

Academic Discourse and Proprietary Rights: Putting Patents in Their Proper Place

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**ABSTRACT**

*25 years after the passage of the Bayh-Dole Act, patents and technology transfer are firmly entrenched in academia, but instead of being a simple aid to the dispersion and implementation of university discoveries, patent rules too often are dictating the pace, form, and scope of discourse and sometimes even the direction of the research itself. The public is likely to lose if researchers have to choose between engaging in academic discourse and obtaining proprietary rights.*

*This Article provides a fresh perspective on the Bayh-Dole debate by focusing on the often overlooked impact of patent novelty rules on academic discourse. The Article proposes that to begin to reverse the observed deterioration in disclosure norms, flexibilities must be built into the patent system so that patents can be facilitators, not controllers, of the academic knowledge dissemination enterprise. In particular, the Article advocates creation of an opt-in extended grace period which would provide more time for academic researchers to publish and present early stage research before having to file a patent application. Such an extension, coupled with early application publication, would allow researchers to engage in traditional academic discourse while retaining the ability to obtain proprietary rights necessary for commercialization of their inventions. Importantly, it would also provide for early disclosure of discoveries for other scientists to build upon in keeping with the beneficial norms of the academic enterprise.*

## ACADEMIC DISCOURSE AND PROPRIETARY RIGHTS: PUTTING

### PATENTS IN THEIR PROPER PLACE

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### INTRODUCTION

By most measures, the numbers are pretty impressive. In fiscal year 2003 alone, 165 U.S. universities collectively reaped \$1.3 billion in gross licensing income, formed 374 new companies, executed 4,464 licenses, and were issued 3,926 patents, largely as a result of university-industry technology transfer initiatives.<sup>1</sup> By comparison, in 1991, 97

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universities garnered a mere \$130 million in gross licensing income.<sup>2</sup> These increases bring needed revenue to university coffers,<sup>3</sup> stimulate economic growth in surrounding municipalities,<sup>4</sup> and provide beneficial products to consumers here and abroad.<sup>5</sup>

But these achievements have not come without a cost to academia. Historically, universities have existed for the purpose of promoting inquiry and advancing the sum of human knowledge.<sup>6</sup> To further these goals, university researchers would publish and present their scientific findings as soon as possible in accordance with communal norms promoting the prompt and open sharing of data. But today, academic researchers are being encouraged by technology transfer offices (“TTOs”) and industry sponsors to delay publishing and presenting their work until after filing a patent application and sometimes even longer than that.<sup>7</sup> In addition, the growth in patent-related litigation involving

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<sup>1</sup> AUTM Licensing Survey, *cited in* Jeff Karoub, *Industry Experts Shed Light on Technology Transfer*, Small Times, at [http://www.smalltimes.com/document\\_display.cfm?document\\_id=8456](http://www.smalltimes.com/document_display.cfm?document_id=8456) (Nov. 29, 2004).

<sup>2</sup> Wesley M. Cohen, *Patents and Appropriation: Concerns and Evidence*, 30 J. TECH. TRANSFER 57, 60 (2005).

<sup>3</sup> For example, the Wisconsin Alumni Research Foundation (“WARF”), which handles technology transfer for the University of Wisconsin-Madison, has contributed approximately \$750 million to fund basic research at the university over the past 80 years. *See Patent Law Reform: Hearings Before the Subcomm. on Courts, the Internet, and Intellectual Property of the House Judiciary Committee* (June 9, 2005) (statement of Carl Gulbrandsen, Managing Director, WARF).

<sup>4</sup> The impact on state and local economies can be quite important. The Wisconsin Alumni Foundation also boasts that “[t]o date, more than 30 companies based on WARF technology have spun out of the university, with all but one of them based in Wisconsin.” *Guide Offers Aid to Campus Entrepreneurs* (Apr. 14, 2004) <<http://www.news.wisc.edu/9666.html>>. (ADD MORE CITES)

<sup>5</sup> The website of the Association of University Technology Managers (AUTM) contains a 25+ page list of “product stories” describing successful university-generated products and programs. *See* Association of University Technology Managers, *Product Stories* (last visited Sept. 21, 2005) <[http://www.autm.net/aboutTT/aboutTT\\_prodStory.cfm](http://www.autm.net/aboutTT/aboutTT_prodStory.cfm)>.

<sup>6</sup> *1915 Declaration of Principles on Academic Freedom and Academic Tenure*, in AMERICAN ASSOCIATION OF UNIVERSITY PROFESSORS (AAUP), *POLICY DOCUMENTS AND REPORTS 3* (9th ed. 2001), *cited in* Robert C. Post, *The Structure of Academic Freedom* (draft book chapter on file with the author). The two other purposes are “to provide general instruction to the students; and to develop experts for various branches of the public service.” *See also* Charles C. Caldert, *Industry Investment in University Research*, 8 *Sci Tech. & Hum. Values* 24, 30-30 (year?) (noting a fundamental tension between the proper role of universities and the profit motive), *cited in* Joshua A. Newberg & Richard L. Dunn, *Keeping Secrets in the Campus Lab: Law, Values, and Rules of Engagement for Industry-University R&D Partnerships*, 39 *AM. BUS. L.J.* 187, 188 (2002).

<sup>7</sup> *See, e.g.,* Lana M. Knedlik, *Publishing: How Your Rights Could Perish* (Sept. 2, 2004) <http://www.stinsonmoheck.com/ns/ArticleDetail.cfm?AID=26> (“Whether you are a sophisticated university or a lone inventor, the point is that publishing your work may not always be a good idea. . . . university researchers should be careful about making any sort of public disclosure or risk losing patent rights (and ability to profit from them) forever.”); Lauren Maclanahan, *Technology Transfer Buzz: Things to Know About Information Disclosures*, at 6 (Fall 2004), <[http://otl.grc.gatech.edu/OTL\\_Fall\\_2004.pdf](http://otl.grc.gatech.edu/OTL_Fall_2004.pdf)>; Laura Heisler, *Be Aware: Public Disclosure Can Affect Patentability*, Wisconsin Alumni Research Foundation, at <http://http://www.warf.org/news/newsletters-article.jsp?articleid=175> (Feb. 7, 2005);

universities<sup>8</sup> and the much hyped “tragedy of the anticommons” in the patenting of basic research tools are both costs attributable, at least in part, to technology transfer initiatives.<sup>9</sup> While not amenable to precise quantification, the stifling of discourse and the erosion in the norms of sharing and colloquy historically associated with the scholarly enterprise, are costs that must be balanced against the technology transfer gains.<sup>10</sup>

Both the impressive numbers and the negative side effects are usually traced to the 1980 Bayh-Dole Act, which allows universities to elect ownership of inventions developed with federal funds, enabling them to offer exclusive licenses to companies interested in commercializing the inventions.<sup>11</sup> The impetus for Bayh-Dole was a belief that the ivory tower was stuffed with useful technologies that could meet societal needs and stimulate economic progress if appropriate incentives, e.g., exclusive rights, could be provided for private industry to commercialize them.<sup>12</sup> While not without critics, Bayh-

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<sup>8</sup> See, e.g., *Madey v. Duke Univ.*, 307 F.3d 1351 (Fed. Cir. 2002), *cert. denied*, 123 S. Ct. 2639 (2003); *Iowa State Univ. Research Found., Inc. v. Wiley Organics, Inc.*, 2005 U.S. App. LEXIS 3694 (Fed. Cir. 2005); *Eolas Techs. v. Microsoft Corp.*, 399 F.3d 1323 (Fed. Cir. 2005); *Univ. of Rochester v. G.D. Searle & Co.*, 375 F.3d 1303 (Fed. Cir. 2004); Eli Kinitsch, *Yale Wins Suit Against Nobel Laureate*, 215 SCIENCE NOW 1 (2005), at <http://sciencenow.sciencemag.org/cgi/content/full/2005/214/1>.

<sup>9</sup> See, e.g., ADAM B. JAFFE & JOSHUA LERNER, *INNOVATION AND ITS DISCONTENTS: HOW OUR BROKEN PATENT SYSTEM IS ENDANGERING INNOVATION AND PROGRESS AND WHAT TO DO ABOUT IT* (2003); Rebecca S. Eisenberg & Michael A. Heller, *Can Patents Deter Innovation? The Anticommons in Biomedical Research*, *Science* 280:698-701 (1998).

<sup>10</sup> See, e.g., Arti K. Rai, *Regulating Scientific Research: Intellectual Property Rights and the Norms of Science*, 94 NW. U. L. REV. 77, 79 (1999) [hereinafter Rai, *Regulating Scientific Research*] (noting that changes in intellectual property law have undermined scientific research norms), Rebecca S. Eisenberg, *Academic Freedom and Academic Values in Sponsored Research*, 66 TEX. L. REV. 1363 (1988) (discussing sponsored research agreement restrictions on dissemination of academic results). Other costs, also difficult to quantify, include the loss to U.S. universities and the domestic economy of jobs and industry research funds as U.S. companies, frustrated by the difficulty of working with U.S. university TTOs, send jobs and dollars to overseas institutions with their growing corps of highly skilled researchers. See, e.g., Wayne C. Johnson, *Globalization of Research and Development in a Federated World*, in REINVENTING THE RESEARCH UNIVERSITY 159, 164 (2004) (“[L]arge U.S. based corporations have become so disheartened and disgusted with the situation [i.e. negotiating intellectual property rights with U.S. universities] they are now working with foreign universities, . . . which are more than willing to offer extremely favorable intellectual property terms”); Robert Killoren & Susan B. Butts, *Industry-University Research in Our Times*, National Academies Government-University-Industry Research Roundtable, at [http://www7.nationalacademies.org/guirr/ip\\_background.html](http://www7.nationalacademies.org/guirr/ip_background.html) (Jun. 26, 2003);

<sup>11</sup> Pub. L. No. 96-517, 94 Stat. 3015-28 (codified as amended at 35 U.S.C. 200-211, 301-307 (1994)) (commonly known as the Bayh-Dole Act). Of course there are myriad factors that have contributed to the technology transfer boom including reductions in federal and state funding to universities, influence of corporate America on universities, and advances in technology such as the discovery of DNA and creation of the field of biotechnology. A full discussion of all such factors is beyond the scope of this Article, which focuses on patent-related impacts on technology transfer.

<sup>12</sup> See NIH: *Moving Research from the Bench to the Bedside: Hearings Before the Subcomm. on Health of the Committee on Energy and Commerce*, 108 Cong. (2003) (statement of Sherrod Brown, D-OH) [hereinafter *From the Bench to the Bedside*] (“Congress has long recognized that the value of an idea is in using it.”).

Dole is widely seen as a success and many foreign countries are implementing changes to their laws to mirror its policies.<sup>13</sup>

Bayh-Dole and other enabling legislation are evidence of a Congressional desire to facilitate technology transfer between universities and industry by using patent policy, with the ultimate goal of benefiting the public.<sup>14</sup> But luring academics into this brave new world of patents and royalties has created some unintended side effects. For example, university research often progresses in stages and the traditional model of scholarly discourse involves the presentation and publication of research conclusions and insights at those various stages. Yet the rigid patent novelty rules directly conflict with this model by requiring that a patent application be filed either before or within 12 months of the public exposure of the invention (depending on the country) to avoid loss of the right to a patent.<sup>15</sup> These rules constrain researcher behavior in ways that are not conducive to academic discourse.

The unforgiving nature of patent novelty rules encourages a culture in which the dissemination of even very early stage research, sometimes no more than a proof of concept, is delayed while a provisional patent application is prepared by the university TTO. As a result, secrecy is on the rise among academic researchers, particularly in the life sciences, with many university scientists choosing to limit and/or delay disclosures of their work in order to participate in the patent/technology transfer arena.<sup>16</sup> For example, in 1966, 50% of surveyed experimental biologists felt safe in sharing information on current research with others; only 26% felt that way by 1998.<sup>17</sup> In a recent study of geneticists, 35% perceived academic scientists as somewhat or much less willing to share information and data than a decade ago, 58% reported adverse data withholding effects

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<sup>13</sup> See, e.g., *AUTM Licensing Survey: FY 2003 Survey Summary*, Association of University Technology Managers, at <http://www.autm.net/surveys/dsp.surveyDetail.cfm?pid=16> (visited Oct. 9, 2005) (citing announcements by the United Kingdom, Canada, Germany and Japan of investment programs and/or statutory changes to enhance the commercialization of research from academic institutions as foreign countries “continue to strive to emulate U.S. success in harnessing the intellectual output of its academic institutions.”); *Patent Law Reform: Hearings Before the Subcomm. on Courts, the Internet, and Intellectual Property of the House Judiciary Committee* (June 9, 2005) (statement of Carl Gulbrandsen, Managing Director, WARF) (noting that “at WARF, we receive numerous visitors each year from around the world. Invariably our foreign visitors ask about Bayh-Dole and express the wish that their own countries would adopt such forward-thinking legislation.”).

<sup>14</sup> Congress’ most recent effort in this area, the Collaborative Research and Technology Enhancement Act of 2004 (“the CREATE Act”), is designed to encourage research collaborations between academic institutions and private enterprises by making it easier for the partners to obtain patents on inventions created by joint inventors from both organizations. See Part II, *infra*.

<sup>15</sup> 35 U.S.C. §§102(b).

<sup>16</sup> See, e.g., Jeremy M. Grushcow, *Measuring Secrecy: A Cost of the Patent System Revealed*, 33 J. LEGAL STUD. 59, 82 (2004) (presenting data on the increased secretiveness of university researchers between 1980 and 1990); John P. Walsh & Wei Hong, *Secrecy is Increasing in Step with Competition*, 422 NATURE 801, 802 (2003).

<sup>17</sup> John P. Walsh & Wei Hong, *Correspondence: Secrecy is Increasing in Step with Competition*, 422 NATURE 801, 802 (2003), available at [www.nature.com](http://www.nature.com).

on their own research, and 56% reported adverse data withholding effects on the education of students and post-doctoral researchers.<sup>18</sup>

While these statistics are troubling, other judicial, legislative, and commercial developments point toward an even bleaker future for academic discourse in the sciences. The recent decision by the Court of Appeals for the Federal Circuit in *In re Klopfenstein* seems sure to result in a further stifling of scholarly discourse prior to the filing of patent applications.<sup>19</sup> There the court expanded the scope of patent-invalidating prior art by broadly interpreting the phrase “printed publication” to include fairly ephemeral scientific poster presentations. The decision is significant because previous decisions had required distribution of at least some copies or the indexing and cataloguing of at least one physical copy of a reference before considering such information to be patent-defeating prior art.<sup>20</sup>

On the legislative front, recently introduced patent reform measures, which include creation of a “winner takes all” race to the patent office, and elimination of the best mode requirement, promise a further deterioration of the traditional sharing norms of university researchers while offering little if any concomitant benefit to this group of inventors.<sup>21</sup> Moreover, Emory University’s recent announcement of its \$525 million sale of intellectual property, considered to be the largest such sale in the history of American higher education, is likely to further fan the flames of interest in technology transfer initiatives at other institutions desirous of obtaining new funds for various endeavors.<sup>22</sup>

Much has been written on the myriad problems associated with the Bayh-Dole Act in relation to the over-zealous patenting, litigation, and licensing practices of some university TTOs leading to access issues for upstream research tools, increased secrecy among university scientists, and more.<sup>23</sup> To address these perceived problems, several

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<sup>18</sup> Eric G. Campbell, et. al., *Data Withholding in Academic Genetics*, 287, No. 4, J. OF THE AM. MED. ASSN 473, 478 (January 23/30, 2002). This is not to suggest that increasing secrecy is solely the result of the patent novelty rules. There are a variety of contributing factors, such as the widespread inclusion of secrecy clauses in industry sponsorship agreements, and the increasingly competitive nature of academic research in general. Nevertheless, the potential of the patent novelty rules to encourage this kind of behavior cannot be ignored.

<sup>19</sup> See *In Re Klopfenstein*, 380 F.3d 1345, 1352 (Fed. Cir. 2004).

<sup>20</sup> *Id.*

<sup>21</sup> See Patent Act of 2005, H.R. 2795, 109th Cong. (2005).

<sup>22</sup> See Clifton Leaf, *The Law of Unintended Consequences*, Fortune, at <http://www.fortune.com/fortune/print/0,15935,1101810,00.html> (Sept. 7, 2005).

<sup>23</sup> See, e.g., Rebecca S. Eisenberg, *Public Research and Private Development: Patents and Technology Transfer in Government-Sponsored Research*, 82 VA. L. REV. 1663, 1727 (1996); Arti K. Rai & Rebecca S. Eisenberg, *Bayh-Dole Reform and the Progress of Biomedicine*, 66 L. & CONTEMP. PROBS. 289, 291 (2003) (arguing for reformation of Bayh-Dole to give funding agencies greater discretion in mandating non-exclusive licensing of federally funded inventions); Gary Stix, *Razing the Tollbooths* <Scientific American, [www.sciam.com](http://www.sciam.com)> (same); MOWERY, NELSON, SAMPAT & ZIEDONIS, *IVORY TOWER AND INDUSTRIAL INNOVATION: UNIVERSITY-INDUSTRY TECHNOLOGY BEFORE AND AFTER THE BAYH-DOLE ACT 9-34* (2004) (proposing changes both to Bayh-Dole and other areas of patent law such as heightened subject matter and utility requirements and a statutory experimental use exemption); Diane M. Sidebottom,

commentators have called for reformation of the Act, as well as other changes to the patent system such as heightening the subject matter and utility standards and creating a statutory experimental use exemption to patent infringement.<sup>24</sup> These meritorious proposals could, if implemented, have the effect of improving some aspects of the current university patenting regime.<sup>25</sup> However, even if enacted, such reforms likely would have little if any effect on the increasing secrecy among academic researchers because they do not address the underlying causes of that problem.

