UNIVERSITY OWNERSHIP OF
FACULTY-GENERATED INVENTIONS IS QUESTIONABLE

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I. Introduction

Amid great hoopla, university faculty are making scientific breakthroughs in areas like robotic engineering and molecular genetics. Universities are setting up offices specifically to commercialize these and other discoveries. Industry support is encouraged as a way of funding this research. Furthermore, joint ventures between private companies and universities are heralded as a significant step in the country's race for productivity in a global economy.

This flurry of activity and publicity overlooks a fundamental and threshold issue: Who owns the research and inventions—the golden eggs from which wealth and reputation hopefully will grow? Universities and faculty apparently assume that the university, as the employer, owns faculty research. This article questions this fundamental but flawed assumption.

It begins with a discussion of the common law rights. Despite what is generally assumed—long established legal principles grant to employees, such as faculty, the inherent right of ownership to their inventions. This inherent right is abrogated only by an explicit agreement.

The article then explores the common practice of universities claiming ownership of faculty-generated inventions through written policies. Universities' various rationales, however, are questionable. They do not justify universities' ownership rights. The policies themselves may not even be enforceable.

Finally, the article proposes compelling policy arguments for faculty owning their research and inventions.
II. University Faculty Own Their Inventions as a Matter of Law

A. United States v. Dubilier Condenser Corporation

United States v. Dubilier Condenser Corporation, decided in 1933, is the landmark case for determining who owns employee-generated inventions. Its principles have been consistently applied to a broad range of employment settings. The facts of Dubilier are strikingly analogous to those of university faculty engaged in research.

Dubilier involved the rights of two employees of the Bureau of Standards of the U.S. Department of Commerce, Francis Dunmore and Percival Lowell. The Bureau's main function was to investigate and select government standards for instruments and methods used in science, engineering, manufacturing, commerce, and education. Its research was sometimes conducted on behalf of other government departments, municipal bodies, and private businesses. While the Bureau's general expenses were publicly financed, the Bureau often was reimbursed for research costs by the entity for which the particular research was being conducted. Like universities, the Bureau carried out these varied activities while adhering to its primary public mission.

The Bureau's organizational structure also resembled that of university administration. From the top down, it was organized into divisions, divisions organized into sections, and sections organized into groups. Each level had an administrative chief.

Dunmore, an associate physicist, and Lowell, a laboratory assistant, were full-time laboratory researchers in the airplane radio group of the radio section of the electrical division. They worked on a research project for the Army Air Corps that dealt with airplane radios, including the problem of operating a relay for remote control of airplane bombs and watercraft torpedoes. Dunmore resolved this problem and related problems. During this process, he "was wrestling in his own mind, impelled thereto solely by his own scientific curiosity, with the subject of substituting house lighting alternating current for direct battery current in radio apparatus."

Over the next two years, Dunmore and Lowell conceived and invented three products applying the alternating current concepts to broadcast reception and power amplification in loudspeakers. The researchers were not assigned to work on these inventions; they worked on them voluntarily. They pursued this research while on the job, however, using Bureau resources and facilities, and with the knowledge and encouragement of their supervisors. Their conduct was consistent with the norms of their work environment.

In determining whether the Bureau, as the employer, or Dunmore and Lowell, as the employee inventors, owned these inventions, the Supreme Court laid out these core principles.
The analysis focuses on the fundamental nature of the employee's job. One employed to make an invention, who succeeds, during his term of service, in accomplishing that task, is bound to assign to his employer any patent obtained. The reason is that he has only produced that which he was employed to invent. His invention is the precise subject of the contract of employment. On the other hand if the employment be general, albeit cover a field of labor and effort in the performance of which the employee conceives the invention for which he obtained the patent, the contract is not so broadly construed as to require an assignment of the patent.

Upon analysis of the fundamental nature of Dunmore and Lowell's jobs, the Supreme Court concluded that they were not hired to invent. Furthermore, they never assigned their inventions to the Bureau. Thus, Dunmore and Lowell retained their inherent rights to ownership.

In summary, Dubilier explains that the employer owns the invention only if the employee is specifically hired to invent. Even if the employee is specifically hired to invent, the employer is entitled only to that invention which the employee was hired to invent and not to any other invention. While employees may assign their inventions to their employers, the courts are reluctant to infer such an assignment. These principles, the Dubilier court explains, are based on "the peculiar nature of the act of invention." Furthermore, the employer has the burden of proving that these conditions exist.

B. Applying the Dubilier Principles

While many cases apply and reconfirm the Dubilier principles, there are few cases dealing specifically with an ownership dispute between faculty inventors and university employers. Numerous cases like Dubilier exist, however, that deal with researchers, scientists, and engineers in a range of institutional settings.

As part of their research activities, these employees, like faculty, may make discoveries that have the potential for practical application. They may devote full time to research, or they may have other responsibilities, such as teaching or administration that demand as high a priority as research. Like faculty, the employees use their employers' facilities, personnel, and work time for their research. Their research results, including any inventions, typically are related and
often flow directly from their research and other job-related activities.

Thus, Dubilier and its progeny may be used by analogy to determine if faculty are hired to invent.28 These cases raise issues that are likely to be raised in future university-faculty disputes. In particular, they consider whether professionals are classified as "hired to invent" (1) if research is within their job responsibilities, or (2) if the employer's resources or time are used to develop the inventions.

1. Research as Part of Faculty Responsibilities

The principles of Dubilier, and their application by Dubilier and other courts, make clear that typical university faculty members would not be considered employees that are "hired to invent" merely because research is part or all of their job responsibilities.

