *Ivory Tower and Industrial Innovation: University-Industry Technology Transfer before and after the Bayh-Dole Act* (Stanford, CA: Stanford University Press).

Mowery, David C. & Bhaven N. Sampat (2001a) ‘Patenting and Licensing University Inventions: Lessons from the History of the Research Corporation’, *Industrial and Corporate Change* 10: 317-55.

Mowery, David C. & Bhaven N. Sampat (2001b) ‘University Patents and Patent Policy Debates in the USA, 1925-1980’, *Industrial and Corporate Change* 10: 781-814.

Mowery, David C. & Arvids A. Ziedonis (2000) ‘Numbers, Quality, and Entry: How Has the Bayh-Dole Act Affected U.S. University Patenting and Licensing?’, *NBER Innovation Policy and the Economy* 1: 187-220.

Mowery, David C. & Arvids A. Ziedonis (2002) ‘Academic Patent Quality and Quantity before and after the Bayh-Dole Act in the United States’, *Research Policy* 31: 399-418.

National Conference on the Management of University Technology Resources (1974) *Technology Transfer: University Opportunities and Responsibilities* (Cleveland, OH: Case Western Reserve University).

National Institutes of Health Office of Budget (2005a) ‘History of Congressional Appropriations, 1950-1959’, available at <http://officeofbudget.od.nih.gov/PDF/appic1950-1959.pdf> (accessed 25 December).

National Institutes of Health Office of Budget (2005b) ‘History of Congressional Appropriations, 1960-1969’, available at <http://officeofbudget.od.nih.gov/PDF/appic1960-1969.pdf> (accessed 25 December).

National Science Foundation Division of Science Resources Statistics (1997) *Survey of Federal Funds for Research and Development: Fiscal Years 1995, 1996, and 1997*, NSF 97-327 (Arlington, VA: National Science Foundation).

National Science Foundation Division of Science Resources Statistics (2002) *Survey of Federal Funds for Research and Development: Fiscal Years 2000, 2001, and 2002*, NSF 02-321 (Arlington, VA: National Science Foundation).

- National Science Foundation Division of Science Resources Statistics (2005) *Academic Research and Development Expenditures: Fiscal Year 2003*, NSF 05-320 (Arlington, VA: National Science Foundation).
- Newman, Frank (2004) *The Future of Higher Education: Rhetoric, Reality, and the Risks of the Market* (San Francisco: Jossey-Bass).
- Owen-Smith, Jason & Walter W. Powell (2001) 'To Patent or Not: Faculty Decisions and University Success at Technology Transfer', *Journal of Technology Transfer* 26: 99-114.
- Owen-Smith, Jason & Walter W. Powell (2003) 'The Expanding Role of University Patenting in the Life Sciences: Assessing the Importance of Experience and Connectivity', *Research Policy* 32: 1695-711.
- Palmer, Archie M. (1948) *Survey of University Patent Policies: Preliminary Report* (Washington, DC: National Research Council).
- Patent and Trademark Law Amendments Act* (Bayh-Dole Act) (1980) U.S. Public Law 517, 96th Congress, 2nd Session (12 December).
- Sandelin, Jon (2003) '30 Years of AUTM: Planning Begins' *AUTM Newsletter* (September/October).
- Shannon, James A. (1964) Memo to the Surgeon General from James A. Shannon, Director, NIH, from the personal papers of Norman J. Latker (14 August). (Photocopy available from the author.)
- Slaughter, Sheila (1990) *The Higher Learning and High Technology: Dynamics of Higher Education Policy Formation* (Albany, NY: State University of New York Press).
- Slaughter, Sheila & Larry L. Leslie (1997) *Academic Capitalism: Politics, Policies, and the Entrepreneurial University* (Baltimore, MD: The Johns Hopkins University Press).

- Slaughter, Sheila & Gary Rhoades (2004) *Academic Capitalism and the New Economy: Markets, State, and Higher Education* (Baltimore, MD: The Johns Hopkins University Press).
- Smith, R. Jeffrey (1978) 'Patent Policy Changes Stir Concern', *Science* 199 (17 March): 1190.
- Snyder, Ray E. (2004) 'AUTM/SUPA: A Brief History', in Association of University Technology Managers, *Recollections: Celebrating the History of AUTM and the Legacy of Bayh-Dole* (Northbrook, IL: AUTM): 20-2.
- Stevens, Ashley J. (2004) 'The Enactment of Bayh-Dole', *Journal of Technology Transfer* 29: 93-9.
- Thursby, Jerry G. & Marie C. Thursby (2002) 'Who Is Selling the Ivory Tower? Sources of Growth in University Licensing', *Management Science* 48: 90-104.
- U.S. Department of Justice (1947) *Investigation of Government Patent Practices and Policies: Report and Recommendations of the Attorney General to the President* (3 vols) (Washington, DC: U.S. Government Printing Office).
- U.S. General Accounting Office (1968) *Problem Areas Affecting Usefulness of Results of Government-Sponsored Research in Medicinal Chemistry: A Report to the Congress* (Washington, DC: U.S. Government Printing Office).
- U.S. House of Representatives Committee on Banking, Finance, & Urban Affairs (1976) *To Provide Additional Assistance to the Energy Research & Development Administration for the Advancement of Nonnuclear Energy Research, Development, and Demonstration* (Washington, DC: U.S. Government Printing Office).
- U.S. House of Representatives Committee on Science, Space, & Technology (1976) *Government Patent Policy: The Ownership of Inventions Resulting from Federally Funded R&D* (Washington, DC: U.S. Government Printing Office).

U.S. Senate Committee on Commerce, Science, & Transportation (1980) *Patent Policy, Part 1*
(Washington, DC: U.S. Government Printing Office).

U.S. Senate Committee on the Judiciary (1960) *Government Patent Practices* (Washington, DC:
U.S. Government Printing Office).

U.S. Senate Committee on the Judiciary (1961) *Government Patent Policy* (Washington, DC:
U.S. Government Printing Office).

U.S. Senate Committee on the Judiciary (1965) *Government Patent Policy* (Washington, DC:
U.S. Government Printing Office).

U.S. Senate Committee on the Judiciary (1979) *University and Small Business Patent
Procedures Act* (Washington, DC: U.S. Government Printing Office).

U.S. Senate Select Committee on Small Business (1959) *Patent Policies of Departments and
Agencies of the Federal Government* (Washington, DC: U.S. Government Printing
Office).

U.S. Senate Select Committee on Small Business (1960) *Patent Policies of Government
Departments and Agencies: Conference on Federal Patent Policies* (Washington, DC:
U.S. Government Printing Office).

U.S. Senate Select Committee on Small Business (1963) *Economic Aspects of Government
Patent Policies: Impact of Government Patent Policies on Economic Growth, Scientific
and Technological Progress, Competition, Monopoly, and Opportunities for Small
Business* (Washington, DC: U.S. Government Printing Office).

U.S. Senate Select Committee on Small Business (1978a) *Government Patent Policies*
(Washington, DC: U.S. Government Printing Office).

U.S. Senate Select Committee on Small Business (1978b) *Government Patent Policies:*

Institutional Patent Agreements (Washington, DC: U.S. Government Printing Office).

Washburn, Jennifer (2005) *University, Inc.: The Corporate Corruption of American Higher*

Education (New York: Basic Books).

Whittaker, James L. (1971) Letter to Roman C. Braun, Chairman, Study Group No. 6,

Commission on Government Procurement, from James L. Whittaker, Chairman, Patent

Operations, RCA Corporation, from the personal papers of Norman J. Latker (11

November). (Photocopy available from the author.)