I contend that taking Bayh-Dole as a given, in an amended or unamended form, leads to a different focus for addressing the deterioration in disclosure norms in academia: building flexibilities into the novelty rules of U.S. and foreign patent systems, which currently are not tailored to accommodate the needs, values, and realities of academic enterprises.<sup>26</sup> Surprisingly little, if any, real attention has been focused on modifying these rules that, along with restrictive terms in industry sponsorship agreements, are at the root of the increased secrecy permeating academia today. Twenty-five years after the passage of the Bayh-Dole Act, patents and technology transfer are firmly entrenched in academia,<sup>27</sup> but instead of being a simple aid to the dispersion and implementation of university discoveries, patent rules too often are dictating the pace,

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*Updating the Bayh-Dole Act: Keeping the Federal Government on the Cutting Edge*, 30 PUB. CONT. L.J. 225 (2001); Scott D. Locke, *Patent Litigation Over Federally Funded Inventions and the Consequences of Failing to Comply with Bayh-Dole*, 8 VA. J.L. & TECH. 3 (2003); Peter Mikhail, *Hopkins v. CellPro: An Illustration that Patenting and Exclusive Licensing of Fundamental Science is Not Always in the Public Interest*, 13 HARV. J.L. & TECH. 375 (2000); Clovia Hamilton, *University Technology Transfer and Economic Development: Proposed Cooperative Economic Development Agreements Under the Bayh-Dole Act*, 36 J. MARSH. L. REV. 397 (2003); William L. Geary, *Protecting the Patent Rights of Small Businesses: Does the Bayh-Dole Act Live Up to Its Promise?*, 22 PUB. CONT. L.J. 101 (1992); Clifton Leaf, *The Law of Unintended Consequences*, *Fortune*, at <http://www.fortune.com/fortune/print/0,15935,1101810,00.html> (Sept. 7, 2005) (arguing for amendment of Bayh-Dole to require broad licensing of federally funded inventions).

<sup>24</sup> *See id.*

<sup>25</sup> Bayh-Dole's perceived successes have made it quite popular with members of Congress, universities and other interest groups, and more than minimal changes to the current Act seem unlikely in the near term. This is because, while patent reform legislation is currently pending before Congress, it does not include meaningful changes to Bayh-Dole. Moreover, the CREATE Act in 2004 provided the ideal opportunity for Congress to address issues with Bayh-Dole since the legislation specifically related to enhancing the Bayh-Dole Act's technology transfer mandate, yet none of the abovementioned commentator reforms were included in that legislation. Instead, the Bayh-Dole Act was uniformly praised in congressional remarks. *See, e.g.*, The Cooperative Research and Technology Enhancement Act of 2004, S. 2192, 108th Cong. (enacted) (Statements of Senators Specter and Leahy, and Representative Berman).

<sup>26</sup> *But see* Mark A. Lemley & Dan L. Burk, *Is Patent Law Technology Specific?* 17 *Berkeley Tech. L. J.* 1155 (2002).

<sup>27</sup> *See generally* Rebecca S. Eisenberg, *Public Research and Private Development: Patents and Technology Transfer in Government-Sponsored Research*, 82 VA. L. REV. 1663, 1727 (1996) (noting that "[t]he present policy of promoting patents on federally-supported inventions has become rapidly entrenched in U.S. law" and that "[r]etreating from the policy may be difficult at this stage. Research performers have adjusted to the incentives created by current policy. When government policy creates and distributes new property rights, it is inevitable that someone will protest if those rights are later taken away.").

form, and scope of discourse and sometimes even the direction of the research itself. In a society that values the public benefits occasioned both by prompt and open scholarly discourse and by the patenting of commercializable inventions, these developments are particularly troubling. Researchers should not have to choose between engaging in early academic discourse and obtaining proprietary rights.

I suggest that to begin reversing the observed deterioration in disclosure norms, flexibilities must be built into the patent system so that patents can be facilitators, not controllers, of the academic knowledge dissemination enterprise. In particular, I advocate the creation of an opt-in extended grace period which would provide more time for academic researchers to publish and present early stage research before having to file a patent application. Such an extension, coupled with early application publication and a meaningful experimental use exemption, would allow researchers to engage in traditional academic discourse while retaining the ability to obtain proprietary rights necessary for commercialization of their inventions. Importantly, it would also provide early disclosure of discoveries for other scientists to build upon.

Part I of this Article provides a context for discussing issues relating to academic discourse and proprietary rights by highlighting key changes in the historical relationship between the academy and the public good prompted by the intrusion of proprietary rights. Part II then considers the impact of changes in patent law and policy on scientific discourse in the academy. It looks first at positive benefits occasioned by the changes and then at several of the costs engendered by the patent and technology transfer boom within U.S. universities in the 25 years since enactment of Bayh-Dole. Proposals for putting patents in their proper place are the focus of Part III, which includes discussion of a statutory amendment designed to ameliorate the effects of patent prior art rules on the dissemination of early stage university research by allowing university researchers the option of an extended prior art grace period in exchange for immediate application publication. The proposals aim to increase prompt and full academic discourse while balancing a researcher's ability to obtain patent protection with third party needs for certainty regarding publicly available information. Part III also addresses controversial aspects of the proposals, including their relation to current patent reform and harmonization efforts taking place in the U.S. and abroad. The Article concludes that for norms of scientific scholarly discourse to regain traction in the academy, patents must move out of the limelight and into a supporting role, which is their proper place.

## I. THE ACADEMY AND THE PUBLIC GOOD: A CHANGING RELATIONSHIP

*Institutions of higher education are conducted for the common good and not to further the interest of either the individual teacher or the*

*institution as a whole. The common good depends upon the free search for truth and its free exposition.*<sup>28</sup>

This statement reflects the traditional view of universities as institutions dedicated to the advancement of the common good.<sup>29</sup> This advancement or “progress” requires “complete and unlimited freedom to pursue inquiry and publish its results. Such freedom is the breath in the nostrils of all scientific activity.”<sup>30</sup> Academic freedom manifests itself in scholarly articles, books, and presentations that are useful for the researcher (e.g., in getting a job, or getting tenure) and for the interested academic or industry audience seeking to build on foundational work.

#### A. HISTORICAL NORMS

Historically, researchers choosing an academic career made a clear choice, academic freedom over monetary reward:

The professor opts to forgo the fast-paced and often stressful environment found in an industrial research and development department and the high salary that accompanies that position. Instead, professors are attracted to the chance to pursue similar interests in an academic arena where they are also endowed with freedom to research topics of their choice.<sup>31</sup>

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<sup>28</sup> *1940 Statement of Principles on Academic Freedom and Tenure*, American Association of University Professors, at <http://www.aaup.org/com-a/index.htm> (visited July 1, 2005).

<sup>29</sup> There are many ways in which universities have contributed to the public good in the U.S. and abroad throughout history. The contributions of American Universities to industry, agriculture, pharmaceuticals, and local community development, as well as the training of a skilled workforce are well documented. A useful discussion of this topic is provided in MOWERY, NELSON, SAMPAT & ZIEDONIS, *IVORY TOWER AND INDUSTRIAL INNOVATION: UNIVERSITY-INDUSTRY TECHNOLOGY BEFORE AND AFTER THE BAYH-DOLE ACT* 9-34 (2004).

<sup>30</sup> *Id.* at 13. For a cogent argument that the concept of academic autonomy unfettered by university administration is no longer tenable in a Bayh-Dole/sponsored research environment, see Rebecca S. Eisenberg, *Symposium on Academic Freedom: Academic Freedom and Academic Values in Sponsored Research*, 66 TEX. L. REV. 1363, 1404 (1988) [hereinafter Eisenberg, *Academic Freedom and Academic Values*] (“The traditional American conception of academic freedom, with its emphasis on defending the professional autonomy of individual faculty members against universities, is ill-adapted to the task of protecting academic values in sponsored research within universities. Research sponsors having interests at odds with traditional academic values may use the lure of research funding to entice academic scientists into serving their interests. It makes little sense to immunize faculty members from institutional supervision and control in their relationships with research sponsors if faculty members cannot be counted on to uphold academic values on their own.”).

(PLACE)“The potential for corruption of academic values is manifest in research sponsored by industry and by the Department of Defense. These sponsors often have a palpable interest in directing the choice of research topics and restricting the publication of research results.” Eisenberg

<sup>31</sup> Sandip H. Patel, Note, *Graduate Students' Ownership and Attribution Rights in Intellectual Property*, 71 IND. L.J. 481, 499 (1995).

Thus in academe “[i]deas, research, and writing are the currency”<sup>32</sup> which, in conjunction with academic freedom and the other intangible benefits of publication and discovery, historically made the academic enterprise rewarding for researchers. The “public credit and kudos” accruing to authors of important scientific publications have provided incentives for early publication of scientific discoveries since Henry Oldenburg introduced the journal *“Philosophical Transactions of the Royal Society of London”* in 1665.<sup>33</sup> Of course, the public has benefited from this norm of open disclosure as well. As noted by the National Academy of Science’s Committee on Responsibilities of Authorship in the Biological Sciences,

[T]he power of the principles first established by Henry Oldenburg and the *Philosophical Transactions of the Royal Society* in 1665 remain undiminished. The rewards of publication counterbalance inclinations to secrecy. Oldenburg’s simple idea created an ethic of open disclosure of scientific results that has lasted for centuries and served to move science forward.<sup>34</sup>

Prompt dissemination of research hypotheses, results, and methodologies through scientific presentations and publication has provided the foundation for advances and discoveries in numerous scientific fields that have benefited humanity.<sup>35</sup> The sociologist Robert Merton characterized academic scientific research as a communal enterprise with free sharing and critiquing of results among community members.<sup>36</sup> As one commentator explains, “[t]he speed of progress is greatly enhanced by virtue of the fact the practitioners of science publish not only results, but methodology, and techniques. . . . This not only helps ‘bootstrap’ others into the field, to learn from the example set, but makes it possible for others to verify or refute the results (or techniques) under investigation.”<sup>37</sup> Sir Isaac Newton’s classic statement “[i]f I have seen further it is by

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<sup>32</sup> Lisa G. Lerman, *Misattribution in Legal Scholarship: Plagiarism, Ghostwriting, and Authorship*, 42 S. TEX. L. REV. 467, 478 (2001).

<sup>33</sup> See Matthew Rimmer, *Japonica Rice: Intellectual Property, Scientific Publishing and Data-sharing*, 23 PROMETHEUS 325 (2005).

<sup>34</sup> Committee on Responsibilities of Authorship in the Biological Sciences, *Sharing Publication-Related Data and Materials: Responsibilities of Authorship in the Life Sciences*, National Academies Press (2003), cited in Matthew Rimmer, *Japonica Rice: Intellectual Property, Scientific Publishing and Data-sharing*, 23 PROMETHEUS 325 (2005).

<sup>35</sup> For example, Emory University researcher Dr. Ray Schinazi, co-inventor of the blockbuster drug Emtriva, claims to have gotten the idea for the new compound from hearing a presentation by Canadian researcher Bernard Belleau at an AIDS conference in Montreal. See Clifton Leaf, *The Law of Unintended Consequences*, *Fortune*, at <http://www.fortune.com/fortune/print/0,15935,1101810,00.html> (Sept. 7, 2005).

<sup>36</sup> ROBERT K. MERTON, *The Normative Structure of Science*, in *THE SOCIOLOGY OF SCIENCE* (1973).

<sup>37</sup> Con Zymaris, *Shoulders of Giants -- A Paper on the Inevitability of Open Source Dominance* (last modified Mar. 23, 2004) <<http://www.cyber.com.au/users/conz/shoulders.html#1>>.

standing on the shoulders of giants”<sup>38</sup> visually captures the concept of cumulative learning from open science.

However, in the past 25 years, explicit and implicit evisceration of traditional notions of academic discourse in, and academic reward for, scientific endeavors has proceeded apace. The Bayh-Dole Act mandates that universities share royalties from patented inventions with researchers.<sup>39</sup> This requirement has created a pathway for some faculty to become millionaires, thus eroding, to some extent, the pull of the publication incentive structure.<sup>40</sup> Moreover, many researchers receive study funding from industry sources and such sponsored research agreements often specify a term of secrecy for results generated under the agreement.<sup>41</sup>

Encroachment on traditional sharing norms often now comes from university intellectual property policies codified in faculty handbooks, and in the instructions of TTO personnel to vet inventive work through the office before publishing or presenting it to avoid the loss of potential patent rights.<sup>42</sup> In addition, with increasing numbers of academic researchers creating start-up companies to license and commercialize the faculty member’s patented inventions, there has been a steady blurring of the lines between academic and industry research and their concomitant rewards. Universities have had to create conflict of interest policies to address these new revenue-generating incentive sources that can detract from faculty members fulfilling their traditional teaching, training, and disseminating duties in the academy. And all of these changes are developing in the name of the common good, the public interest, under the new regime of

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<sup>38</sup> Isaac Newton, Letter to Robert Hooke, 1676.

<sup>39</sup> 35 U.S.C. §202(c)(7).

<sup>40</sup> For example, under G Intellectual Property Policy, inventors receive 100% of net royalties up to \$25,000, 33% of net revenue up to \$4 million, and 25% of net revenue over \$4 million. Consequently, Emory’s \$540 million Emtriva sale made the three faculty inventors millionaires. *See* Emory University Intellectual Property Policy, document on file with the author.

<sup>41</sup> *See* Jerry G. Thursby and Marie C. Thursby, *Who Is Selling the Ivory Tower? Sources of Growth in University Licensing*, 00 MGMT. SCI. 1, 4 (2001) As reported by Thursby & Thursby: “Half of the firms in our industry survey noted that they include delay of publication clauses in at least 90% of their university contracts . . . . The average delay is nearly four months, and some firms require as much as a year’s delay.”

<sup>42</sup> *See* GARY RHOADES AND SHEILA SLAUGHTER, *ACADEMIC CAPITALISM AND THE NEW ECONOMY* 115-116 (2004). The authors quote an assistant biology professor describing the problem:

If you think you have something commercially relevant, you are required to file a disclosure to the university before you publish it. So they are essentially . . . censoring what is being published . . . the university . . . is in business too . . . so it’s annoying in one respect because being in academics, you need to have all this freedom, but if you actually read the university faculty handbook . . . anything that you think is commercially relevant has to be filed first and then they have up to six months to decide the fate of what you are working on . . . and that includes presentations at meetings. So, I don’t know. The lines between industry and universities are sort of merging.

*See also* discussion *infra* at \_\_\_\_\_.

academic capitalism which “proposes that the market rules, and that its operation serves the interests of higher education and the larger society.”<sup>43</sup>

## B. SAME END, NEW MEANS

The new academic capitalism has created philosophical and practical quandaries for researchers. The philosophical conundrum arises from the tension between the lofty goals of academe’ and the lure of materialism. As Derek Bok, former President of Harvard University, notes, “[s]cholars, especially those in the traditional disciplines, have deliberately chosen academic life in preference to the ways of commerce, in part because they look upon the search for truth and knowledge as a worthier calling than the quest for material wealth.”<sup>44</sup>

Nevertheless, academe is now enhancing the common good through the increased transfer of technology from its hallowed halls to the marketplace through industry collaborations facilitated by changes in patent policy.<sup>45</sup> Supporters of this new “means” to the historical “end” of benefiting the common good cite the numerous research parks, collaborations, patents, start-up companies, and consumer products made possible by the new academic capitalism.<sup>46</sup> For example, the website of the Association of University Technology Managers (AUTM) contains a 25+ page list of “product stories” describing successful university-generated products and programs.<sup>47</sup> Detractors, however, note that several of these blockbuster innovations did not require patent protection for dissemination, that fundamental discoveries would have been widely used without patents, and that patents in fact exact a toll on the use of the technology.<sup>48</sup> Regardless, the impact of the widespread introduction of patenting and technology transfer at U.S. universities has been substantial; creating many lauded benefits but also many controversial costs.

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<sup>43</sup> Gary Rhoades, *Capitalism, Academic Style, and Shared Governance*, Academe, at <http://www.aaup.org/publications/Academe/2005/05mj/05mjrhoa.htm> (visited July 1, 2005).

<sup>44</sup> DEREK C. BOK, *UNIVERSITIES IN THE MARKETPLACE: THE COMMERCIALIZATION OF HIGHER EDUCATION* 18 (2003) [hereinafter BOK, *UNIVERSITIES IN THE MARKETPLACE*].