In Kaplan v. Johnson,29 for example, Dr. Irwin Kaplan, while employed at a Veterans Administration hospital, conceived and invented a camera for whole body imaging. The invention was made at least partially during working hours and with the use of hospital facilities, equipment, money, and other employees. At the trial level, the hospital had several arguments for its claim that it owned the invention:30 (1) Kaplan was "hired to invent" because research was part of his job and the invention was related to his field of work; and (2) he used hospital resources and time.31

The court rejected the claim that Kaplan was hired to invent because research was part of his job. For fifteen of his twenty years employment at the hospital, he was chief of nuclear medicine. His job included administrative, clinical, teaching, and research responsibilities. While recognizing that the hospital administration expected him to engage in research, the court distinguished between "employment calling for general research work and employment with a specific objective of inventing."32 Employees who voluntarily assume inventive activities cannot implicate themselves. As in Dubilier, the Kaplan court recounted, the employees also performed and supervised research. Kaplan has even a stronger case than the Dubilier employees, the court continued, because they were full-time researchers while Kaplan had other non-research related duties.

Indeed, Dubilier requires that the employees' obligation to invent be specific.33 The Supreme Court's intent to craft a very narrow definition of "employees who are hired to invent" is evident from its illustrative explanations. For example, devising and making improvements that may result in an invention is not the same as being hired to invent; invention as a consequence of one's work is insufficient.34 Being hired to
conduct basic research, described in Dubilier as "finding out the laws of nature, . . . fruitful research as to the operation of natural laws" also is distinguished from being hired to invent. Likewise, the argument that an employer owns an invention because it is in the employees' field of employment, is summarily rejected. Further, one must be hired to invent the very invention at issue. Employees do not forfeit their ownership rights to invention X if, for instance, they are hired to invent invention Y.

2. Use of University Resources and Time

Like the hospital employer in Kaplan, universities may argue that faculty who use university facilities, time, and personnel in developing their inventions should be classified as employees hired to invent. For example, the university may purchase specialized equipment or pay the filing fees for patent applications. Even if faculty are not hired to invent, universities could claim that use of university resources, such as these should be a sufficient basis for forcing faculty to forfeit their ownership interests. Courts consistently reject both of these arguments, including under circumstances where researchers develop their inventions while on the job and with the use of their work facilities and equipment.

This conclusion is consistent with the faculty-university relationship. The bargain is for faculty to conduct in good faith their teaching and research activities in exchange for the universities providing pay, the necessary resources, and time. Faculty have not agreed to exchange their use of university resources for the university's right to own their inventions.

The courts, however, have recognized that the employer should not always be left empty-handed. As summarized in Dubilier, in the interest of equity, and in exchange for the employee's use of the employer's "time, facilities and materials to attain a concrete result," the employer may have a nonexclusive right to use the invention in its business. While this shop right allows the employer to manufacture and sell the invention, it does not allow the employer to assign or sublicense its interest in the invention. These are prerogatives of the employee, who retains ownership.

Endowing the university with a shop right, however, may not be as appropriate for a university employer as it is for a business employer. A business employer reaps benefits from an employee's invention if the employer can manufacture and sell the invention. Universities usually reap benefits from faculty inventions in a different way. If the inventions enhance the faculty's professional reputation, the university's reputation is likewise enhanced. While not always the case, the university also generally is not in a position to use the invention directly. As an academic institution, it probably does not have
the necessary resources, capabilities, or interest to exercise a shop right.

In summary, Dubilier and other courts make clear that the typical university faculty member would not be considered an employee that is specifically "hired to invent." Faculty are not directed to invent specific devices or to solve specific problems. Even if there is a research agreement between faculty and research sponsors, the participants often leave unclear what specific results should be. The facts that faculty have research responsibilities and use university resources in conducting research do not alter this conclusion.
III. Universities Claim Ownership of Faculty Inventions

Despite the Dubilier principles, many universities are establishing policies that presume university ownership. Universities' rationales for ownership, however, are questionable. The following discussion explores their reasoning. It begins with a summary of university administrators' increasing interest in the commercialization of faculty research and the policies they are developing to accommodate that interest.

A. Universities' Increasing Entrepreneurial Activities

In recent years, universities have become more entrepreneurial. Several reasons help explain this trend, including government incentives, industry enticement, and institutional self-interest. Both state and federal governments have legislated programs and policies with the intent of encouraging universities to collaborate with businesses in producing innovative technology and products. Pennsylvania, for example, established the Ben Franklin Partnership Program that advises and funds these joint ventures. In 1980, the federal government instituted a new uniform policy permitting universities who receive government funding to elect to take title to resulting inventions.

Likewise, businesses have enticed universities and faculty to increase the commercialization of university research. Businesses view talented faculty as a rich, comparatively untapped source of product innovation. Universities view companies as attractive business partners because they are a source of substantial funds. Since government funding of university research has diminished in recent years, universities have courted business as a possible substitute source. In addition, companies offer invaluable commercial expertise.

While these new government initiatives and business courtships opened the door to university entrepreneurship, it was the promise of wealth and treasures within those doors that provoked university action. Indeed, some university research has resulted in highly profitable products. In academic year 1989, the University of California received $9.8 million in income from the patent licensing of various faculty inventions. The school projects that by the year 2000, income will be at the $40-50 million level. Between 1929-89, the Wisconsin Alumni Research Foundation of the University of Wisconsin received approximately $50 million in income from patent licensing. These success stories, however, obscure the realities. The probability of an invention coming to market, much less being phenomenally profitable, is low. Nonetheless, the promise of the "really big one" has motivated universities to redirect some of their institutional efforts toward entrepreneurial endeavors.
Universities are tempted by these entrepreneurial activities because they believe that ultimately these projects will produce money to help institutional activities. Besides this pecuniary institutional self-interest, universities may have other interests. They may believe that these entrepreneurial activities eventually will yield societally beneficial products or that industry and university collaboration is positive in itself.