<sup>45</sup> GARY RHODES AND SHEILA SLAUGHTER, *ACADEMIC CAPITALISM AND THE NEW ECONOMY* 115-116 (2004) (discussing the pattern observed in many university IP policies of expressing “values of the competing knowledge regimes of public good and academic capitalism.”).

<sup>46</sup> See, e.g., *AUTM Licensing Survey: FY 2003 Survey Summary*, Association of University Technology Managers, at <http://www.autm.net/surveys/dsp.surveyDetail.cfm?pid=16> (visited Oct. 9, 2005), See, e.g., *Patent Law Reform: Hearings Before the Subcomm. on Courts, the Internet, and Intellectual Property of the House Judiciary Committee* (June 9, 2005) (statement of Carl Gulbrandsen, Managing Director, WARF). See, e.g., *The Cooperative Research and Technology Enhancement Act of 2004*, S. 2192, 108th Cong. (enacted) (statements of Senators Arlen Specter & Patrick Leahy).

<sup>47</sup> See Association of University Technology Managers, *Product Stories* (last visited Sept. 21, 2005) <[http://www.autm.net/aboutTT/aboutTT\\_prodStory.cfm](http://www.autm.net/aboutTT/aboutTT_prodStory.cfm)>.

<sup>48</sup> See, e.g., MOWERY, NELSON, SAMPAT & ZIEDONIS, *IVORY TOWER AND INDUSTRIAL INNOVATION: UNIVERSITY-INDUSTRY TECHNOLOGY BEFORE AND AFTER THE BAYH-DOLE ACT* 9-34 (2004); Gary Stix, *Razing the Tollbooths* *Scientific American*, <<http://www.sciam.com>>..

## II. THE IMPACT OF PATENT LAW AND POLICY

Congress has many levers at its disposal to effectuate public policy, and patent law is one of them.<sup>49</sup> The choice of patent law as the policy tool to address the dearth of industry interest in university generated research is explicitly affirmed in the text of the Bayh-Dole Act: “[i]t is the policy and objective of the Congress to use the patent system to promote the utilization of inventions arising from federally supported research or development.”<sup>50</sup> Results of this choice are visible in the AUTM Licensing Survey statistics detailing the continuing increases in inventions disclosed, patents obtained, licenses executed, start-ups created, and products commercialized.<sup>51</sup> Less visible, but no less important, are the impacts on the culture and norms of academic research in universities engaging in the technology transfer enterprise.

### A. BENEFITS TO TECHNOLOGY TRANSFER

On several occasions Congress has revised the patent statute to better aid the public good, but very few amendments have had as significant and widespread an impact as the Bayh-Dole Act of 1980.<sup>52</sup> While not solely responsible for the technology transfer boom of the past several years, the impact of the Act has been profound. Bayh-Dole, and later legislation to explicitly benefit and promote collaborative research initiatives between university and industrial sector entities, is a clear example of Congressional efforts to promote the commercialization of university generated technology.<sup>53</sup>

#### i. Bridging the Gap: Bayh-Dole

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<sup>49</sup> “Policy tools like patents, the Bayh-Dole Act, the Stevenson-Wydler Act, and incentives for commercialization, are important links in the bench to bedside chain” *NIH: Moving Research from the Bench to the Bedside: Hearings Before the Subcomm. on Health of the Committee on Energy and Commerce*, 108 Cong. (2003) (statement of Sherrod Brown, D-OH) [hereinafter *From the Bench to the Bedside*].

<sup>50</sup> 35 U.S.C. §200 (2005).

<sup>51</sup> See *AUTM Licensing Survey: FY 2003 Survey Summary*, Association of University Technology Managers, at <http://www.autm.net/surveys/dsp.surveyDetail.cfm?pid=16> (visited Oct. 9, 2005).

<sup>52</sup> For example, the 1836 Patent Act instituted an examination system into the U.S. patent regime, replacing the flawed registration system of the 1793 Act. Also, the 1952 Patent Act contained the first statutory codification of the non-obviousness requirement, designed to eliminate the vague and subjective “invention” requirement enunciated by some courts and clarify patentability standards for the public.

<sup>53</sup> “Passage of Bayh-Dole conferred not only the right to take title to inventions arising from government-funded research, but also an obligation to commercialize these inventions diligently for the benefit of the public.” *NIH: Moving Research from the Bench to the Bedside: Hearings Before the Subcomm. on Health of the Committee on Energy and Commerce*, 108 Cong. (2003) (statement of Dr. Andrew Neighbour, Vice Chancellor for Research, UCLA ).

The year 1980 ushered in the era of technology transfer-related academic capitalism for U.S. universities with two landmark events, one legislative, the Bayh-Dole Act,<sup>54</sup> and one judicial, the United States Supreme Court's *Diamond v. Chakrabarty* decision.<sup>55</sup> Two years later, Congress gave technology transfer an additional, albeit perhaps inadvertent, boost with the creation of the Court of Appeals for the Federal Circuit.<sup>56</sup> These three events coincided with significant technological discoveries in biotechnology and computer science which combined to lead to a dramatic increase in patenting, licensing, and entrepreneurial activities on U.S. campuses.<sup>57</sup>

When Congress passed the Bayh-Dole amendments to the Patent Act in 1980, it gave universities presumptive title to inventions produced with federal funds, as long as they complied with specific requirements.<sup>58</sup> By allowing patent title to initially vest in universities, the Bayh-Dole Act paved the way for more interaction between universities and companies which could now obtain exclusive licenses to such patents and commercialize academic research that previously might have lain dormant and unused.<sup>59</sup>

In a prepared statement before a congressional subcommittee, Dr. Phyllis Gardner, Associate Professor of Medicine at Stanford University, succinctly outlined the pre-Bayh-Dole problem:

Prior to Bayh-Dole, federal agencies would rarely relinquish ownership of federally funded inventions to academic and private institutions, even when private sector scientists and engineers actually contributed to the inventions. Valuable technology was left languishing on the shelves of research institutions. For example, in the 1960s, the U.S. government asserted that it owned rights to 5-fluorouracil (an important anti-cancer drug) even though it had provided merely a fraction of the funding that went into discovery. As a result, market entry of this critical

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<sup>54</sup> Pub. L. No. 96-517, 94 Stat. 3015-28 (codified as amended at 35 U.S.C. 200-211, 301-307 (1994)).

<sup>55</sup> *Diamond v. Chakrabarty*, 447 U.S. 303, 313 (1980).

<sup>56</sup> See Federal Courts Improvement Act of 1982, Pub. L. No. 97-164, 96 Stat. 25 (codified as amended at 28 U.S.C. §§41-49 (1982)).

<sup>57</sup> See Wesley M. Cohen, *Patents and Appropriation: Concerns and Evidence*, 30 J. TECH. TRANSFER 57, 59 (2005) (including the 1984 Hatch-Waxman Act and the 1988 Process Patent Amendments Act as contributors to the pro-patent era).

<sup>58</sup> See 35 U.S.C. §§200-211.

<sup>59</sup> Useful summaries of the history of the Bayh-Dole Act and the varying forces leading up to its enactment can be found in: MOWERY, NELSON, SAMPAT & ZIEDONIS, *IVORY TOWER AND INDUSTRIAL INNOVATION: UNIVERSITY-INDUSTRY TECHNOLOGY BEFORE AND AFTER THE BAYH-DOLE ACT* 9-34 (2004); and Rebecca S. Eisenberg, *Public Research and Private Development: Patents and Technology Transfer in Government-Sponsored Research*, 82 VA. L. REV. 1663 (1996).

product was unnecessarily delayed and industry distanced itself from federally funded university research.<sup>60</sup>

The impetus for Bayh-Dole was the belief that a wealth of basic, useful research developed in U.S. universities was languishing in those ivory towers as it took, on average, 15-20 years for basic research disclosed in publications to result in marketed products.<sup>61</sup> This delay was attributed to reluctance by private industry to invest in commercializing federally funded research because they could not obtain exclusive rights to it.<sup>62</sup> Such reluctance created a “death valley” between publicly funded research and its commercialization by the private sector. The Bayh-Dole Act provided a “bridge” over this valley by allowing universities to take title to inventions developed with federal funds and grant exclusive licenses to entities willing to commercialize such technology.<sup>63</sup> As a result, “[t]he old system has been replaced by a new federated model involving collaborative work at various corporate, government, and academic labs. The time between new inventions and product roll-outs is collapsing.”<sup>64</sup>

Goals for Bay-Dole were largely unexceptional and included expediting the transfer of publicly supported R&D results to the marketplace by promoting collaborations between universities and industry, increasing small business participation in federal R&D efforts, and creating new jobs and profits for regional economies through the commercialization of inventions made in the United States.<sup>65</sup> The Act brought to universities the lure of new money, a potential influx of new capital from licensing revenue derived from transferred technology. But in order to capitalize on the opportunity, universities had to comply with the myriad rules mandated by Bayh-Dole, such as seeking patents on inventions and licenses to commercialize the inventions.<sup>66</sup> With increasing frequency, universities began establishing TTOs to perform these functions. In 1980, 25 institutions of higher learning were involved in technology transfer; by 1992, that number had climbed to 200. The number of patents issued during

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<sup>60</sup> *NIH: Moving Research from the Bench to the Bedside: Hearings Before the Subcomm. on Health of the Committee on Energy and Commerce*, 108 Cong. (2003) (statement of Dr. Phyllis Gardner, representing the Biotechnology Industry Organization).

<sup>61</sup> MOWERY, NELSON, SAMPAT & ZIEDONIS, *IVORY TOWER AND INDUSTRIAL INNOVATION: UNIVERSITY-INDUSTRY TECHNOLOGY BEFORE AND AFTER THE BAYH-DOLE ACT* 9-34 (2004).

<sup>62</sup> While the funding agency could make the decision to allow licensing, such decisions were rare and were made on a case by case basis resulting in significant uncertainty regarding the likelihood of a favorable result. It was well understood, of course, that commercialization was well beyond the mission, resources, and expertise of university researchers and should be handled by the private sector.

<sup>63</sup> *See also* Stevenson-Wydler Technology Innovation Act of 1980, Pub. L. No. 96-480, 94 Stat. 2311-2320 (codified as amended at 15 U.S.C. 3701-3714 (1994)) (addressing technology transfer in government laboratories).

<sup>64</sup> Wayne C. Johnson, *Globalization of Research and Development in a Federated World*, in *REINVENTING THE RESEARCH UNIVERSITY* 159, 162 (2004).

<sup>65</sup> 35 U.S.C. §200 (2005).

<sup>66</sup> *See The Bayh-Dole Act: A Guide to the Law and Implementing Regulations*, Council on Governmental Relations, at 4, at [http://www.cogr.edu/docs/Bayh\\_Dole.pdf](http://www.cogr.edu/docs/Bayh_Dole.pdf) (last modified Oct., 1999).

that period also jumped--from an average 250 a year to 1,500.<sup>67</sup> Research by Rogers, Ying, and Hartman, suggested a likely impetus for the rapid and widespread adoption of the TTO model by many universities across the country:

The diffusion of technology transfer offices may have been influenced by the so-called "big winner" technologies that have occurred at some universities. Examples are the \$160 million that Michigan State University has earned over the life of two cancer-related patents . . . , the \$37 million that the University of Florida has earned from the sports drink Gatorade, the \$27 million that Iowa State University has been paid for the fax algorithm, and the \$143 million earned by Stanford University for the recombinant DNA gene-splicing patent . . . . A "big winner" can dominate the total license income at a research university; for example, \$18 million of Michigan State University's \$18.3 million license income in FY 1997 came from the two cancer-related drugs.<sup>68</sup>

But very few universities setting up TTOs have seen these types of blockbuster successes. In 2000, about half of the total licensing income generated by all universities was earned by the top five grossing institutions.<sup>69</sup> Creating a patenting culture in a university requires a substantial, long-term investment of resources with no guarantee of success. On average, it takes from 5 to 10 years before a TTO breaks even, and poor management of the office can result in researchers having negative experiences with the technology transfer process that can create ill will that hinders progress for years to come.<sup>70</sup>

While the impact of Bayh-Dole in the technology transfer revolution has been profound, there have also been other changes in patent law and policy that have played a significant role in creating the dual-edged technology transfer sword that is both praised and reviled today.<sup>71</sup> The same year that Congress put technology transfer on the

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<sup>67</sup> MOWERY, NELSON, SAMPAT & ZIEDONIS, *IVORY TOWER AND INDUSTRIAL INNOVATION: UNIVERSITY-INDUSTRY TECHNOLOGY BEFORE AND AFTER THE BAYH-DOLE ACT* (2004). See also discussion *infra* at \_\_\_\_.

<sup>68</sup> Everett M. Rogers, Jing Yin, Joern Hoffmann, *Assessing the Effectiveness of Technology Transfer Offices at U.S. Research Universities*, Association of University Technology Managers, at <http://www.autm.net/pubs/journal/00/assessing.pdf> (visited Oct. 9, 2005).

<sup>69</sup> AUTM Licensing Survey: FY 2000 Survey Summary, available at [http://www.autm.net/events/File/Surveys/3\\_FY2000summary\\_public.pdf](http://www.autm.net/events/File/Surveys/3_FY2000summary_public.pdf) (last visited October 9, 2005).

<sup>70</sup> See Jason Owen-Smith and Walter W. Powell, *To Patent or Not: Faculty Decisions and Institutional Success at Technology Transfer*, 26 J. TECH. TRANSFER 99, 112 (2001) ("faculty decide to patent because of their beliefs about the positive personal and professional outcomes of establishing IP protection. . . . the decision to disclose a new finding . . . depends upon conceptions of the patent benefits, framed by the costs of interacting with licensing professionals and technology transfer offices.")

<sup>71</sup> See, e.g., DEREK C. BOK, *UNIVERSITIES IN THE MARKETPLACE: THE COMMERCIALIZATION OF HIGHER EDUCATION* 11 (2003) [hereinafter BOK, *UNIVERSITIES IN THE MARKETPLACE*]; Richard R. Nelson, *Observations on the Post-Bayh-Dole Rise of Patenting at American Universities*, 26 J. TECH. TRANSFER 13 (2001) [hereinafter Nelson, *Patenting at American Universities*]; Brett M. Frischmann, *Commercializing*

university map with the Bayh-Dole Act, the United States Supreme Court gave it a further boost with its decision in *Diamond v. Chakrabarty*.<sup>72</sup> This case expanded the scope of patent-eligible subject matter to include living organisms, here genetically engineered bacteria, thus jump-starting the fledgling biotechnology industry and further fueling NIH funding of university research in the life sciences.

“Anything under the sun that is made by man” is eligible for patent protection, according to the United States Supreme Court.<sup>73</sup> The Court lifted the phrase from the legislative history of the Patent Act of 1952 as evidence of the broad terrain Congress intended the patent laws to cover. The phrase provided the basis for the Court’s path-breaking conclusion in *Diamond v. Chakrabarty*, that living organisms, namely, a man-made bacterium with properties unlike any known naturally occurring organism, comprised patent eligible subject matter.<sup>74</sup>

The importance of the combined impacts of the *Chakrabarty* decision and the Bayh-Dole Act on the increase in technology transfer-related patenting is significant. As one commentator notes “at roughly the same time universities were permitted to claim intellectual property rights to the fruits of federally funded research as a matter of course, the universe of potentially patentable research results expanded and the potential value of intellectual property increased.”<sup>75</sup> For example, the relaxation of patent subject matter standards meant that universities, often engaged in upstream, early-stage research, could patent embryonic discoveries that, prior to the *Chakrabarty* decision, likely would not have been eligible for patent protection.

Not long after the USSC widened the scope of patent eligible subject matter in *Diamond v. Chakrabarty*, Congress passed the Federal Courts Improvement Act of 1982 and created the Court of Appeals for the Federal Circuit (“CAFC”). This new court, with jurisdiction over appeals from all patent cases in the federal district courts,<sup>76</sup> was seen as

*University Research Systems in Economic Perspective: A View From the Demand Side* (working paper on file with the author); *The Kept University*, ATLANTIC MONTHLY, March 2002, at ; .

<sup>72</sup> *Diamond v. Chakrabarty*, 447 U.S. 303, 313 (1980).

<sup>73</sup> *Id.* (“Congress intended statutory subject matter to include ‘anything under the sun that is made by man.’”) citing S. REP. NO. 1979, 82d Cong., 2d Sess., at 5 (1952), H. R. Rep. No. 1923, 82d Cong., 2d Sess., 6 (1952) U.S. Cod Cong. & Admin. News 1952, pp. 2394, 2399.

<sup>74</sup> *Id.* A much earlier decision, *Parke-Davis & Co. v. H.K. Mulford & Co.*, 196 F. 496 (1926), in combination with *Chakrabarty*, set the stage for the patenting of genes, DNA, and other naturally occurring biological material isolated from, and in a purified state relative to its natural condition. While abstract ideas, natural phenomena, and products of nature are still nominally excluded from patent eligibility, the allowance of patents covering isolated genes and purified DNA narrows the scope of “natural phenomena” that is in the public domain and not eligible for patent protection. For a more in-depth discussion of patent eligibility standards in the U.S., see Margo A. Bagley, *Patent First, Ask Questions Later: Morality and Biotechnology in Patent Law*, 45 WILLIAM & MARY L. REV. 469 (2003).