B. Survey of University Policies

These entrepreneurial opportunities raise a number of issues for universities. As stated in Harvard University's policy:

Thus, as schools are formulating their policies regarding faculty discoveries, they may consider the following issues: (1) the university's objectives and philosophy; (2) the scope of the policy (e.g., which employees, discoveries, and time periods are covered); (3) the rights and duties of the university, faculty inventors, university units such as the faculty inventors' departments, and research sponsors; (4) the relationship between these parties regarding such issues as ownership and rights associated with ownership; and (5) the procedures used to implement the policy (e.g., disclosure of inventions).

The author conducted a survey of the policies of the preeminent research universities. The survey reveals that universities' responses to these issues is in a transition stage. Many schools have recently revised or are in the process of reevaluating their policies. For instance, while some policies currently do not apply to all types of discoveries, the trend is to formulate comprehensive coverage. While some schools are attempting to treat virtually all faculty intellectual work the same way, others are developing different treatment for different classes of works. Faculty work products that are copyrightable and faculty-generated software, in particular, often are treated differently.
Unfortunately, with a few exceptions, universities are not creatively resolving issues dealing with faculty rights. Although universities use different language, the survey indicates that university policies follow common approaches: the resource-provider approach, the maximalist approach, and the supra-maximalist approach. As the following discussion explains and the following table illustrates, the practical distinctions between these approaches often are blurred.

<table>
<thead>
<tr>
<th>Approach</th>
<th>Basis for University Ownership</th>
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<tbody>
<tr>
<td>Resource-provider</td>
<td>If faculty use university resources.</td>
</tr>
<tr>
<td>Maximalist</td>
<td>If faculty (1) use university resources, or (2) develop inventions in &quot;course of employment&quot;.</td>
</tr>
<tr>
<td>Supra-maximalist</td>
<td>Most expansive. E.g., University claims any invention that faculty develops, whether or not faculty use university resources or develop invention during course of employment.</td>
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</table>

1. Resource-provider Approach

Some universities claim ownership of faculty-generated research and inventions only if faculty have made significant use of university resources. This approach can be labeled the "resource-provider" approach since it is based on the notion that the university is entitled to ownership only if it significantly contributes to its development. While the common law rejects the use of employer's resources as a sufficient basis for employer ownership of inventions, universities apparently feel it is justified.

University policies generally do not define comprehensively "university resources," but the term presumably includes work time, facilities, personnel, equipment, and funds. The term is intended to be broadly interpreted, with the only stated exceptions being the faculty's own offices and libraries.

MIT's policy further illustrates. It is stated in the negative, providing that there is not a "significant use" of university resources so long as (1) a minimal amount of university funds is used, (2) there is minimum time using MIT facilities, (3) the invention is unrelated to a specifically assigned research area under a sponsored project, and (4) the development is made on the faculty's "personal, unpaid time." While the first three requirements seem reasonably circumscribed, the last requirement that the development must be made on
personal, unpaid time greatly expands the University's claim. Reasoning that the inverse of faculty's personal, unpaid time is faculty's professional, paid time, the University could claim all inventions that faculty develop in the "course of employment." Thus MIT, although ostensibly following a resource-provider approach, effectively may be using the maximalist approach described next.

2. Maximalist Approach

The most common approach is for the university to claim ownership to two classes of inventions: (1) from the course of the faculty's employment and (2) from the faculty's use of university resources.\textsuperscript{74} If the university decides it does not wish to develop these inventions, ownership presumably reverts to faculty.\textsuperscript{75} Because this approach maximizes the university's rights, it can be called the "maximalist" approach.\textsuperscript{76}

The maximalist approach typically does not elaborate on what is meant by "the course of employment" or the employee's regular duties. As do others, Yale University's policy suggests an expansive interpretation. It includes "teaching, research, and other intellectual and administrative activity by faculty . . . ."\textsuperscript{77}

In application, the scope of faculties' "course of employment" would be very extensive. Unlike some 9 to 5 jobs in business, faculty's professional and nonprofessional lives are not marked by arbitrary designations of when or where they work. The nature of the work and the work ethics are not compatible with punching a clock or restricting one's work only to the office. Faculty are self-directed. They may do as much research at their home in the evening in front of their computer or while conducting field research in the summers, as they would during the more typical workday hours at the office. Except for specific teaching and other designated responsibilities, faculty have wide flexibility in how, when, and where they conduct their work. Deans emphasize quality and sometimes quantity of their work results; they do not emphasize the process by which these results are accomplished.

In addition, a faculty's professional responsibilities often extend beyond direct teaching and research activities. They also may include participation in professional associations, university committees, and community projects.\textsuperscript{78} Because of this expansive nature of faculty's professional life, it is difficult to imagine circumstances where faculty's inventions would not result from activities within their course of employment.

In addition to claiming inventions arising from the faculty's scope of employment, the maximalist approach also allows the university to claim inventions arising from the
faculty's use of university resources. Thus, universities using this approach would claim all inventions that would be claimed under the resource-provider approach, plus those developed in the faculty's course of employment. Stated in the inverse, the university would have "no vested interest in inventions" only if faculty conceive and develop them "entirely on their own time and without the use of university facilities." 79

Consider this example. Fact 1: A mathematics professor attends a regional mathematics conference. After hearing a paper presentation, the professor discusses the paper with a colleague at the conference and they conceive of an idea for an invention. Fact 2: The professor decides to work on her idea, which is related to her general research area. Fact 3: She continues her research, using her computer at home in the evenings and on weekends. Fact 4: She also uses her university office and secretary to type up her research notes, professional correspondence, and publications regarding her research.

Under the maximalist approach, the four facts collectively would justify the university's claim to any resulting inventions. The expansiveness of this approach, however, is best illustrated by the conclusion that any one of the facts theoretically would justify university ownership. Attending the conference is in the course of her employment; conducting research in her general research area is in the course of her employment; working on her research at home (or any other location) is within her scope of employment; and having her secretary type up research-related materials constitutes the use of university resources.

3. Supra-maximalist Approach

As illustrated in the table, some universities define their ownership rights even more broadly than the maximalist approach. 80 This "supra-maximalist" approach provides another basis, in addition to the course of employment and use of university resources, for the university claiming ownership. For example, the University of Texas and the University of Illinois, claim inventions arising from faculty's course of employment, use of university resources, and research funded by a sponsor. 81 This goes further than the more typical approach of making faculty rights merely subject to the terms of the sponsors' funding agreements. 82 Presumably, these universities want maximum flexibility in negotiating terms with sponsors. 83

Under the supra-maximalist approach, a university could go even further--claiming ownership of inventions and resulting patent rights from all faculty activities, including those developed outside the scope of employment. For example, subject to state law, the University of California may claim all inventions that faculty develop during the time period they are employed by the University. 84 Likewise, the University of Pittsburgh's policy claims ownership and control of the
"worldwide patent rights which result from activities of its faculty, staff and students," whether or not University time or resources are used to develop the underlying inventions. The resource-provider, maximalist, and supra-maximalist approaches all appear to make the same presumption: the university owns faculty inventions. Any faculty rights, including the sharing of royalties, are primarily given out of university benevolence and generosity. This presumption is contrary to the common law, which provides that faculty own their inventions. How then do universities justify their policies?

As one university administrator in charge of his university's patent policy explained: "You've got to understand the way it is at universities. Universities do not look at legal niceties. Their attitude is that faculty won't sue them. Like in business, the university is the employer and they own faculty work. On the other hand, they do not want to push the issue since some really vocal faculty might complain. Most faculty are oblivious to their rights. [Even] if they did know their rights, they would be afraid to push it . . . so the university's position is not tested." But what if faculty did test these policies? How would they proceed?

C. University Rationales for Ownership Are Questionable

Universities are likely to invoke various rationales in defense of their policies of university ownership of faculty inventions. These rationales are: (1) all universities follow this policy; (2) this policy is consistent with business practice; (3) this policy is legally enforceable; (4) the federal government requires this policy; and (5) universities own the inventions as a matter of law. This section analyzes each of these rationales.

1. Pattern of Other Universities

Many universities believe that university ownership is what all universities do; it is equivalent to an industry practice. As discussed, most universities do claim ownership of patentable inventions. The exceptions, however, are notable.

The general policies of Stanford University and the University of Wisconsin, for example, provide that whenever possible, faculty own their inventions. Under the University of Minnesota policy, only inventions arising from sponsored research are subject to the university's claim of ownership. Harvard University's policy is distinctive in a number of ways, reflecting both a recognition of faculty rights and the desirability of developing faculty research. Except for inventions primarily concerned with medical diagnostics and therapeutics or public health, faculty have the first right to title subject to their diligent development of the invention.
Thus, not all university policies provide for comprehensive university ownership.

Moreover, as these schools demonstrate, a policy favoring faculty rights to ownership does not appear to hamper the university's ability to attract research sponsors. Stanford University, for example, received more federal funding in 1987 than any other of the preeminent research universities except for one. In addition, a faculty-oriented policy does not appear to diminish the university's overall inventive productivity. It may quite plausibly increase it. For example, Stanford University, the University of Wisconsin, and Harvard University were all among the top ten universities in the number of patents awarded to universities in 1988.

So while it appears that universities with more faculty-oriented policies have little to lose, universities that deny faculty ownership rights may be at risk. Schools going along with the "industry practice" may believe their policy will not interfere with their ability to attract faculty. They presume that when faculty are faced with offers to join the faculty of more than one university, they will not distinguish between the schools on the basis of these policies. Faculty being aggressively recruited may well distinguish, however, between schools on the basis of their position on ownership of faculty inventions. For example, Stanford University officials acknowledge that their policy is intended to give them an advantage in recruiting faculty.

Universities which view other universities as their only competitors for talented faculty also overlook other possibilities. Faculty, especially those likely to innovate commercializable products or inclined toward entrepreneurial activities, have employment opportunities in business. Not only do existing companies recognize their potential, but these individuals may start their own companies. If they join existing companies, they are in a position to negotiate to retain ownership of their inventions or to negotiate terms that amply compensate for the assignment of their inventions. If they start their own companies, they are free to retain all ownership interests. Thus, if the university has a policy of university ownership of faculty inventions, faculty's desire for ownership rights may be a prime motive for leaving the university for another university or for starting their own company.

2. Pattern of Business Employers

Universities also explain that a university policy of university ownership is consistent with what business employers do. Business employers execute their policy of employer ownership of employee inventions by having employees sign assignment agreements. These agreements are necessary since under Dubilier and other cases, employees own their inventions
unless they are hired to invent. Since universities typically do
not require that faculty expressly sign over assignments of their
inventions, universities presumably equate the university policy
statement to an assignment agreement.

While the American business practice of employee assignment
of inventions is widely applied, the wisdom of this business
policy is unclear. The practice has been criticized as unfair,
unbalanced, and anti-competitive. In addition, it is out of
sync with what businesses in other countries do. This
disparity in employment policy may put U.S. employers at a
disadvantage in what has become an increasingly global employee
workforce.

In addition, there are other particular reasons that
universities should not follow the pattern of business employers.
The traditional and fundamental nature and mission of
universities differs from that of business employers. Unlike
business, the university agenda is not making money;
universities' explicit goal is not the development and
commercialization of profitable products. Instead, the
universities' articulated mission is the generation and
dissemination of knowledge for the welfare of the university
community and society as a whole. Teaching and research
functions are done in pursuit of these goals.