<sup>75</sup> Joshua A. Newberg & Richard L. Dunn, *Keeping Secrets in the Campus Lab: Law, Values, and Rules of Engagement for Industry-University R&D Partnerships*, 39 AM. BUS. L.J. 187, 196 (2002).

<sup>76</sup> This is a bit of an overstatement. The CAFC has jurisdiction over appeals of cases in which the plaintiff’s complaint contained a claim “arising under” the Patent Act. See *Holmes v. Vornado* (USSC 2002).

necessary to eliminate the rampant forum shopping in patent cases due to the presence of pro-and anti-patent regional circuit courts. This move had the ultimate effect of increasing patenting levels because the CAFC's largely pro-patent decisions increased certainty making virtually all patents more valuable.<sup>77</sup> This in turn boosted university-industry technology transfer since the rights universities could award under the Bayh-Dole Act also became more valuable.

But Congress did not stop there. Additional legislative efforts, culminating most recently in an Act to facilitate the patenting of results of collaborative work, evidence a continued desire to benefit university-industry partnerships through patent policy initiatives.<sup>78</sup>

## ii. Facilitating Collaboration: The CREATE Act of 2004

Congress did not stop with the Bayh-Dole Act in using patent law to facilitate technology transfer and collaborative activities. In 2004, Congress reaffirmed its commitment to such efforts with the passage of the Collaborative Research and Technology Enhancement Act ("the CREATE Act"), a provision narrowly tailored to remove a specific impediment to the patenting of collaborative research results. The Act overturned the CAFC's 1995 *OddzOn v. Just Toys* decision and extended the non-obviousness safe harbor of 35 U.S.C. §103(c) to include prior inventions of researchers from different organizations operating pursuant to a joint research agreement.<sup>79</sup>

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<sup>77</sup> See Federal Trade Commission, *Symposium: Ideas into Action: Implementing Reform of the Patent System: To Promote Innovation: The Proper Balance of Competition and Patent Law and Policy: Executive Summary*, 19 BERKELEY TECH. L.J. 861, 865 (2004) ("The Court of Appeals for the Federal Circuit, the sole court for most patent law appeals, has brought stability and increased predictability to various elements of patent law.").

<sup>78</sup> See 35 U.S.C. §103(c), as amended by the Cooperative Research and Technology Enhancement Act of 2004.

<sup>79</sup> As amended by the CREATE Act, 35 U.S.C. §103(c) now provides

(c) (1) Subject matter developed by another person, which qualifies as prior art only under one or more of subsections (e), (f), and (g) of section 102 of this title [35 USCS § 102], shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the claimed invention was made, owned by the same person or subject to an obligation of assignment to the same person.

(2) For purposes of this subsection, subject matter developed by another person and a claimed invention shall be deemed to have been owned by the same person or subject to an obligation of assignment to the same person if--

(A) the claimed invention was made by or on behalf of parties to a joint research agreement that was in effect on or before the date the claimed invention was made;

(B) the claimed invention was made as a result of activities undertaken within the scope of the joint research agreement; and

(C) the application for patent for the claimed invention discloses or is amended to disclose the names of the parties to the joint research agreement.

(3) For purposes of paragraph (2), the term "joint research agreement" means a written contract, grant, or cooperative agreement entered into by two or more persons or entities for the performance of experimental, developmental, or research work in the field of the claimed invention.

Prior to the passage of the CREATE Act, the joint collaboration of coworkers for the *same* employer could not be used as prior art for obviousness against later work, but that protection did not extend to the collaborations of coworkers from *different* organizations (such as those in university-industry joint research agreements). The CREATE Act eliminated the “same/different” organization distinction by disqualifying from the state of the art for determining obviousness “secret” prior art which is the work of researchers from different research organizations *if* there was a pre-existing agreement for research collaboration.

In his remarks introducing the CREATE Act, Senator Orrin Hatch (R-UT) explicitly related the new legislation to the goals of Bayh-Dole:

This bill makes a narrow but important change in our patent laws to ensure that the American public will benefit from the results of collaborative research efforts that combine the erudition of great public universities with the entrepreneurial savvy of private enterprises. . . . [W]e must encourage—not discourage—public institutions and private entrepreneurs to combine their respective talents in joint research efforts. Indeed Congress committed itself to this principle when it passed the Bayh-Dole Amendments to the Patent Act. The CREATE Act will simply conform the present language of the Patent Act to the intent that has always animated it.<sup>80</sup>

Senator Patrick Leahy (D-VT) also praised the Bayh-Dole Act in introducing the CREATE Act:

When Congress passed the Bayh-Dole Act in 1980, the law encouraged private entities and not-for-profits such as universities to form collaborative partnerships in order to spur innovation. Prior to the enactment of this law, universities were issued fewer than 250 patents each year. That this number has in recent years surpassed two thousand is owed in large measure to the Bayh-Dole Act. The innovation this law encouraged has contributed billions of dollars annually to the United States economy and has produced hundreds of thousands of jobs.”<sup>81</sup>

The CREATE Act was broadly supported by the USPTO, research universities, and the biotech industry, and met with little resistance as it moved through the House and Senate. One Congressman described the CREATE Act as “a rare legislative achievement: it is a truly noncontroversial patent bill.”<sup>82</sup> However, while the CREATE Act itself may be uncontroversial, unintended side effects of Congress’ decision to use

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<sup>80</sup> The Cooperative Research and Technology Enhancement Act of 2004, S. 2192, 108th Cong., Cong. Rec. 3/10/04, S2559 (enacted) (Statement of Senator Orrin Hatch-R-UT).

<sup>81</sup> The Cooperative Research and Technology Enhancement Act of 2004, S. 2192, 108th Cong., Cong. Rec. 3/10/04, S2559 (enacted) (Statement of Senator Patrick Leahy, D-VT).

<sup>82</sup> The Cooperative Research and Technology Enhancement Act of 2004, HR.2391, 108th Cong., Cong. Rec. 3/10/04, H944 (enacted) (Statement of Congressman Berman).

patent policy to facilitate university-industry technology transfer are cause for concern in the academy and beyond.

## B. COSTS TO ACADEME

The decision to use patent law as a tool to promote university-industry technology transfer via the Bayh-Dole Act is certainly justifiable as a matter of policy, and its effectiveness has been borne out over time. Patents provide incentives for the disclosure,<sup>83</sup> development, and commercialization of new discoveries by providing patentees with the right to exclude others from practicing the invention for a term of years, in exchange for adequately disclosing how to make and use the invention to the public.<sup>84</sup> This right to exclude can be very valuable by allowing the inventor to set the price for access to the invention, and it can provide the basis for a legal monopoly. However, patent law brought with it a whole regime of rules and regulations developed without the norms or needs of academic researchers in mind. The result has been a steady deterioration in the quality and quantity of scientific discourse, at least in some disciplines, as well as negative impacts on the focus of academic research and the communal environment in which it takes place.

### i. Discourse: “Mum’s the Word”

“The first impulse for university researchers is to publish and present their results, which it should be.”<sup>85</sup> This impulse has practical and normative origins as the road to tenure, at most institutions of higher education, is paved with publications.<sup>86</sup> “Publish or

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<sup>83</sup> Providing an incentive to disclose an invention is a well established function of patent law. *See, e.g.*, Edmund W. Kitch, *The Nature and Function of the Patent System*, 20 J.L. & ECON. 265, 277-78 (1977); Rebecca S. Eisenberg, *Patents and the Progress of Science: Exclusive Rights and Experimental Use*, 56 U. CHI. L. REV. 1017 (1989) (“secrecy makes it difficult for inventors to sell or license their inventions to others because it is difficult to persuade someone to pay for an idea without disclosing it, yet once the invention is disclosed, the inventor has nothing else to sell. The patent system solves this problem by permitting inventors to disclose their patented inventions to potential users without losing their exclusive rights.”). The patent bargain requires inventors to forgo trade secret protection and effectively makes the invention known to the world through the patent document. Unfortunately, this disclosure generally does not take place until the patent application describing the invention is published, which normally is eighteen months after the filing date. Moreover, this particular incentive is not needed for the university researcher, since open science and discourse norms encourage early disclosure through publications and presentations.

<sup>84</sup> The current term is 20 years from the date of filing the first non-provisional application. See 35 USC 112, 154.

<sup>85</sup> Georgia Tech Research Corporation, *Technology Transfer Buzz* (Fall 2004) <[http://otl.gtrc.gatech.edu/OTL\\_Fall\\_2004.pdf](http://otl.gtrc.gatech.edu/OTL_Fall_2004.pdf)>.

<sup>86</sup> *See, e.g.*, Lisa Whitten & Linda Anderson, *Getting Beyond the Academic Gatekeepers: The Tenure Process*, American Psychological Association, at <http://www.apa.org/apags/profdev/abtttenure.html> (visited Oct. 17, 2005) (“In general, a career as a “tenure-track” faculty member in higher education is made up of four components: teaching, service to the institution, service to the community, and professional/scholarly development, which includes publishing, research and grants”); David B. Rivers, *When Tenure Standards Change*, Inside Higher Education, at <http://www.insidehighered.com/workplace/2005/05/20/rivers> (last modified May 20, 2005).

perish” is the oft heard mantra, and issued patents and start-up companies, lucrative or not, may be considered poor substitutes for scholarly publications by tenure committees.<sup>87</sup> The nurturing of a publication mentality begins even before matriculation, as the authors of a guide to “The Ph.D. Process” offer the following advice to budding graduate students:

[I]n order to increase your chances of future employment in this publish-or-perish business, you have to build and maintain an image of productivity-publishing your work should be a top priority that starts in graduate school and continues throughout your career. A publication tells the world that your work has been judged by outside reviewers and found deserving; your publication record is the official declaration of your “worth” and effectiveness, and *a good/consistent publication record is singularly the most important asset a scientist can have.*<sup>88</sup>

Despite the pervasive indoctrination of publishing norms among academic scientists,<sup>89</sup> more and more researchers in the U.S. are delaying or forgoing acting on this impulse. A recent article in *Fortune* magazine notes that the U.S. contribution to global knowledge, as measured by published articles in top journals around the world, is “stagnating.”<sup>90</sup> While there may be other contributing factors, patents are the likely culprits for this disturbing trend.<sup>91</sup> In the U.S. system, patents are awarded for new and useful “machines, processes, manufactures, and compositions of matter.” But it is not

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<sup>87</sup> See GARY RHODES AND SHEILA SLAUGHTER, *ACADEMIC CAPITALISM AND THE NEW ECONOMY* 114 (2004). According to the authors:

About 60% of the faculty we interviewed held patents. Almost all valued publishing research papers more highly than patenting. A few thought patents had some merit, but they were the exception. As a professor of chemical engineering explained: “A patent is hard to get, okay, but a patent doesn’t need to be a scientific document . . . You can patent things that are just scientifically terrible . . . I think most people in academia . . . I think the thing that is valued the most is a high-quality scientific publication.”

<sup>88</sup> DALE F. BLOOMET . AL., *THE PH.D. PROCESS: A STUDENT'S GUIDE TO GRADUATE SCHOOL IN THE SCIENCES* 74-75 (1998) (emphasis in original).

<sup>89</sup> See generally European Commission, *Grace Period and Invention Law in Europe and Selected States*, IPR Helpdesk, at [http://www.ipr-helpdesk.org/documentos/docsPublicacion/pdf\\_xml/8\\_GracePeriodinventionLaw\[0000004514\\_00\].pdf](http://www.ipr-helpdesk.org/documentos/docsPublicacion/pdf_xml/8_GracePeriodinventionLaw[0000004514_00].pdf) (visited Oct. 10, 2005) (explaining the difficulties for university inventors caused by the lack of a grace period in Europe since publications are “decisive” for an academic researcher’s career and reputation.).

<sup>90</sup> See Clifton Leaf, *The Law of Unintended Consequences*, *Fortune*, at <http://www.fortune.com/fortune/print/0,15935,1101810,00.html> (Sept. 7, 2005) (“While the number of journal articles produced by American researchers has risen slightly since 1988, the rest of the world has raced ahead.”).

<sup>91</sup> See Jeremy M. Grushcow, *Measuring Secrecy: A Cost of the Patent System Revealed*, 33 J. LEGAL STUD. 59, 82 (2004) (“scientists seeking to patent their inventions face a conflict between the incentives created by patent law to keep their data secret until they are substantially finished and the norms of the scientific community, which dictate that data should be shared at an early stage”). Also cite secrecy article that says even non-patent seeking academics are delaying, perhaps as a backlash to increased secrecy by patent-seekers.

enough for an invention to fit in one of these categories, it must also be novel and non-obvious to a person having ordinary skill in the art to which the invention pertains.<sup>92</sup>

Both the novelty and non-obviousness requirements mandate a comparison of the invention with prior art identified by 35 U.S.C. § 102.<sup>93</sup> Prior art is defined as “knowledge that is available, including what would be obvious from it, at a given time, to a person of ordinary skill in an art,” as long as that information is drawn from the sources of information identified in section 102.<sup>94</sup> Under these provisions, patent-defeating prior

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<sup>92</sup> See 35 U.S.C. §§ 101, 102, 103.

35 U.S.C. § 102 contains the novelty requirement and provides that:

A person shall be entitled to a patent unless--

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for patent, or

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of the application for patent in the United States, or

(c) he has abandoned the invention, or

(d) the invention was first patented or caused to be patented, or was the subject of an inventor's certificate, by the applicant or his legal representatives or assigns in a foreign country prior to the date of the application for patent in this country on an application for patent or inventor's certificate filed more than twelve months before the filing of the application in the United States, or

(e) The invention was described in-- (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, . . . or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, . . . ; or

(f) he did not himself invent the subject matter sought to be patented, or

(g)(1) during the course of an interference . . . another inventor involved therein establishes, to the extent permitted in section 104, that before such person's invention thereof the invention was made by such other inventor and not abandoned, suppressed, or concealed, or (2) before such person's invention thereof, the invention was made in this country by another inventor who had not abandoned, suppressed, or concealed it. In determining priority of invention under this subsection, there shall be considered not only the respective dates of conception and reduction to practice of the invention, but also the reasonable diligence of one who was first to conceive and last to reduce to practice, from a time prior to conception by the other.

The non-obviousness requirement is codified at 35 U.S.C. § 103 which provides, in pertinent part:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains . . . . (c) Patentability shall not be negated by the manner in which the invention was made.

<sup>93</sup> The term “prior art” used generically refers to the body of information against which a claimed invention is compared in the determination of whether it is new and non-obvious.

<sup>94</sup> *Kimberly-Clark Corp. v. Johnson & Johnson*, 745 F.2d 1437, 1453 (Fed. Cir. 1984); 35 U.S.C. § 103. Pursuant to paragraph (c) of Section 103, subject matter that qualifies as prior art only under Section 102(e), (f), or (g) cannot preclude the patentability of an invention where that subject matter and the invention, at the time the invention was made, were commonly owned or subject to an obligation of

art can include printed publications from anywhere in the world, public knowledge or use of the invention before the applicant's date of invention, or public use or sale more than one year before the applicant's filing date.<sup>95</sup> Section 102 identifies the knowledge against which patentability is assessed and details the bases upon which an applicant can be denied a patent based on either lack of novelty of the invention or loss of right to the invention.<sup>96</sup> Thus an inventor can lose the right to obtain a potentially lucrative patent on an invention by publicly disclosing her invention, such as through presentation or publication, before filing a patent application.

As between an inventor seeking a patent and the preservation of the public domain, the courts have interpreted the Section 102 prior art rules overwhelmingly in favor of the public domain, consistent with an understanding that

The novelty and non-obviousness requirements express a congressional determination that the purposes behind the [Intellectual Property] Clause are best served by free competition and exploitation of either that which is already available to the public or that which may be readily discerned from publicly available material.<sup>97</sup>

As a result, "printed publications" which are a category of prior art under the statute, have been interpreted to include microfilm, microfiche, internet postings, videotapes, and, most recently, slides affixed to poster boards, as long as they are publicly accessible.<sup>98</sup> That latest expansion of the phrase was enunciated in the Court of Appeals for the Federal Circuit's 2004 *In Re Klopfenstein* decision.<sup>99</sup> For the first time, the court held that university researchers who presented study results at a scientific conference more than two years before filing a patent application covering the advance were barred from patenting the disclosed invention even though no copies of any

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assignment to the same person. It is worth noting that an applicant need not be aware of prior art for the information to be used against her patent application. Knowledge of all of the relevant art is presumed on the part of the hypothetical person of ordinary skill. *See In re Carlson*, 983 F.2d 1032, 1035-37 (Fed. Cir. 1992). "Section 102 has as one objective that only the first inventor obtain a patent . . . Foreign 'patents' and foreign 'printed publications' preclude the grant of a patent whether or not the information is commonly known. Under [section] 102 a conclusive presumption of knowledge of such prior art is, in effect, a statutorily required fiction." *In re Howarth*, 654 F.2d 103, 106 (C.C.P.A. 1981).