University ownership of faculty inventions increases the
university's involvement in and commitment to entrepreneurial
activities. As subsequently discussed, this entrepreneurial
interest creates a conflict of interests for the university and
jeopardizes the university's academic mission.

Faculty also are different than employees in business.
Faculty are attracted to universities because they will receive
increased freedom, independence, and rights in their professional
activities. The university imposes fewer restrictions on how
they spend their time and how they use their creative talents.
For these reasons, faculty are willing to accept lower salaries
than they would obtain for comparable work in industry.
Faculty receive this professional discretion as part of the
benefits and consideration that the university offers them in
exchange for their employment.

3. Enforceability of University Policies

In addition, universities assume that their policies are
enforceable. Thus, even if as a matter of law faculty own their
inventions, universities still may enforce faculty's assignment
of their ownership rights to the university. In theory, this
contention is correct. Contract law generally will enforce
employees' express assignment of their ownership rights in
inventions to their employers.
In certain circumstances, however, where there is misrepresentation, inequality of bargaining positions, or overly broad terms, the courts will not enforce the assignment. In Roberts v. Sears Roebuck & Co., for instance, the court imposed on the employer a duty of fair dealing. These judicial precautions are predicated on the well-established principle endowing employees with the ownership of their inventions.

In addition, these assignments are narrowly interpreted. In Amoco Production Co. v. Lindley, for example, Amoco hired Ralph Lindley to do research related to geological exploration for oil and gas. He was working on projects to use well-log data more efficiently. Lindley devised a software system that was an outgrowth of the work he was doing and clearly of value to Amoco. His employment agreement provided that the employee would assign "all inventions." Noting that the term inventions is often used in the context of patent law and that some recent court opinions have denied patents to software, the court concluded that Lindley's software program was not subject to the assignment provisions.

In addition, some states have statutes that restrict the terms used in assignment of invention agreements. The purpose of these statutes is to protect employees against the employer's overreaching. Therefore, universities located in these jurisdictions would have to tailor their policies to comply with these statutes.

While some university policies are subject to statutory restrictions or may be criticized as overly broad, many universities have a more fundamental problem. Faculty could argue that they have not expressly assigned their inventions to the university at all.

The university ordinarily cannot argue there is written evidence of faculty's express assignment. The basic terms of faculty's particular employment are often written in correspondence, such as the departments' and university's letter officially offering faculty their positions. These letters contain general descriptions of their responsibilities, especially the classes that faculty might teach. They typically do not discuss research projects, since faculty's research agenda is considered their individual prerogative. Certainly they do not contain language specific enough to support a conclusion that faculty were hired to invent or that faculty agree to an assignment of their inventions. Even if there is language in the letters or the written documents from which to infer these conclusions, the language would be construed against the university since it wrote the documents.

University officials instead would have to argue that faculty have contractually acquiesced to the terms of the general university policy. The strength of this contractual
acquiescence argument is questionable. University policies typically are the creation of the university. They are not products of negotiation between prospective faculty members and university officials. At the time faculty are hired, they often are unaware that there is any policy on the assignment of their research results. Even if they are aware of the existence of a policy, it is unlikely they understand the significance of the university's claim to ownership to their inventions.

For instance, faculty probably are not aware that as a matter of law, they have the original ownership rights to their inventions. Furthermore, faculty are unfamiliar with the rights that are an inherent part of legal ownership: as owner, they would control who and how the invention is made, used, or sold. At the same time, universities have a vested interest in providing minimal information to faculty about their rights. Under these circumstances, faculty persuasively could argue that the basic contractual elements of a meeting of the minds and of mutual assent are absent.

Kaplan v. Corcoran, discussed earlier, is an instructive case. There the Veteran's Administration hospital based its claim to ownership of an employee invention on a contractual acquiescence argument. The employee was a medical doctor who had a variety of responsibilities including administration, teaching, and research. The hospital argued that the applicable government policy, providing that the hospital owned employee inventions, was published in the Federal Register of the Code of Federal Regulations. The doctor's acceptance and continuance of employment while the policy was in effect "signifies acquiescence" to the policy which "must be considered tantamount to an agreement of employment." Although the employee was not told about the policy when he was hired, the hospital argued that he had constructive notice.

The court not only rejected this theory of constructive notice, but went on to reject actual notice as the basis for an employee's contractual acquiescence to an assignment of ownership rights to the invention. It responded that "notice is an insufficient basis for the expropriation of a valuable property right such as this one in controversy here. The court finds this to be particularly true where there is a well-established principle relating to ownership rights that is directly contradictory to the general import of the notice provisions."

It is ironic that the university's strongest evidence of contractual acquiescence would be faculty's own conduct. Although not necessarily determinative, if faculty treat their inventions as if the university owns them, the courts may consider faculty's course of conduct as evidence of university ownership. The court presumably is merely fulfilling what it perceives to be the parties' expectations. For example, consider the consequences if faculty have in the past (1) assigned their
inventions, (2) allowed the university to pay expenses and devote time and skills to commercializing the invention that it would only reasonably do if it owned the invention, or (3) followed university disclosure and compliance procedures consistent with university policies providing for university ownership. Well-intentioned, but uninformed and naive, faculty may be deemed to have contractually acquiesced to a university policy that would not otherwise have been enforceable.

On the other hand, faculty's conduct also could be evidence that faculty have not acquiesced to university ownership. Namely, faculty could treat inventions as if they own them. Thus, faculty may not have assigned past inventions, the university may not have been involved in commercialization unless it was compensated for its assistance, and faculty may not have disclosed their inventions.

Further questions about the enforceability of university policies are raised if the university establishes its policy or tries to inform faculty about its policy after the beginning of the employment relationship. Considering that many universities have established or substantially revised their policies in recent years, these issues should be of widespread concern.

For example, discoveries "created" prior to the policy's existence would not be subject to the policy. Common law principles mandating faculty ownership presumably would govern. Uncertainty about when discoveries are "created" and thus subject to the policy further complicates the issue.

Even if the policy is deemed to apply to the contested inventions, the question of whether there is adequate consideration remains. Assuming there would have been adequate consideration for the forfeiture of faculty's ownership rights at the beginning of their employment relationship, faculty could argue that the consideration for such a forfeiture during an ongoing employment relationship is insufficient.

If the university attempts to enforce its policy after faculty leave the university, there will be other problems. The policy will be critically scrutinized since it imposes post-employment restrictions that may be analogized to non-competition clauses. In Ingersoll-Rand Co. v. Ciavatta, for instance, Rand Research Inc. tried to enforce a contract provision requiring a former employee, Armand Ciavatta, to assign his inventions during his employment and for one year after his employment. The provision stated that the holdover clause would be applicable only to (1) inventions conceived as a result of work done while employed and (2) inventions within the scope of the company's business. Both the trial and appellate courts analogized the provision to non-competition provisions, thus holding the provision to strict scrutiny and a reasonableness test.
The reasonableness test balances the legitimate interests of the employer, the hardship imposed on the employee, and the effects on competition. Applying this test, the appellate court concluded that the provision was unenforceable because it effectively left the fifty-year-old former engineer/manager/researcher unemployable in his area of expertise. The court rejected the employer's argument that the employee could find work in another field. Furthermore, since the post-employment provision would have the effect of "lessening competition and keeping potentially competitive products from the market," it was unreasonable.\textsuperscript{137}

These same arguments could be applied to the university setting. Faculty are attractive to other universities or the private sector because of their specific expertise and research results. If the university claims ownership and control of research results developed after faculty leave the university, the faculty's employment opportunities are greatly diminished. Furthermore, after faculty leave the university, they would be less inclined to continue research that results in inventions that their former employer would own and over which they would have no rights. Thus, some "potentially competitive products" would never be created.

In summary, universities need to reevaluate whether their university policies are enforceable. Faculty at many universities have not expressly agreed to and signed assignment agreements. Likewise, contractual acquiescence arguments are questionable. Furthermore, if universities attempt to enforce policies established after the faculty's employment begins or after the faculty leave the university, there are additional problems.

4. Government Regulations

Some university officials shift the responsibility for their policies to the federal government. They explain that even if they wanted ownership rights to remain with faculty inventors, government regulations would not allow it in research sponsored by the federal government. Since they posit that approximately 90\% of all research is government sponsored, they conclude that virtually all research is subject to this prohibition.

This explanation is faulty for two reasons. First, government regulations are not as restrictive as universities apparently believe. Second, even if government regulations did prohibit faculty ownership, the regulations would apply only to research sponsored by the federal government. Their extrapolation to all research is unjustified.
a. Bayh-Dole Act

The Patent and Trademark Law Amendment Act of 1980, more popularly known as the Bayh-Dole Act, is the law that university officials claim forces the university, rather than faculty inventors, to retain ownership. Prior to this law, there was no uniform government policy on the ownership rights between the sponsoring government agency and the university contractor receiving the funds.

The Bayh-Dole Act is intended to operate in the following way: the government agency sponsors research conducted by faculty, with the university acting as the contractor. If the faculty develops an invention arising from the research, faculty follow disclosure procedures outlined under the law. The university can then elect title to the invention and work with faculty to apply for a patent and to commercialize the invention. The government receives a nonexclusive, nontransferable, irrevocable, paid-up license (shop right) to the invention, and faculty receive a percentage of the royalties. The law applies to all federal agencies and virtually all funding agreements with universities.

The Bayh-Dole Act is not as restrictive about the ownership rights of faculty as the universities seem to believe. In fact, the law expressly recognizes the possibility of faculty ownership under the following circumstances. If the university does not elect to take title, the government may claim title. In practice, the government claims title infrequently, such as in cases where the invention supplements, parallels, or otherwise contributes to the research that the agency already is conducting or sponsoring. If the government does not claim title, the inventor faculty can petition the government agency for ownership. The agency normally grants these requests. The procedure gives title to the faculty only after both the university and the government reject it.

But can faculty retain title to the inventions from the outset without ever having to assign its interests to the university? While university administrators apparently believe that the answer is no, the regulations could be interpreted otherwise. While the law expressly requires faculty disclosure of certain subject inventions, there is no express requirement that faculty assign ownership.

The origin of the university's position apparently is found in the regulations providing the standard terms of government funding agreements between the government agency and the contractor. These regulations require that, among other terms, the funding agreement contain provisions describing "contractor action to protect government interest." Pursuant to these provisions, the contractor agrees (1) to have in order all
instruments necessary to confirm all of the government's rights in the invention; (2) to require that all employees, by written agreement, disclose the inventions subject to procedures described in the act; and (3) to execute all papers necessary to properly file patent applications and to "establish the government's rights in the subject inventions." The university believes that to comply with these regulations, it must own the inventions. For example, the university presumably reasons that one of the instruments necessary to confirm the government's rights is a university policy assuring university ownership.

However, as the labeling of the regulations makes clear, the intent of these regulations is to protect the government's rights and interests to the inventions. The government is not particularly concerned about whether the university or the faculty own the invention. The government is concerned that whoever owns the invention is clearly identified, and that the owner assures the government that the government's shop right, residual rights to ownership, and other derivative rights are protected.