<sup>95</sup> *Id.*

<sup>96</sup> 35 U.S.C. § 102. Subsections (a), (e), (f), & (g) are considered novelty provisions while subsections (b), (c), and (d) are loss of right provisions by which an inventor loses the right to a patent because the invention is legally deemed to lack novelty. Subsection (b) is also a prior art provision like the novelty provisions, while subsections (c) and (d) are generally not considered to be prior art provisions. *See Oddzon Prods., Inc. v. Just Toys, Inc.*, 122 F.3d 1396 (Fed. Cir. 1997).

<sup>97</sup> *Bonito Boats, Inc. v. Thundercraft Boats, Inc.*, 489 U.S. 141 (1989).

<sup>98</sup> *See In re Hall*, 781 F.2d 897, 898 (Fed. Cir. 1986) (noting that the phrase printed publication "has been interpreted to give effect to ongoing advances in the technologies of data storage, retrieval, and dissemination.")

<sup>99</sup> *In Re Klopfenstein*, 380 f 1345, 1352 (Fed. Cir. 2004).

enabling document were distributed.<sup>100</sup> The rejection was based on the fact that slides disclosing the later-claimed invention were displayed on posters at the conference for two and a half days without any notice that note-taking was prohibited.<sup>101</sup>

The court's reliance on a totality of the circumstances analysis could have a further chilling effect on conference presentations by university researchers seeking to disseminate early results, since its "totality of the circumstances" analysis fails to provide clear guidelines on which presenters can rely to avoid losing patent rights. This is quite unfortunate considering the importance of conference presentations to knowledge dissemination. As one commentator explains:

Conference presentations of early data are not only consistent with the communalist norms of scientists, they also serve an important economic function by helping scientists avoid wasteful effort both by sending signals to other scientists and by receiving information from other scientists. First, early data sharing may avoid the expenditure of duplicative effort by allowing scientists working on similar projects to identify each other. They then have the opportunity to either diversify their efforts, collaborate . . . or abandon one of the projects. Second, early data sharing can reduce wasted effort by allowing other scientists to shed light on a project that is not duplicative but merely misguided. . . . Therefore, the increased financial reward for inventive activity increases the risk of rent dissipation in the form of wasted expenditures both from duplicative races to invent and from misguided research that continues unchecked.<sup>102</sup>

Unfortunately, the *In re Klopfenstein* decision may discourage this important form of data sharing and waste avoidance.

In most countries, an inventor creates prior art that will prevent her from later obtaining a patent on her invention if she discloses the invention to the public before filing a patent application.<sup>103</sup> In the U.S., inventors have a one-year grace period in which they can disclose the invention to the public and still retain the right to obtain a patent on the invention.<sup>104</sup> The grace period is an important policy tool that recognizes an inventor's need to assess the commercial potential of an invention before making the generally expensive decision to seek patent protection.

However, there are two significant problems with the current grace period. First, the lack of a one-year month grace period in major foreign patent systems virtually

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<sup>100</sup> *Id.*

<sup>101</sup> *Id.*

<sup>102</sup> Jeremy M. Grushcow, *Measuring Secrecy: A Cost of the Patent System Revealed*, 33 J. LEGAL STUD. 59, 68 (2004).

<sup>103</sup> Specifically most European countries and Japan. See discussion *infra* at \_\_\_\_.

<sup>104</sup> 35 U.S.C. 102(b).

eliminates the benefit of the U.S. grace period for inventors whose discoveries will require patent protection abroad to fulfill their commercial potential.<sup>105</sup> Despite the fact that blockbuster successes tend to be limited to the life sciences,<sup>106</sup> TTOs generally take a prophylactic approach to invention disclosures, advising virtually *all* researchers to seek patent protection before making a public disclosure which could eliminate the opportunity to obtain foreign patent rights.<sup>107</sup> This approach is understandable, since it is impossible to know for certain *ex ante* which inventions will be hugely successful. But it is also regrettable, since it unnecessarily delays the disclosure of much information that either does not need patent protection to be commercializable or would not be sufficiently successful to justify the costs of obtaining foreign patent protection. This aspect of the technology transfer problem has been described by Mowery et. al. in relation to patent licensing agreements:

Patent protection is strong and economically significant in biomedical research, and the dominance of licensing revenues by biomedical inventions reflects this fact. But in other areas, such as electronics, a commercial device may require access to dozens or hundreds of patents, and the average value of a patent often is much lower. Patent licenses are typically less important in these fields . . . indeed, in such fields, the insistence by university administrators on extensive agreements covering intellectual property may serve as a source of friction rather than as a lubricant for research collaborations. It is important for university administrators to adjust their intellectual property policies to accommodate these intersectoral differences, rather than conceptualizing all research collaborations as resembling those common in biomedical research.<sup>108</sup>

Likewise, patent protection, foreign or otherwise, may not be necessary for the commercialization of inventions in all areas of technology. In response to the question “How often are the technologies that you license protected by a patent at the time you negotiate the license agreement?,” only 12% of responding licensees said “almost

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<sup>105</sup> See discussion *infra* at \_\_\_\_.

<sup>106</sup> See generally MOWERY, NELSON, SAMPAT & ZIEDONIS, *IVORY TOWER AND INDUSTRIAL INNOVATION: UNIVERSITY-INDUSTRY TECHNOLOGY BEFORE AND AFTER THE BAYH-DOLE ACT* 56 (2004).

<sup>107</sup> Such a disclosure requirement may be mandated by the university’s intellectual property policy. See for example, *Emory University Intellectual Property Policy*, Office of Technology Transfer, at [http://www.ott.emory.edu/share/policies/intellectual\\_property.pdf](http://www.ott.emory.edu/share/policies/intellectual_property.pdf) (adopted Jun. 6, 2002) (“Emory Personnel will promptly disclose the existence of any Intellectual Property (that is, Intellectual Property to which Emory may assert ownership rights pursuant to Section 1) to OTT.”) and *Georgia Institute of Technology Intellectual Property Policy*, at [http://otl.gtrc.gatech.edu/ip\\_policy.pdf](http://otl.gtrc.gatech.edu/ip_policy.pdf) (visited Oct. 17, 2005) (“To assure protection and potential commercialization, Georgia Tech faculty, staff, and students are encouraged to disclose intellectual property to GTRC in a timely manner prior to any disclosure outside of Georgia Institute of Technology.”).

<sup>108</sup> *Id.* at 190-191.

always,” 13% said “often,” 48% said “sometimes,” and 28% said “rarely.”<sup>109</sup> Yet with TTOs focused on revenue generation and unable to make clear commercialization determinations with limited information on embryonic inventions,<sup>110</sup> researchers are routinely encouraged not to present or publish research results or, at a minimum, to hold off on doing so until a provisional patent application can be filed by the TTO.<sup>111</sup> This builds an inevitable delay into the otherwise early disclosure of research results in written or oral form. Moreover, researchers who intentionally, or inadvertently, make disclosures of their research before filing a patent application may then be discouraged from seeking, or be unable to obtain, even U.S. patent protection for their inventions.<sup>112</sup> While this may seem a positive result for opponents of rampant university patenting, if the justifications for Bayh-Dole were correct, this is not necessarily a good result.

Second, even a one year grace period often is not long enough to accommodate the needs of many researchers due to the realities of academic research and TTO practices. It is not uncommon for more than a single year to transpire before academic research progresses to the point where its commercial potential can be effectively assessed. As noted earlier, university inventions tend to be at a very early stage when they are first disclosed to TTO personnel who generally have limited resources and data for making decisions about which inventions to attempt to patent.<sup>113</sup> This situation is complicated by the propensity of TTOs to use provisional patent applications to save money while securing a priority filing date for university-generated inventions.

For example, in its “Technology Transfer Flow Diagram,” the University of Virginia Patent Foundation notes “[i]nventions and patent applications go hand-in-hand. If patentable subject matter is identified during initial review, and there is sufficient market potential, a Patent Foundation attorney will file a Provisional Patent Application as an initial step to protect the invention.”<sup>114</sup> Unfortunately, the USPTO does not break

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<sup>109</sup> Jerry G. Thursby, Richard Jensen, and Marie C. Thursby, *Objectives, Characteristics and Outcomes of University Licensing: A Survey of Major Universities*, 26 J. TECH. TRANSFER 59, 62 (2001).

<sup>110</sup> *Id.* The study authors also note that over 80% of licensed university technologies are only proof of concept or lab scale prototype.

<sup>111</sup> See, e.g., Lauren Maclanahan, *Technology Transfer Buzz: Things to Know About Information Disclosures*, at 6 (Fall 2004), <[http://otl.gtrc.gatech.edu/OTL\\_Fall\\_2004.pdf](http://otl.gtrc.gatech.edu/OTL_Fall_2004.pdf)>; Laura Heisler, *Be Aware: Public Disclosure Can Affect Patentability*, Wisconsin Alumni Research Foundation, at <http://www.warf.org/news/newsletters-article.jsp?articleid=175> (Feb. 7, 2005), University of Virginia Patent Foundation, *Technology Transfer Flow Diagram*, available at [www.uvafp.org](http://www.uvafp.org) (last visited Oct. 2, 2005).

<sup>112</sup> This could occur if, for example, a TTO refused to assume the cost of patent protection because of the disclosure and the university researcher was unable to afford the patent procurement costs.

<sup>113</sup> See Jerry G. Thursby, Richard Jensen, and Marie C. Thursby, *Objectives, Characteristics and Outcomes of University Licensing: A Survey of Major Universities*, 26 J. TECH. TRANSFER 59, 63 (2001) (“Products and processes based on early stage technologies are often years away from commercialization . . . it is difficult to specify royalty income based on sales . . . for very early stage technologies since the nature of the final product is often unknown”).

<sup>114</sup> *Our Technology Flow Diagram*, University of Virginia Patent Foundation, at <http://www.uvafp.org/> (visited Oct. 17, 2005). See also *Does Commercialization Conflict with Intellectual Freedom or the Academic Mission?*, University of Colorado, at

out the number of provisional applications filed by entity in its statistical reports, nor do most universities break out provisional application filings on their websites. However, for the five universities (the University of Delaware, Emory University, the Georgia Institute of Technology, the Penn State Research Foundation, and the University of Virginia Patent Foundation) for which such information could be gathered from publicly available sources, the numbers are quite compelling: of the total patent applications filed in FY 2004, 72%, 56%, 77%, 63% and 72%, respectively, were provisional applications. Conversely, the USPTO reports that provisional application filings only accounted for 27% of total utility application filings across all applicants.<sup>115</sup> This suggests that universities may indeed rely much more heavily on provisional applications than other types of patent applicants.

Introduced into U.S. law in 1995, provisional applications offer applicants a lower filing fee and an additional 12 months beyond the grace period in which to determine whether to file a regular non-provisional application for a patent.<sup>116</sup> Provisional applications also protect an applicant's right to file in other countries as long as the provisional is filed before the invention is disclosed to the public.<sup>117</sup> However, a provisional application is still a patent application, which should be well drafted if it is to provide any real long-term benefit.<sup>118</sup> This is because claims in any later-filed non-

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<http://www.cu.edu/techtransfer/downloads/bulletins/Bulletin-Commercial%20Technology%20Licensing%20and%20Intellectual%20Freedom.pdf> (visited Oct. 17, 2005) (“The first step in obtaining patent protection is drafting and filing a provisional patent application. This document, which is prepared by outside legal counsel, can range in thoroughness from a complete patent application, to a cover sheet on a manuscript (which is done in emergency situations)”).

<sup>115</sup> *Performance and Accountability Report Fiscal Year 2004*, United States Patent and Trademark Office, at [http://www.uspto.gov/web/offices/com/annual/2004/060401\\_table1.html](http://www.uspto.gov/web/offices/com/annual/2004/060401_table1.html) (visited Jun. 22, 2005).

<sup>116</sup> See 35 U.S.C. §§119(e), 111(b).

<sup>117</sup> Paris Convention, section 119(e).

<sup>118</sup> See, e.g., Arnold B. Silverman, *Proceed With Caution With U.S. Provisional Patent Applications*, JOM, at <http://www.tms.org/pubs/journals/JOM/matters/matters-0002.html> (visited Oct. 17, 2005) Mr. Silverman notes:

One problem that occurs frequently is that the provisional application, which was filed with a somewhat sketchy disclosure and no claims, is the subject of a later-filed complete application based upon the provisional. With the benefit of additional technical information generated in the intervening period between the two filings or the need for the first time to claim the invention, serious issues as to whether the provisional had adequate disclosure to satisfy the statute's disclosure requirement regarding broadening or to support the breadth of the claim can arise. This results in uncertainty as to whether the effective date of the added increment of disclosure or claiming is the date when the provisional application was filed or when the actual complete application was filed. One way to avoid this dilemma or minimize the risk is to file a provisional that has a complete specification and claims directed toward all aspects of the invention known at the time the provisional was filed. This approach, *while increasing the cost of the provisional filing*, minimizes the risk that important aspects of the technology will be of uncertain value, depending upon the filing date of the provisional, the filing date of a later-filed complete application, and any intervening prior art or conduct that could generate a forfeiture of patent rights. It also preserves all of the other benefits of the provisional application.

provisional application which require the prior art protection of an earlier-filed provisional application, must be adequately supported by the disclosure in the earlier application. Also, the provisional application is not examined by the USPTO, and will simply lapse after 12 months and have no further effect unless a regular non-provisional application is filed before that time.

In a further complication for university inventors, the wisdom of heavy reliance on provisional applications has recently come into question as a result of the CAFC's *Phillips v. AWH* decision.<sup>119</sup> In *Phillips*, a closely watched and highly-anticipated case, the court articulated the components of the claim construction inquiry that is often determinative of validity and infringement issues in patent litigation. The court accorded the patent specification a high level of importance in the analysis noting that "the specification 'is always highly relevant to the claim construction analysis. Usually, it is dispositive; it is the *single best guide* to the meaning of a disputed term.'"<sup>120</sup> This focus on the specification suggests inventors and practitioners would do well to place more emphasis on drafting a good disclosure that includes claims, a practice that is not the norm for most TTOs with numerous early stage invention disclosures and a limited prosecution budget.<sup>121</sup>

If TTOs follow the counsel from *Phillips* and put a greater investment into preparing and filing first applications (provisional or non-provisional), they will probably file fewer applications,<sup>122</sup> resulting in fewer inventions with commercial potential being covered by patents. This could be a blessing in disguise as it potentially would put more information into the public domain. Conversely though, university generated inventions tend to be disclosed at a much earlier stage of development and require significant inventor assistance for commercialization.<sup>123</sup> Inventors unable to secure patent protection may discontinue the exploration of those relevant lines of research, a result which flies in the face of the policies underlying Bayh-Dole and which thus could be detrimental to society over the longer term. However, because so many university generated inventions

*Id.* (emphasis supplied)

<sup>119</sup> *Phillips v. AWH*, 415 F.3d 1303 (Fed. Cir. 2005).

<sup>120</sup> *Id.* at 1315.

<sup>121</sup> See Dennis Crouch, *Including Claims in Provisional Patent Applications?*, Patently-O: Patent Law Blog, at [http://patentlaw.typepad.com/patent/claim\\_drafting\\_tips/index.html](http://patentlaw.typepad.com/patent/claim_drafting_tips/index.html) (last modified Sep. 16, 2005). and associated posts for varied views on the necessity of including actual claims in a provisional application after *Phillips*. Even if no claims are included in the application, the following advice from Dennis Crouch, patent attorney and "Patently-O" blogger, seems apt:

In the wake of *Phillips v. AWH*, it has become even more important to ensure that a patent's specification accurately describes the meaning of the associated claim terms. This task is all but impossible in the absence of any claim terms to describe. Thus, it is important to draft at least a few model claims with the provisional application.

*Id.*

<sup>122</sup> Assuming no change in resource level.

<sup>123</sup> Jerry G. Thursby, Richard Jensen, and Marie C. Thursby, *Objectives, Characteristics and Outcomes of University Licensing: A Survey of Major Universities*, 26 J. TECH. TRANSFER 59, 68 (2001).

are embryonic in nature and their commercial potential so uncertain, TTOs may continue to rely on provisional applications, choosing to let questions of the value of any resulting patent be evaluated by potential investors. This could lead to more uncertainty and lower values being assigned to university patents relying on the benefit of provisional application filing dates.

Consequently, considering what potentially is at stake in university patenting, the negative impact of patent law prior art rules on academic discourse and disclosure is not surprising. This situation can create unique problems for university researchers, as illustrated in the following scenario:<sup>124</sup>

*Peter, a 23 year old PhD student in Chemistry at Big X University, discovers some interesting properties of a class of compounds he is experimenting with and decides to publish an article disclosing some of his early findings. Based on counsel from the Big X University Technology Transfer Office (“TTO”), Peter waits until a provisional patent application covering his results is on file with the USPTO before publishing his article. Peter’s research continues to proceed but not as quickly as he had hoped, and, 12 months after the filing of the provisional application, he still has several technical hurdles to clear, and commercial applications of his work are still years away.*

*Forced to make a prediction of the commercial potential of Peter’s work, the TTO chooses not to file a non-provisional application at the end of 12 months and the provisional application becomes abandoned. Peter makes more progress over the next several months but is then counseled by his advisor to significantly change the direction of his research. This is because the publication of the article covering his early findings is now prior art to any future patent application he might file on his new, related discoveries, which probably would not be considered to be different enough from the earlier public disclosure to overcome an obviousness rejection. Despite Peter’s great interest in the area, he follows the instruction and changes his research focus.*

Peter’s predicament is troubling for a variety of reasons. First, Peter’s delay in publishing his results until after the filing of a provisional application is part of a growing trend of secrecy among university researchers in scientific disciplines (life sciences in particular) that runs counter to traditional academic and scientific community norms of open discourse and knowledge sharing. By delaying publication of his research until after the filing of the provisional patent application, Peter potentially has retarded the expansion of knowledge in his area by limiting the pool of information available for others to build upon.

Second, by failing to file a non-provisional application before the provisional application lapsed, the Big X University TTO inadvertently may have led Peter to believe he had protection that he really did not have and he may be 1) more secretive in the future regarding his research results or 2) more hesitant to participate in the patent process.<sup>125</sup>

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<sup>124</sup> Based on an actual event. Names and identifying features have been changed.

<sup>125</sup> See Jason Owen-Smith and Walter W. Powell, *To Patent or Not: Faculty Decisions and Institutional Success at Technology Transfer*, 26 J TECH. TRANSFER 99, 110 (2001) (“The failure to pursue

These are both detrimental effects but for different reasons. Greater secrecy on the part of university researchers further stifles discourse and keeps more information from being built upon, longer. Hesitation by university researchers to participate in the patent process, while not facially a negative result, is harmful if patents are important to the commercialization of university-generated research, which quite a bit of data suggest they are.

Perhaps most troubling of all is Peter's advisor's attitude, reflected in his strong suggestion that Peter change the direction of his research to one in which patent rights might still be obtainable. While this experience is anecdotal and may not be a widespread phenomena in academia, that it happens at all is concerning and evidences a misguided lust for patents over progress that is the antithesis of both academic inquiry and the fundamental goals of the patent system.<sup>126</sup>

## ii. Focus and Community

*I think that faculty members deciding not to patent here would be rare indeed . . . Even if you were so inclined, it would be hard not to notice how fabulously successful some of your peers are. You know from the kind of cars they park in the parking lot and your children might be interacting with their children and say, hey dad, why does Joe have all of this while we're living in a thatched roof hut? It would just be astonishing not to notice.*<sup>127</sup>

The above quote from a faculty member at a large private researcher university highlights two further casualties of the patent/technology transfer boom: community and focus. Bayh-Dole's requirement that universities must share profits from subject inventions with inventors has created millionaires among the faculty ranks at some institutions.<sup>128</sup> While a strong patenting culture can be beneficial in terms of attracting like-minded new faculty and socializing academy members to engage in that pursuit,<sup>129</sup> it can also be detrimental, leading in some cases to rancor, turf disputes, loss of collegiality, and more within and between academic departments.<sup>130</sup>

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smaller scale 'bread and butter' disclosures limits future chances for commercial success by encouraging faculty to bypass the TTO or avoid commercial activities altogether.").

<sup>126</sup> See also GARY RHODES AND SHEILA SLAUGHTER, *ACADEMIC CAPITALISM AND THE NEW ECONOMY* 109-112 (2004) (citing cases of faculty conflicts with PhD students relating to patents).

<sup>127</sup> Jason Owen-Smith and Walter W. Powell, *To Patent or Not: Faculty Decisions and Institutional Success at Technology Transfer*, 26 *J. TECH. TRANSFER* 99, 112 (2001) (quoting a life scientist at an elite private university).

<sup>128</sup> See 35 U.S.C. §202(b)(7). See also Clifton Leaf, *The Law of Unintended Consequences*, *Fortune*, at <http://www.fortune.com/fortune/print/0,15935,1101810,00.html> (Sept. 7, 2005) (discussing millions reaped by Emory University professors in sale of patent royalty rights).

<sup>129</sup> See *id.* at 111.

<sup>130</sup> Loss of community is not just a result of university patenting, but is also attributable to other aspects of the increase in academic capitalism across the U.S. As one commentator notes: “

A loss of community and focus are also a consequence of increased secrecy among scientists. 63% of geneticists surveyed reported that data withholding harmed the quality of their relationships with peers, 45% said it affected their satisfaction with their careers, and 28% reported ending a research collaboration because of it.<sup>131</sup> Of course, patents are not the sole cause of the loss of focus and community observable at some institutions of higher learning; certainly the Bayh-Dole Act's requirement that universities share profits on patented inventions with inventors, and industry sponsorship agreements mandating secrecy in exchange for funding and consulting opportunities are also to blame. Furthermore, the lack of institutional will to, for example, create policies governing disclosure requirements in industry agreements only exacerbates the problem.

Whether benefits associated with patenting or sponsored research funds are causing many researchers to shift from a focus on basic to applied research is unclear.<sup>132</sup> Nevertheless, what is clear is that the incentives of the patent system are affecting the publication norms and practices of many academics. A recent analysis of the presentation, publication, and patenting patterns of university scientists in 1980 and 1990 revealed a troubling trend: an increase in scientist withholding presentation of their data in order to seek patents.<sup>133</sup>

The analysis considered the difference in the "publication gap," the delay between a scientist's presentation of data at a scientific conference and formal publication of that data in a peer-reviewed journal, as well as the increase in meeting abstracts associated with patents. Whereas in 1980, 4.5% of meeting abstracts examined were associated with a patent, by 1990, the corresponding number was 19.2%.<sup>134</sup> Moreover, 88% of patents associated with meeting abstracts had filing priority dates before the conference

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Capitalism, academic style, was once most evident in the realm of patenting and technology transfer . . . but now it extends to instruction . . . Academic capitalism is a cultural system within higher education; it is an internal, not just external threat. It shapes the way we talk about and define our role in the academy. University presidents increasingly see themselves as CEOs and ask to be paid accordingly. More faculty view themselves as small businesspeople . . . Capitalist consciousness reveals itself in the tendency of universities to conflate productivity with generation of external monies, and in that of faculty who get grants to talk of how they "subsidize" other fields.

Gary Rhoades, *Capitalism, Academic Style, and Shared Governance*, Academe, at <http://www.aaup.org/publications/Academe/2005/05mj/05mjrhoa.htm> (visited July 1, 2005).

While the overall loss of community is important, non-patent-driven losses in the areas of focus and community are beyond the scope of this Article.

<sup>131</sup> Eric G. Campbell, et. al., *Data Withholding in Academic Genetics*, 287, No. 4, J. OF THE AM. MED. ASS'N 473, 478 (January 23/30, 2002).

<sup>132</sup> See Jerry G. Thursby and Marie C. Thursby, *Who Is Selling the Ivory Tower? Sources of Growth in University Licensing*, 00 MGMT. SCI. 1, 3 (2001) (noting that "[m]uch of the concern of those who question [Bayh Dole's] impact comes from fears that financial returns to licensing would divert faculty from basic to applied research. . . . we cannot reject the notion that faculty research has shifted.")

<sup>133</sup> Jeremy M. Grushcow, *Measuring Secrecy: A Cost of the Patent System Revealed*, 33 J. LEGAL STUD. 59 (2004).

<sup>134</sup> *Id.* at 73.

presentation, indicating that the researchers delayed presenting data until after a patent application had been filed. The author of the study observed that

Consistent with the incentive to withhold data when seeking patents, the lag between abstract presentation at the meeting and the formal publication in a peer-reviewed journal was shorter for university and NIH scientists<sup>135</sup> who sought patents than for their peers who did not seek patents. University scientists who sought patents presented meeting abstracts only on work that was complete, on average publishing in the same year as the meeting abstract, whereas university scientists who were not seeking patents published on average 1.21 years after their data were presented as a meeting abstract.<sup>136</sup>

The author concluded from the data that “scientists who seek patents are more secretive, withholding publication or presentation of their data so as not to jeopardize patentability.”<sup>137</sup>

A variety of solutions have been proposed to deal with varying aspects of the technology transfer problem, including heightening the utility requirement, so that fewer upstream inventions (e.g., research tools) are eligible for patent protection, codifying an experimental use exemption into patent law, and giving funding agencies more latitude in deciding whether to take title to certain fundamental inventions away from universities.<sup>138</sup> These are laudable and promising initiatives, but without a more fundamental change in the strictures of patent law, they are unlikely to affect the publication delay and norm deterioration spreading throughout academia today. Perhaps a different approach, targeted to the specific problems that contribute to the perceived need for increased secrecy in the academy can stem the rising tide of secrecy and enable, at least in part, the revival of communal sharing norms and discourse.

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<sup>135</sup> The Stevenson-Wydler Act applied the Bayh-Dole Act provisions to researchers in government labs, such as the NIH. Consequently, such researchers also have increased incentives to patent and commercialize their work.

<sup>136</sup> Jeremy M. Grushcow, *Measuring Secrecy: A Cost of the Patent System Revealed*, 33 J. LEGAL STUD. 59, 74 (2004). However, 90% of meeting abstracts were followed up with a formal publication. This indicates that even though university researchers may withhold early data, they still seek the kudos ultimately associated with publication.

<sup>137</sup> *Id.* at 82. The author also noted that over time, secrecy increased among non-patent-seeking university researchers as well, suggesting an overall deterioration in academic sharing norms after Bayh-Dole.

<sup>138</sup> See, e.g., Katherine J. Strandburg, *What Does the Public Get? Experimental Use and the Patent Bargain*, 2004 WIS. L. REV. 81 (2004); Janice M. Mueller, *The Evanescent Experimental Use Exemption From United States Patent Infringement Liability: Implications for University and Nonprofit Research and Development*, 56 BAYLOR. L. REV. 917 (2004); and Arti K. Rai & Rebecca S. Eisenberg, *Bayh-Dole Reform and the Progress of Biomedicine*, 66 L. & CONTEMP. PROBS. 289, 291 (2003).

### III. CAN WE TALK?: PROPOSALS FOR IMPROVING ACADEMIC DISCOURSE

*[T]he patent system will influence the behavior of research scientists more effectively if it takes into account the norms and incentives that guide behavior in the scientific community.*<sup>139</sup>

The one-year grace period is an aid to university researchers as it enables them to engage in scholarly discourse through presentations and publications while still retaining the right to obtain a U.S. patent. I propose that the strictures of patent law which have contributed to the increasing strain on scholarly discourse be relaxed to allow university researchers more time in which to disclose aspects of their embryonic research while still retaining the right to obtain a patent on better defined, down-stream inventions.<sup>140</sup> More particularly, I propose amending the U.S. Patent Act to create an opt-in system whereby academic researchers could choose to have two years from the time they first disclose the invention to the public to file an application in the USPTO. This would extend the amount of time available to inventors and TTOs to determine whether to file a patent application.

In exchange for the front-end extension of grace, researchers availing themselves of the provision would agree to give up the normal eighteen month patent application pre-publication period;<sup>141</sup> in essence agreeing to the publication of their applications, provisional or non-provisional, immediately after the filing date. Such an amendment should improve scholarly discourse and benefit the public good by lowering the risk to researchers of complying with academic norms of early disclosure of results. It should also be a boon to technology transfer by enabling TTOs to better allocate patent-obtaining resources to inventions with the most commercial potential.

Such a provision might be even more palatable to third parties if accompanied by an experimental use exemption, allowing for experimentation on and perhaps with the disclosed invention without fear of infringement liability.<sup>142</sup> Such an exemption could be useful because under the extended grace period, even with immediate publication, third parties may have longer to wait before they know whether the inventor will seek patent protection and for what aspects of the disclosed information.

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<sup>139</sup> Rebecca S. Eisenberg, *Proprietary Rights and the Norms of Science in Biotechnology Research*, 97 YALE L.J. 177, 231 (1987) [hereinafter Eisenberg, *Proprietary Rights and the Norms of Science*].

<sup>140</sup> As well as other small entities as defined in 37 C.F.R. 1.9.

<sup>141</sup> See 35 U.S.C. §122.

<sup>142</sup> See, e.g., Janice M. Mueller, *The Evanescent Experimental Use Exemption From United States Patent Infringement Liability: Implications for University and Nonprofit Research and Development*, 56 BAYLOR L. REV. 917 (2004); Katherine J. Strandburg, *What Does the Public Get? Experimental Use and the Patent Bargain*, 2004 WIS. L. REV. 81 (2004); and *Merck v. Integra*, Brief for Amicus Curiae Bar Association of the District of Columbia – Patent, Trademark, & Copyright Section, 2005 WL 435891.

In addition, to have any impact on the deterioration of disclosure norms in the life sciences, the United States must use its considerable influence, with at a minimum its trilateral harmonization partners, Europe and Japan, to encourage the adoption of a one year prior art grace period abroad. This would allow university inventors seeking to secure U.S. and foreign patent protection to engage in academic discourse during the extant one year grace period that they currently must forgo.

#### A. EXTENDING GRACE AND PROMPT PUBLICATION

As noted above, the period of time an invention can be exposed to the public without impacting its novelty for patentability purposes is generally known as a grace period. Inventors must file patent applications in the USPTO within one year of disclosing the invention to the public or forfeit the right to obtain a patent on that invention. While disclosures of embryonic research may not be “enabling” as required for rejections under 102(b), even a non-enabling reference can be used in a rejection for obviousness under Section 103 of the Patent Act. Moreover, the enablement requirement applies to patent *claims*.<sup>143</sup> Generally, a researcher will not know the scope of final patent claims at the time a public disclosure is made even if a provisional application is filed prior to the disclosure, since (1) provisional applications are not required to contain claims and (2) claims invariably are amended during the prosecution of the later-filed non-provisional patent application. Thus, the status of the disclosure, as enabling or not, cannot be known with certainty at the time the disclosure is being made.

Under my proposal, the current one-year prior art grace period/eighteen month publication system would remain intact. However, the patent act would be amended to create an optional two-year grace period for university researchers needing the additional prior art protection because of public disclosures made through presentation or publication activities. In exchange for the front-end extension of grace, researchers choosing to avail themselves of the provision would agree to immediate publication of their patent application upon filing instead of relying on the 18-month blanket of secrecy provided to other applications.<sup>144</sup> This two-part system would have the effect of enabling academic researchers to engage in the discourse so necessary to norms of open science while still giving third parties an early indication, through immediate publication, of whether patent protection would be sought for information disclosed in public forums.

Pending legislation in the form of HR 2795 the Patent Reform Act of 2005, contains a very different prior art provision than the current U.S. standard, but it does retain the one-year grace period.<sup>145</sup> Various modifications to the language of the bill have been proposed, including one called the “Coalition Draft” from the Coalition for 21<sup>st</sup>

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<sup>143</sup> 35 U.S.C. §112.

<sup>144</sup> See 35 U.S.C. §122. Immediate publication should not be a burden to academic researchers since the only inventors taking advantage of the extended grace period would be ones that had previously disclosed the invention to the public.

<sup>145</sup> See Patent Act of 2005, H.R. 2795, 109th Cong. (2005).

Century Patent Law Reform, a group of major U.S. corporations.<sup>146</sup> The prior art provision of this draft would amend Section 102 of the Patent Act to provide, in pertinent part:

102(a): A patent for a claimed invention may not be obtained if  
(1) the claimed invention was patented, described in a printed publication, or otherwise publicly known -  
(A) more than one year before the effective filing date of the claimed invention; or  
(B) before the effective filing date of the claimed invention, other than through disclosures made by the inventor or a joint inventor or by others who obtained the subject matter disclosed directly or indirectly from the inventor or a joint inventor . . .<sup>147</sup>

To implement the opt-in extended grace period for academic researchers, the provision could be amended to add, for example:

*102(b): A patent for a claimed invention may not be obtained by an inventor associated with a university or other institution of higher education, if  
(1) the claimed invention was patented, described in a printed publication, or otherwise publicly known -  
(A) more than two years before the effective filing date of the claimed invention; or  
(B) before the effective filing date of the claimed invention, other than through disclosures made by the inventor or a joint inventor or by others who obtained the subject matter disclosed directly or indirectly from the inventor or a joint inventor . . .*

To take advantage of the provision, applicants would need to make a notation to that effect in their application at filing. In addition, 35 U.S.C. §122(b) which authorizes the publication of pending patent applications eighteen months after their earliest filing date would also be amended to include a new provision, such as:

*122(b)(2)(C): Each application for a patent claiming the benefit of the two-year grace period provided in 35 U.S.C. §102(b) shall be published promptly after the filing date of such application.*

Such a narrowly tailored opt-in provision, tying the extended grace period to early publication, would, like the CREATE Act, maintain Bayh-Dole incentives for university technology transfer while simultaneously allowing academic researchers greater freedom to engage in early and full discourse. The provision would also protect such inventors

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<sup>146</sup> See Coalition for 21st Century Patent Law Reform, *Coalition Draft Mark-up of Amendment in the Nature of a Substitute to H.R. 2795 Offered by Mr. Smith of Texas*, at [http://www.fr.com/news/2005-09-14\\_Coalition\\_Draft.pdf](http://www.fr.com/news/2005-09-14_Coalition_Draft.pdf) (last modified Sept. 1, 2005).

<sup>147</sup> *Id.*

against third party actions in trying to patent discoveries already disclosed by the inventor.