The government's interest may be sufficiently protected, at least in theory, in various arrangements. One arrangement is what the university envisions: that the faculty assign their ownership rights to the university at the outset. The university then will be in the legal position to grant the government its shop right and other derivative rights.

In some cases, this arrangement ironically may not protect the government's interest. At many universities, the university's policy is considered the legal basis for faculty assignment of their ownership interests. Since that policy may not be enforceable, both the university's claim to title and the government's claim to their shop right and other derivative rights may be jeopardized.

An alternative arrangement that could protect the government's interest is for the faculty to remain the owner. To comply with the regulations, the university as the contractor must work with faculty to assure that the government's interest is protected. Basically the faculty, as owner, would execute the necessary documents granting the government its derivative rights. These would be the same type of papers the university would execute if it were owner, or as is sometimes the case, that the faculty would execute anyway if it were designated as the contractor. As this alternative arrangement illustrates, the university could comply with the regulations without owning the invention.

Even if the university is required to be the owner, the law contains no express prohibition against the university assigning its ownership rights to the inventor faculty member as it might to any other third party assignee. In fact, the law contemplates
the possibility of an assignment. While the government needs to approve any assignment, the government may not only approve but even encourage assignment to a faculty if it would help fulfill the law's objectives. 

In addition to not being as restrictive about faculty ownership rights, the Bayh-Dole Act is not as expansive as the university seems to believe. While the exact scope of the law is unclear, the express language suggests that the law is applicable only to inventions that are patentable. Therefore, the university would not be obligated to impose any restrictions regarding ownership or otherwise, to nonpatentable discoveries.

b. Federal Funding Exaggerated

Universities also posit that approximately 90% of all research is federally-funded. Thus, they continue, since virtually all research is already subject to government restrictions on ownership, all university research might as well be similarly restricted. As the following data substantiates, applying these restrictions to all research is unjustified.

The federal government is the largest source of research funding. However, the common perception that it constitutes approximately 90% of research funds is overstated. This figure even exaggerates the amount of funding during the heyday of federal funding. For instance, in 1969, when federal funding was at its highest, it accounted for only 72% of total research funds. Since that time, the percentage of federal funding has steadily decreased. In 1989, federal funding accounted for only 59% of research funding at all universities. The remaining 41% of research funding was provided by various sources, including institutional funds, industry, state and local governments, and other sources. For some research-related expenditures, non-federal sources even dominate. For example, non-federal sources accounted for 92% of all funds used for research-related capital expenditures in 1987.

The amount of federal funding also varies considerably from school to school. Among the twenty universities with the largest research expenditures, the amount of federal funding ranges from lows of 34% at Texas A&M University and 49% at the University of Minnesota to highs of 93% at Johns Hopkins University and 89% at Columbia University. Public and private universities also differ in their funding sources. In 1987, for instance, private institutions received more federal funding (74% of research funds) than public colleges (53% of research funds).

Carnegie-Mellon University and the University of Pittsburgh offer an example of contrasting profiles. The two schools, whose campuses are adjacent to one another, have similar total research expenditures of about $84 million dollars. The University of Pittsburgh, however, receives more government funding and
institutional funding than Carnegie-Mellon. In contrast, Carnegie-Mellon receives about two and one half times more in industry funding.\textsuperscript{164}

Not surprisingly, the amount of federal funding also differs substantially among disciplines. In 1987, federal dollars represented the following percent of total research funds in these disciplines: 33.9\% in the social sciences, 58.9\% in engineering, 59.1\% in the life sciences (including the medical sciences), and 75.5\% in the physical sciences.\textsuperscript{165}

Moreover, there is a great deal of faculty research that is not reflected in the accounting above. Most faculty conduct academic research as part of their ongoing general research activities. Their research is not part of a designated research project or funded by specific institutional grants. While the amount of this research cannot be measured, it is reasonable to assume that it would represent an additional substantial volume of research that is not federally-funded.

In summary, the data clearly substantiates that the amount of federal funding is not so great that rules which apply to federally funded research should apply, by default, to all university research. This is true for universities in general. It is particularly inappropriate to extrapolate federal restrictions to all research at schools and in disciplines where federal funding is not disproportionately represented.

5. Legal Principles

Universities typically do not base their claim of ownership on legal cases.\textsuperscript{166} Most likely, they have not researched the topic, presuming that their ownership is a foregone conclusion. The one case on point, Speck v. North Carolina Dairy Foundation,\textsuperscript{167} agrees with universities' presumption of ownership. Unfortunately for universities, the Speck case illustrates how one appellate court misinterpreted the explicit principles pronounced in Dubilier and confirmed in numerous cases. The court's conclusion in Speck is both legally inaccurate and alarming in its policy implications.\textsuperscript{168}

Dr. Marvin Speck was an esteemed named professor of food science and microbiology at the University of North Carolina.\textsuperscript{169} He assumed routine teaching and research responsibilities during his 20 years of university employment. His research interests were self-directed and self-motivated. He apparently had not signed an employment agreement. In these respects, Speck fits the profile of a typical university faculty member.