This proposal recognizes the reality that many universities are experiencing an inexorable push to establish TTOs and secure patents despite the fact that for many universities, technology transfer is a losing proposition.<sup>148</sup> More universities, faced with dwindling budgets and dazzled by the lure of blockbuster success stories, are establishing TTOs to generate revenue from patentable inventions. According to the Association of University Technology Managers, nearly all research universities have established TTOs and the membership of AUTM keeps growing. The 2003 AUTM survey reports:

[O]ne of the themes that emerges — and is reflected in the increase of AUTM’s membership from 1,015 in 1993 when the first survey was published to 3,155 now — is how the mission of technology transfer is permeating all parts of academia. Even the smallest colleges and universities are creating the infrastructure to translate the fruits of their research into products that serve the public good.<sup>149</sup>

If more and more universities ramp up TTO activities, we can expect, over time, to see more delays in disclosures of scientific results across all technology areas as more university inventors become subsumed in the patenting culture and fell compelled to comply with its novelty rules.

Should university inventors be able to have their cake (disclose inventive concepts through discourse) and eat it too (still obtain patents on their disclosed inventions)? Congress thinks so; otherwise we would not have the current grace period. Consequently, the question is not one of whether inventors should be able to do this, but for how long.

When the grace period was first introduced in the Patent Act of 1839, it provided an inventor two years from the first public use or sale of an invention to file a patent application claiming the invention.<sup>150</sup> The provision provided new, broader rights for inventors since under the previous Act, any public use or sale of the later-patented invention that took place with the inventor’s consent before the filing of a patent application would void the later patent.<sup>151</sup> However, the provision also narrowed inventor rights since under the prior Act, even if an invention had been in public use or on sale for a long time before the inventor filed her patent application, if the uses or sales

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<sup>148</sup> *AUTM Licensing Survey: FY 2003 Survey Summary*, Association of University Technology Managers, <http://www.autm.net/surveys/dsp.surveyDetail.cfm?pid=16> (visited Oct. 9, 2005).

<sup>149</sup> *Id.*

<sup>150</sup> Patent Act of 1839.

<sup>151</sup> *See, e.g., Andrews v. Hovey*, 123 U.S. 267, 273 (1887) (Calling the 1839 Act “an amelioration in favor of the inventor, in this respect, of the strict provisions of the act of 1836”).

had taken place without the inventor's consent, they would not bar her right to obtain a patent.<sup>152</sup>

The Patent Act of 1939, enacted during a period of strong anti-patent, anti-monopoly sentiment, reduced the grace period from two years to one year.<sup>153</sup> As explained in the Senate Report accompanying the Act:

In 1839, when the period of two years was first adopted, it may have been a proper length of time for an inventor to make up his mind whether or not to file a patent application for patent. Under present conditions, 2 years appears unduly long and operates as a handicap to industry. Reduction of the period would serve to bring the date of patenting closer to the time when the invention is made, . . . One year is believed to be a very fair period for all concerned.<sup>154</sup>

It seems unlikely that the “all” with whom the Senate was “concerned” included serious contemplation of university inventors, considering the relatively miniscule levels of university patenting taking place at the time. The only university TTO during that period was WARF and it had only been formed in 1925.<sup>155</sup> Moreover, Congress likely wanted to “bring the date of patenting closer to the time when the invention [was] made” because at that time, patent applications were maintained in secrecy by the USPTO until the patent issued, which could be many years after the application was filed. There was no eighteen month publication provision to let third parties know that an inventor was seeking to patent an invention that appeared to be in the public domain. The immediate publication aspect of the proposed opt-in provision alleviates that concern.

Alternatively, the opt-in system could provide a shorter, eighteen month grace period. While a full two-year grace period would be preferable for academic inventors, eighteen months could be a reasonable compromise considering third party needs for certainty regarding the proprietary status of publicly disclosed information. Also, a study by Grushcow comparing changes in early data sharing by university scientists between 1980 and 1990 seem to indicate support for an eighteen month window:

When Bayh-Dole was implemented in 1980, university scientist presented data that were on average 1.37 years from publication. By

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<sup>152</sup> *Id.* at 274 (noting that “[t]he right of an inventor to obtain a patent was in this respect narrowed, and the rights of the public as against him were enlarged, by the act of 1839.”)

<sup>153</sup> *See, e.g.,* Adelman, Rader, et. al., *Cases and Materials on Patent Law*, p. 13 (West Publishing 2003) (“The Depression era, with all its sentiments against monopoly, brought with it a vigorous distrust of patents.”)

<sup>154</sup> *Id.*

<sup>155</sup> MOWERY, NELSON, SAMPAT & ZIEDONIS, *IVORY TOWER AND INDUSTRIAL INNOVATION: UNIVERSITY-INDUSTRY TECHNOLOGY BEFORE AND AFTER THE BAYH-DOLE ACT* 9-34 (2004).

1990, they presented significantly fewer early data, with abstracts being on average only 0.83 years from publication.<sup>156</sup>

The 1980 average of 1.37 years is close to the 1.5 years an eighteen month grace period would provide. Moreover, by allowing for immediate publication of applications, the eighteen month option would have a minimal effect on certainty for third parties interested in the proprietary status of such research since information regarding filed patent applications would be publicly available sooner.<sup>157</sup>

This proposal will not be applicable to every invention a university generates. To the extent the commercial potential of an invention is readily apparent, a TTO will likely take steps to obtain patent protection swiftly, without needing the benefit of an extended grace period. Also, inventors of pharmaceutical compounds and other discoveries for which foreign patent protection is important, likely will not take advantage of the extended grace period.<sup>158</sup> Nevertheless, as one economist notes “it does not take a high frequency of a problem to impose significant social costs if the problem emerges for a technology of sufficient importance.”<sup>159</sup> This provision will be most useful for those embryonic ideas that are just well-defined enough to be dangerous in a patent prior art sense, but not well defined enough to be clearly commercializable, the kind of information that traditionally would be freely shared by researchers before passage of the Bayh-Dole Act.

Extending the printed publication grace period would also provide a not insignificant benefit to TTOs in their efforts to efficiently manage limited financial resources. There is a real dollar cost to each patent application a TTO files.<sup>160</sup> Moreover, while a TTO may be able to file numerous provisional applications, if a regular non-provisional application is not filed within 12 months from the filing date of the provisional, the provisional lapses and is essentially wasted.<sup>161</sup>

It is understandable that TTO personnel are pro-patent and seek to educate researchers about the dangers of disclosure to potential patent rights. However, obtaining patent rights and licensing revenue are not the only values important to universities and TTOs must balance those values against the value of academic discourse and the

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<sup>156</sup> Jeremy M. Grushcow, *Measuring Secrecy: A Cost of the Patent System Revealed*, 33 J. LEGAL STUD. 59, 82 (2004).

<sup>157</sup> For situations where the applicant is only seeking U.S. patent protection because of differing grace period rules outside of the U.S.

<sup>158</sup> Although they may take begin to take advantage of the one-year grace period if Europe and Japan adopt it. *See infra* at \_\_\_\_.

<sup>159</sup> Wesley M. Cohen, *Patents and Appropriation: Concerns and Evidence*, 30 J. TECH. TRANSFER 57, 68 (2005).

<sup>160</sup> Insert filing fees for both kinds as well as estimated prep costs from AIPLA survey

<sup>161</sup> *See supra* at \_\_\_\_\_. *See also* Arnold B. Silverman, *Proceed With Caution With U.S. Provisional Patent Applications*, JOM, at <http://www.tms.org/pubs/journals/JOM/matters/matters-0002.html> (visited Oct. 17, 2005).

importance of sharing fundamental information for others to build upon. This proposal should make it easier for that balancing to take place by making it easier for researchers to disclose embryonic research results while still retaining the ability to patent downstream innovations.

While university TTO reliance on the filing of “quickie” provisional patent applications to preserve patent rights is also understandable, it is problematic for several reasons. First, the heightened importance of the patent specification in claim construction analyses mandated by the Court of Appeals for the Federal Circuit in the recent *Phillips v. AHW* decision<sup>162</sup> puts a premium on well-drafted original applications.<sup>163</sup> While a shotgun approach to filing skimpy provisional applications may still result in enforceable patents for universities, the chances that patents based on such applications will be held invalid or not infringed is certainly higher now than before that decision. Also, academic researchers who rely on the filing of provisional applications for protection before publicly disclosing their work may become disillusioned with the patent process when the TTO does not follow up the provisional application with a non-provisional application.<sup>164</sup> As such, they may be more reluctant to participate in the patent process in the future, or may alter the focus of their research based on its commercialization potential.

As academic researchers generate more invention disclosures, TTOs have to make tough decisions about which inventions are worthy of patent protection. According to Thursby, et.al, “universities often seek patent protection only when commercial potential is clear, and this is often not the case for early stage technologies.”<sup>165</sup> Moreover, if an invention is developed with federal funds, the university must decide whether to take title to it under Bayh-Dole, a decision which brings with it an obligation to attempt to commercialize the invention.<sup>166</sup> Dr. Andrew Neighbour, Vice Chancellor of Research, at the University of California, Los Angeles provides a good assessment of the process:

If supported with any NIH grants or contracts (or any other federal agency), the invention will fall under the conditions of the Bayh-Dole Act requiring that we report the invention and decide whether or not to elect title and file for intellectual property protection through the US Patent and Trademark Office. To arrive at this decision, the TTO must exercise professional judgment based on a scientific, technical and business assessment to determine the commercial viability of the invention. Is it a profound scientific breakthrough with no commercial utility? Is it perhaps, simply a better mousetrap for which there is no market need? Or perhaps it

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<sup>162</sup> *Phillips v. AWH*, 415 F.3d 1303, 1315 (Fed. Cir. 2005).

<sup>163</sup> See discussion *supra* at \_\_\_\_.

<sup>164</sup> See discussion *supra* at \_\_\_\_.

<sup>165</sup> Jerry G. Thursby, Richard Jensen, and Marie C. Thursby, *Objectives, Characteristics and Outcomes of University Licensing: A Survey of Major Universities*, 26 J. TECH. TRANSFER 59, 68 (2001).

<sup>166</sup> 35 U.S.C. §202(b)(7).

is so new, that there are no comparable products in the market. . . .  
Technology transfer is not a straightforward process.<sup>167</sup>

Considering the early stage of most university technologies when they reach the TTO and the fact that TTO's seldom have enough licensing personnel to thoroughly evaluate all invention disclosures,<sup>168</sup> it is not surprising that many provisional applications are not followed up with regular patent application filings.<sup>169</sup> Dr. Neighbor further noted

A certain medical school dean once asked me why we didn't only patent 'the good ones.' Because many university inventions are so unrefined and untested, it is difficult to determine with certainty the future path for the majority of the inventions that faculty researchers disclose.<sup>170</sup>

Allowing the patenting decision to be made further along in the research cycle should enable TTOs to better assess commercial potential and avoid filing provisional applications that will never be supported through to patenting, as is described in the following scenario:

*Felicia is a PhD student who published some early, non-enabling (she believes) results of her research almost 1 year ago and is now approaching the deadline for filing a provisional application to avoid the use by the USPTO of her early publication in an obviousness rejection over her later work. Felicia's research is still not far enough along for the TTO to make a firm assessment of its commercial potential, and she is having difficulty convincing the TTO to file an application, yet she does not have the funds to try to prosecute the application herself. She feels sure that in a few more months, she will have strong results that would justify patent protection.*

Like Peter, Felicia could benefit from some additional time to decide whether to file a provisional application.

TTOs, the inventors they work with, and the larger scientific community, would be better served by both a longer total grace period, for those inventions that would still have meaningful value without foreign patent protection, and a true one-year grace period (which would require adoption by Europe and Japan) for those inventions, like

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<sup>167</sup> *From the Bench to the Bedside, supra.*

<sup>168</sup> See Thursby et. al., *Objectives, Characteristics and Outcomes, supra* note --, at 66 (noting that a number of TTO professionals reported having insufficient staff to determine the commercial potential of disclosed inventions).

<sup>169</sup> For example, the Georgia Institute of Technology's Office of Technology Licensing (OTL) reports that for the past four years the office has filed more than 3 times as many provisional patent applications as non-provisionals. Georgia Tech Research Corporation, *Technology Transfer Buzz* (Fall, 2004) [http://otl.gtrc.gatech.edu/OTL\\_Fall\\_2004.pdf](http://otl.gtrc.gatech.edu/OTL_Fall_2004.pdf), at p. 7.

<sup>170</sup> *NIH: Moving Research from the Bench to the Bedside: Hearings Before the Subcomm. on Health of the Committee on Energy and Commerce*, 108 Cong. (2003) (statement of Dr. Andrew Neighbor).

pharmaceuticals, for which both foreign and U.S. patent protection are critical. In each case, the grace period should then be followed by the filing of a rigorously drafted application based on a better assessment of the invention's commercial potential.

Why do we care if university researchers are able to file for patents? First, as has already been noted, although some inventions will be commercialized without patents, many technologies will not be commercialized without the assurance (or at least strong potential) of proprietary rights.<sup>171</sup> Since university-generated research is often embryonic at the point at which it is licensed, patents can provide the necessary incentive for inventors to continue developing the discovery, often in conjunction with an industry partner.<sup>172</sup>

For some, creating an opt-in expanded grace period will seem too radical, for others it will appear too tame. However, as an opt-in provision, it simply is designed to inject needed flexibility into the system to allow academic researchers to act upon the impulses that are in society's best interest, without destroying their own interests. Without such a provision, the likelihood of increasing academic discourse in the current university patenting environment is virtually non-existent.

## B. CAVEATS AND CONCERNS

Some may question whether university inventors should receive special treatment in the patent system. The answer is they should not, unless the special treatment will inure to the public good. Provisions such as 35 U.S.C. §41(h)(1), which allows universities to pay reduced patent filing and prosecution fees, the CREATE Act, and even the Bayh-Dole Act, are expressions of a belief that facilitating the patenting of inventions by universities, as well as university interaction with industry, will ultimately benefit society at large. The proposals outlined above pragmatically acknowledge this belief and seek to ameliorate some of the negative side effects of this policy decision on academic discourse and scientific knowledge sharing.

### i. Foreign Proprietary Rights

Since at least as early as the 1967 Report of the President's Commission on Patent Reform, there have been sporadic efforts to pass legislation that would convert the U.S. from a first to invent regime to a first inventor to file ("FITF") regime.<sup>173</sup> A move to FITF would create a "race" to the patent office in the sense that which ever true inventor

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<sup>171</sup> MOWERY, NELSON, SAMPAT & ZIEDONIS, *IVORY TOWER AND INDUSTRIAL INNOVATION: UNIVERSITY-INDUSTRY TECHNOLOGY BEFORE AND AFTER THE BAYH-DOLE ACT* 9-34 (2004).

<sup>172</sup> See Jerry G. Thursby and Marie C. Thursby, *Who Is Selling the Ivory Tower? Sources of Growth in University Licensing*, 00 *MGMT. SCI.* 1, 4 (2001).

<sup>173</sup> *To Promote The Progress of Useful Arts: Report of the President's Commission on the Patent System*, Subcommittee on Patents, Trademarks, and Copyrights of the Committee on the Judiciary, 90<sup>th</sup> Cong., S. Doc. No. 5, at 7 (15) (1967). For example, in 1992 alone two bills were introduced for that purpose: S2605, 102d Cong., 2d. Sess. 138 Cong. Rec. S5288 (Apr. 9, 1992), and HR4978, 102d Cong., 2d. Sess., 138 Cong. Rec. E1041 (Apr 10, 1992). This legislation was debated but not enacted. See 43 *BNA Pat. Trademark & Copyright J.* 519, 533 (1992).

filed first would be entitled to the patent. This move would bring the U.S. into harmony with the other major patent granting organizations, the European Patent Office (“EPO”) and the Japanese Patent Office (“JPO”) on the issue of invention vs. application priority.<sup>174</sup> The current legislative effort, H.R. 2795, was introduced in the spring of 2005 by Rep. Lamar Smith (R-Tx). If enacted, that legislation would eliminate priority disputes in the USPTO and courts since the time of invention would no longer be relevant, the first inventor to file a patent application covering the claimed invention would be entitled to the resulting patent.

While H.R. 2795 contains some provisions to aid global patent harmonization,<sup>175</sup> extending the prior art grace period as proposed in this Article would put the U.S. even further out of step with its global counterparts. The USPTO, European Patent Office (EPO), and Japanese Patent Office (JPO) account for 80% of patents worldwide. The JPO has a general six-month grace period but the EPO operates on an absolute novelty basis, with only limited exceptions for certain types of disclosures occurring within six months of the application filing date; quite different from the generous grace period provided in 35 U.S.C. §102(b).<sup>176</sup>

The vigorous debate in the European Patent Organization over the issue of establishing even a one year grace period suggests a proposal for a longer period, even one limited to the obviousness inquiry, would meet with significant resistance.<sup>177</sup> According to Mr. Jan Galama, a European industry representative and author of a position paper against the adoption of a grace period in Europe, “[i]f academics wish to compete in the economic world they should be prepared to relinquish old habits, such as early publication.”<sup>178</sup>

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<sup>174</sup> . See EPC Art. 54; Patent Law of Japan, Art. 28 (Law No. 121 of April 13, 1959, as amended by Law No. 220 of December 22, 1999) available at [www.wipo.org/clea.html](http://www.wipo.org/clea.html).

<sup>175</sup> In addition to instituting FITF, H.R. 2795 would eliminate other oddities of U.S. patent law including the best mode requirement and prior art provisions discounting inventive activity occurring outside of the United States. See Patent Reform Act of 2005, H.R. 2795, 109th Cong. (2005).

<sup>176</sup> For example, the European Patent Convention only provides a narrow six-month grace period for disclosures resulting from an “evident abuse” or display in a qualified international exhibition. EPC Art. 54(2). Moreover, the grace period dates from the filing of the actual European patent application, not a priority application, effectively eliminating the benefit of the grace period for foreign applicants who choose to take advantage of the Paris Convention right of priority after filing a first application in their home country. See *University Patents, Inc. v. SmithKline Beecham Biologicals SA, Materials and Methods for Herpes Simplex Virus Vaccination*, G 0003/98 (Enlarged Bd. Of Appeal July 12, 2000). The Japanese Patent Act also provides a six-month grace period that covers the same items as the EPC provision as well as disclosures made by the patent applicant. See Patent Law of Japan, Art. 30 (Law No. 121 of April 13, 1959, as amended by Law No. 220 of December 22, 1999) available at [www.wipo.org/clea.html](http://www.wipo.org/clea.html).

<sup>177</sup> Jan Galama, *Expert Opinion on the Case for and Against the Introduction of a Grace Period in Europe*, European Patent Office, at <http://www.european-patent-office.org/news/pressrel/pdf/galama.pdf> (last modified Apr. 30, 2000). See also European Commission, *An Assessment of the Implications for Basic Genetic Engineering Research of Failure to Publish or Late Publication*, Europa, at [http://europa.eu.int/comm/internal\\_market/en/indprop/invent/com02-2en.pdf](http://europa.eu.int/comm/internal_market/en/indprop/invent/com02-2en.pdf) (last modified Jan. 14, 2002).

<sup>178</sup> *Id.*

However, Europe may yet be induced to institute a one year grace period, which would breath new life into the nominal one-year grace period of 102(b) that U.S. inventors seeking foreign protection (of particular importance for pharmaceutical patents) simply cannot take advantage of currently. Professor Dr. Joseph Strauss, in a detailed opinion countering the view of Mr. Galama, argued for the adoption of a general grace period noting in particular the needs of academic researchers:

Account has to be taken of the growing significance of academic and research institutes as patent applicants and generators of innovation relevant knowledge. There is a need to facilitate early publication of research results. Disclosure in parallel to or only after filing a patent application does not entirely meet this need since it is not always feasible to file a patent application at an early stage and in any event the absolute bar on filing for previously disclosed inventions is disproportionate to any inadvertence on the part of the inventor. It is not only inventors who suffer whenever a useful invention is excluded from patent protection but society at large. Statistics from Japan, US and Germany make clear that early disclosure is of particular importance for academic/research institutions and independent inventors and the needs of this sector should be given more recognition in Europe.<sup>179</sup>

Many European countries had grace period provisions before joining the European Patent Convention, and many still retain varying types of grace periods.<sup>180</sup> Moreover, the Patent Reform Act of 2005, H.R. 2795, contains an incentive for Europe and Japan to adopt a one-year grace period: until they do, foreign inventors will not be able to take advantage of the U.S. grace period when filing U.S. applications based on earlier-filed foreign applications.<sup>181</sup>

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<sup>179</sup> Professor Dr. Joseph Strauss, *Expert Opinion on the Introduction of a Grace Period in European Patent Law*, European Patent Office, at <http://www.european-patent-office.org/news/pressrel/pdf/straus.pdf> (last modified May 8, 2000). Dr. Strauss also noted that even though industry in Europe is vigorously opposed to a grace period, in Japan, where the grace period must be invoked, 47% of patent applications invoking the grace period were filed by large companies. He also noted the greater significance of the grace period to independent and academic inventors, since the grace period was invoked in 43% of all of their applications.

<sup>180</sup> See European Commission, *Grace Period and Invention Law in Europe and Selected States*, IPR Helpdesk, at [http://www.ipr-helpdesk.org/documentos/docsPublicacion/pdf\\_xml/8\\_GracePeriodinventionLaw\[0000004514\\_00\].pdf](http://www.ipr-helpdesk.org/documentos/docsPublicacion/pdf_xml/8_GracePeriodinventionLaw[0000004514_00].pdf) (visited Oct. 10, 2005) (describing grace periods in Portugal, Spain, Russia, China, Canada, Japan, and other countries).

<sup>181</sup> Patent Act of 2005, H.R. 2795, 109th Cong. Sec. 10(h) (2005). The provision reads:

Before the date, if ever, that the Director of the United States Patent and Trade-mark Office publishes a notice in the Official Gazette of the Office declaring that both the European Patent Convention and the patent laws of Japan afford inventors seeking patents a 1-year period prior to the effective filing date of a claimed invention during which disclosures made by the inventor or by others who obtained the subject matter disclosed directly or indirectly from the inventor do not constitute prior art, the term

In fact, the experience of the European Union where no meaningful grace period currently is available provides a clear example of the importance of extending grace in the university context:

In order to contribute to scientific discourse and not to endanger the success of their publications, researchers often follow the traditional strategy of a quick publication. Questions of commercial exploitation - if they are considered at all - are usually secondary. This leads to situations where researchers often overlook the fact that the prompt and ill-considered distribution of an invention without a previous patent application will cause the complete and irremediable loss of all patent rights, and, finally, the fundamental limitation of economic usability. This is one of the main reasons why the inventions generated at universities [in Europe] . . . are rarely patented, although they are often valuable and exploitable.<sup>182</sup>

## ii. Trading Costs

Using patent policy to facilitate the transfer of technology out of universities has imposed significant costs on academic discourse over the past several years. Thus it is not surprising that extending the grace period in order to improve academic discourse likely will entail costs as well, both for third parties and university inventors. Costs to third parties could include increased uncertainty regarding the availability of publicly disclosed information for use free from proprietary claims. Even with immediate application publication, extending the grace period to a total of eighteen or twenty-four months from the first filing date means that third parties may have to wait an additional six to twelve months before seeing initial application claims. This is because a provisional application, which is often the first filed application, is not required to include claims.<sup>183</sup> This may not be a major disadvantage, however, since claims often change significantly during prosecution and beyond in any event. In fact, patentees are even allowed to broaden claims up to two years *after* a patent issues.<sup>184</sup> Moreover, as a result of the *Phillips v. AWH* decision discussed above,<sup>185</sup> applicants may begin to include

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“effective filing date” as used in section 102(a)(1)(A) of title 35, United States Code, shall be construed by disregarding any right of priority under section 119 or 365 of title 35, United States Code, except that provided under section 119(e) of title 35, United States Code.

<sup>182</sup> European Commission, *Grace Period and Invention Law in Europe and Selected States*, IPR Helpdesk, at [http://www.ipr-helpdesk.org/documentos/docsPublicacion/pdf\\_xml/8\\_GracePeriodinventionLaw\[0000004514\\_00\].pdf](http://www.ipr-helpdesk.org/documentos/docsPublicacion/pdf_xml/8_GracePeriodinventionLaw[0000004514_00].pdf) (visited Oct. 10, 2005).

<sup>183</sup> See Manual of Patent Examining Procedure §601, available at [www.uspto.gov/patents](http://www.uspto.gov/patents).

<sup>184</sup> 35 U.S.C. §251.

<sup>185</sup> See *supra* at \_\_\_\_.

claims in provisional applications to aid arguments of adequate claim support in the event of future litigation.<sup>186</sup>

For university inventors, costs of opting in to the extended grace period could include less overall patent protection, either as a result of eliminated foreign rights, or the efforts of third parties to patent variations of earlier disclosed technology. An extended grace period may increase the chances that a third party, aware of the disclosure, may seek to obtain a patent on the disclosed subject matter in advance of the true inventor.<sup>187</sup>

Under the current U.S. patent system, 35 U.S.C. §102(f) prevents the patent of inventions by other than a true inventor who actually conceived of the claimed invention. While a form of this requirement would remain even if the United States changes to a first-inventor-to-file regime as is proposed in H.R. 2795, third parties may be able to file applications on improvements of earlier disclosed technology in advance of university applicants thus potentially limiting the scope of subject matter the university researcher ultimately could have patented. However, if a “Coalition Draft” type provision were enacted, the potential for such third party activity would be greatly minimized since prior public disclosure of claimed subject matter would bar third parties from patenting it.<sup>188</sup>

Moreover, even without the protection envisioned in the Coalition Draft, there is no guarantee the university researcher would have conceived the same improvements as a third party inventor. Consequently, the public ultimately would benefit in both of these scenarios since more information will have been injected into the public domain in accordance with the original academic mission. As Professor Eisenberg wisely notes: “[p]atents undoubtedly have a critical role to play in facilitating technology transfer in some contexts. But they can also interfere with technology transfer and with the broader goal of promoting continuing technological progress. These goals may sometimes be better served by allocating new knowledge to the public domain.”<sup>189</sup>

### iii. Unresolved Issues

Unfortunately, extending the prior art grace period will not necessarily impact the other important factor driving secrecy in scientific academic research: disclosure

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<sup>186</sup> See Dennis Crouch, *Including Claims in Provisional Patent Applications?*, Patently-O: Patent Law Blog, at [http://patentlaw.typepad.com/patent/claim\\_drafting\\_tips/index.html](http://patentlaw.typepad.com/patent/claim_drafting_tips/index.html) (last modified Sep. 16, 2005).

<sup>187</sup> However, university research is generally early stage research requiring years before it is commercializable. If an invention appeared to be close to commercialization (making it an attractive candidate for third party “stealth patenting”), a university likely would not wait two years to file an application and would simply bypass the opt-in provisions.

<sup>188</sup> See Coalition for 21st Century Patent Law Reform, *Coalition Draft Mark-up of Amendment in the Nature of a Substitute to H.R. 2795 Offered by Mr. Smith of Texas*, at [http://www.fr.com/news/2005-09-14\\_Coalition\\_Draft.pdf](http://www.fr.com/news/2005-09-14_Coalition_Draft.pdf) (last modified Sept. 1, 2005).

<sup>189</sup> Rebecca S. Eisenberg, *Public Research and Private Development: Patents and Technology Transfer in Government-Sponsored Research*, 82 VA. L. REV. 1663, 1727 (1996).

restrictions in industry sponsorship agreements.<sup>190</sup> According to Thursby et.al., half of the research-sponsoring companies surveyed include disclosure restrictions in 90% of such agreements.<sup>191</sup> The restrictive terms may preclude a researcher from publicly disclosing research results before and several months after the filing of a patent application covering the discovery. Consequently, absent other changes to such agreements, an extended grace period would not benefit researchers bound by contract to limit and/or delay disclosures.

Industry sponsorship is important, but federal funding is still 60% of university funding while industry funding is just 6%.<sup>192</sup> However, some industry-university research collaboration agreements include disclosure restrictions even though the collaboration is supported by federal funding.<sup>193</sup> Amending Bayh-Dole to bar such restrictions on outputs created with the use of federal funds could provide an additional lever to increase prompt scientific discourse by members of the academy.

While relying on universities to forsake patenting and sponsored research for the sake of academic discourse is unrealistic, there is a role for university administrators to play in reestablishing the primacy of knowledge sharing norms. Institutional policy-makers can also choose to bar overly restrictive disclosure provisions in industry sponsorship agreements. The *Statement on Academic Freedom*, drafted during the first annual Global Colloquium of University Presidents held at Columbia University, January 18-19, 2005, seems to provide a mandate for such action to be taken by universities at it states:

Academic institutions bear a heavy responsibility to protect the scholars and students who work with them from improper pressures . . . . Universities must maintain and encourage freedom of inquiry, discourse, teaching, research, and publication, and they must protect all members of

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<sup>190</sup> See, e.g., Eisenberg, *Proprietary Rights and the Norms of Science*, *supra* note --, at 231; John P. Walsh & Wei Hong, *Secrecy is Increasing in Step with Competition*, 422 NATURE 801, 802 (2003).

<sup>191</sup> Thursby et. al., *Objectives, Characteristics and Outcomes*, *supra* note --, at 68.

<sup>192</sup> *AUTM Licensing Survey: FY 2003 Survey Summary*, Association of University Technology Managers, at <http://www.autm.net/surveys/dsp.surveyDetail.cfm?pid=16> (visited Oct. 9, 2005). See also Risa Lieberwitz, *Confronting the Privatization and Commercialization of Academic Research: An Analysis of Social Implications at the Local, National, and Global Level*, 12 IND. J. GLOBAL LEGAL STUD. 109, 123 (2005) (“Given the continued dominant role of federal funding to support academic research, the Bayh-Dole Act remains the most important instrument for encouraging universities to increase their market activities through patents and licenses of publicly funded research results.”). According to the AUTM survey, the balance of research funding comes from state and local governments, foundations, individuals, and the universities themselves. While relatively low compared to federal funding, industry funding levels have significantly increased over the past few decades since in 1970, the share of university research funding provided by industry was only 2.6%. Wesley M. Cohen, Richard Florida, Lucien Randazzese, and John Walsh, *Industry and the Academy: Uneasy Partners in the Cause of Technological Advance*, in CHALLENGES TO RESEARCH UNIVERSITIES 171, 183 (Roger G. Noll, 1998).

<sup>193</sup> Wesley M. Cohen & John Walsh, *Public Research, Patents and Implications for Industrial R&D in the Drug, Biotechnology, Semiconductor, and Computer Industries*, working paper, on file with the author (Aug. 2000).

the academic staff and student body against external and internal influences that might restrict the exercise of these freedoms.<sup>194</sup>

University action to facilitate scientific academic discourse would be a welcome adjunct to the extended grace period proposals because patent law rules do not operate in a vacuum and the ultimate impact of implementing the proposals can only be surmised. Just as the full effects of Bayh-Dole could not be anticipated at the time of its enactment due to the confluence of technological advances and judicial action that greatly increased its impact, so the full effects of these proposals cannot be ascertained with certainty *ex ante*. What seems certain is that without some relaxation in patent rules here and abroad, disclosure norms will continue to deteriorate as the technology transfer boom expands to more and more universities.

## CONCLUSION

*Academic freedom does not exist for its own sake; it exists in the interests of advancing scholarly enquiry. There is a reciprocal and mutually reinforcing relationship between academic freedom and scholarly inquiry, and those who care about preserving academic freedom-which presumably includes all of us-should be very careful to identify forces which diminish or undermine scholarly enquiry.*<sup>195</sup>

For good or ill, patent law and policy and university technology transfer are inextricably linked. The Bayh-Dole and CREATE Acts provide clear examples of Congress choosing to facilitate technology transfer policy through patent law. Conversely, the patent policy in effect as a result of the *In re Klopfenstein* decision (as expounded through the Federal Circuit's statutory interpretation) has the potential to further chill the pre-patent dissemination of academic research and hamper innovation.<sup>196</sup> The statutory amendments I am proposing would allow Congress to further facilitate university technology transfer consistent with the Bayh-Dole and CREATE Acts while ameliorating some of the problems created by the blending of patent law with the academic enterprise.

Will extending the prior art grace period combined with early publication, a real experimental use exemption, and a ban on disclosure restrictions resolve all of the conflicts surrounding university-industry technology transfer? Of course not. Are these

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<sup>194</sup> *Report of the First Global Colloquium of University Presidents*, Columbia University, Office of the President, at <http://www.columbia.edu/cu/president/communications%20files/globalcolloquium.htm> (visited Jul. 5, 2005). Hosting responsibilities for the Colloquium will rotate among Columbia University, the University of Pennsylvania, New York University, Princeton University, and Yale University, the five sponsoring institutions.

<sup>195</sup> Peter MacKinnon, *Administering and Protecting Academic Freedom*, in PURSUING ACADEMIC FREEDOM: "FREE AND FEARLESS"? 37, 40 (Len M. Findley and Paul M. Bidwell, 2001).

<sup>196</sup> See *In Re Klopfenstein*, 380 F.3d 1345, 1352 (Fed. Cir. 2004) and discussion *supra* at \_\_\_\_.

tools that can alleviate some of those tensions? I believe so. Just as changes in patent law and policy largely created the growth and growth pains of technology transfer, further changes in patent law can be expected to have meaningful impacts on the future of technology transfer in ways that cannot fully be predicted.

In order to optimize the patent system's ability to promote the progress of science and the useful arts, the "one-size-fits-all" approach must give way to the realities of the changing technology creation landscape. As its name implies, an extended grace period will bestow unmerited favor on researchers choosing to take advantage of it; they will receive grace without having done anything to deserve it.<sup>197</sup> But if that extension of "grace" can serve the larger societal goals of increasing academic discourse and knowledge dissemination within the academy while enhancing the transfer of technology outside of those ivory walls, the resulting benefits will be nothing short of "amazing."

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<sup>197</sup> Although they will have to agree to immediate application publication, see discussion *supra* at \_\_\_\_\_.