Between the 1960s and early 1970s, Speck and an associate, Dr. Stanley Gilland, conducted research on microorganisms used in food manufacturing, including a bacteria called lactobacillus acidophilus (acidophilus). Acidophilus is believed to aid human
digestion and offer other health benefits.\textsuperscript{170} Because of its health benefits, the bacteria has been added to milk (acidophilus milk). However, the process by which the bacteria is added, causes the milk to have an unpleasant sour flavor. After years of research and experimentation, Speck discovered a process by which the bacteria could be added to milk without producing the sour taste.\textsuperscript{171}

At the recommendation of his department head, Speck in 1972 contacted the university's Patent Committee. He proposed that the university, through a nonprofit university affiliated foundation called the Dairy Foundation, assist him in the legal protection and marketing of his secret process.\textsuperscript{172} In 1973, at the recommendation of the Patent Committee, the Foundation agreed to help commercialize the process. About a year later and with the Foundation's assistance, Miles Laboratory agreed to produce and G.P. Gundlick and Company agreed to market "sweet acidophilus" milk. In 1975, the university proudly announced and celebrated the development of this product.\textsuperscript{173}

In November 1975, Speck asked for a share of the royalties, noting that "participation by the inventor in the royalties [must have been] overlooked."\textsuperscript{174} The Patent Committee recommended that Speck be compensated.\textsuperscript{175} A university legal counselor also advised that Speck probably owned the invention since it was not patentable and hence not subject to the university's patent policy.\textsuperscript{176} Despite these suggestions, the university denied Speck any rights to his process. Speck and Gilland brought suit in December 1981. By that time, the royalties received by the university on Dr. Speck's invention were well over a half-million dollars.

The trial court held that the university had breached its duty to Speck,\textsuperscript{177} reasoning that Speck had entrusted in good faith his confidence and invention to the university for development.\textsuperscript{178} Speck believed the university had superior skill and experience and trusted their judgment. The court emphasized that Speck reasonably assumed that the patent policy would be applicable, even though everyone agreed the invention was not patentable. Under the terms of the patent policy and as consistent with past practice, the university claimed ownership rights and the inventors received a 15\% share of the royalties.\textsuperscript{180} Thus, even if Speck did assume the university was the owner,\textsuperscript{181} the assumption was coupled with his assumption that he would be compensated. The university never informed him that since he never assigned to it his ownership interests, the "ownership rights were his."\textsuperscript{182}

It is unclear why Speck's attorneys did not ask the trial court to resolve the dispute on the basis of the ownership issue. While the court stated that Speck owned the invention, neither it nor Speck's attorneys apparently reasoned that as owner, he was entitled to all of the royalties. For its efforts in the
commercialization of the invention, the university perhaps was entitled to some equitable compensation or shop right.

While the university could have argued that Speck had acquiesced to the university's ownership, such a contractual acquiescence argument would be subject to strict legal scrutiny. The courts require that employees understand and freely intend to assign their ownership to their employers. The facts here indicate that Speck and the university disagreed about their respective rights. Speck did not understand what his legal rights were; the parties were unclear about who owned what. Speck's position and deference to the university further suggests he had unequal bargaining power. The success of a contractual acquiescence argument here is doubtful.

The North Carolina Supreme Court on appeal, however, decided to premise its holding on the ownership issue. It reasoned that if Speck never had any ownership interest in his invention, then the university never owed him a fiduciary duty. Given the facts and the applicable legal principles, the result would seem predictable: Speck should own the process. However, contrary to the Dubilier legal principles, the supreme court used result-oriented circular reasoning, concluding that if Speck created an invention, then he must have been hired to invent. "The fruit of the labor of one who is hired to invent, accomplish a prescribed result, or aid in the development of products belongs to the employer absent a written contract to assign."

The state's supreme court bases its surprising conclusion of university ownership on these facts: Speck was employed as a teacher and researcher and he used university resources and time to develop his invention. As Dubilier and a string of other cases confirm, these facts do not justify university ownership. Further, there was no evidence that Speck's research was ever directed or controlled—rather it was voluntarily assumed, motivated by his scientific curiosity and his hopes of discovering something societally useful. This lack of research directives supports a conclusion that he was not hired to invent.

The court's misunderstanding of the applicable legal principles is highlighted in its statement, "under these facts, the secret process developed through the research of the [faculty] belong to the university absent a written contract by the university to assign." As Dubilier explicitly states, legal principles dictate the opposite presumption: the process belongs to the faculty absent a written agreement by the faculty to assign. Instead of exercising judicial restraint in preempting the inventor's ownership rights, as the Dubilier court counsels, the court here exhibited judicial hastiness.

In addition to being legally inaccurate, the North Carolina Supreme Court's conclusion is alarming because of the policy signals it sends. If a typical faculty member is "hired to
invent," as the court concludes, he or she is characterized as employees who are hired to pursue specific research from which they should produce specific inventions.192 This mandate to conduct designated applied research conflicts with the fundamental principles of academic freedom.

While research is an important factor in the hiring, tenure, and promotion decisions, faculty are not required to research a specific subject or to produce any particular work product. Instead, the university's expectation is that faculties' research is significant in their discipline and that their work products are well-regarded by their professional peers. Faculty expectations are that their research topic and objectives are predicated on their personal and professional interests; they are not dictated by university administration.

The Speck case also discourages faculty from working with their universities in developing their inventions, at least if, as in this case, the university's self-interest exceeds their interest in maintaining faculty goodwill.193 Speck was a committed, productive, long-term faculty member. He based his conduct on what he thought was university policy and protocol. He deferred to what he considered to be the university's superior knowledge, judgment, and skill. In good faith, he disclosed his invention and fully cooperated with the university in commercializing it.

His naivete and good faith towards the university hurt him.194 Since his invention was not patentable, he was not required to disclose it to the university— but he did. His cooperation with the sweet acidophilus milk producer in the early product development stages was essential. He could have withheld it until the university acknowledged his ownership and had negotiated what he considered fair terms for the university's exploitation of it. Yet, as requested by the university, he cooperated fully under the mistaken assumption that the university would treat him fairly.

Finally, the case highlights the arbitrariness of classifying faculty discoveries and the inequities that flow from these classifications. At the time of Speck's inventions, the university had a policy governing only patentable inventions.194 If Speck's process had been deemed patentable, presumably the respective rights of the parties would have been clear.

Since his process was not patentable, three alternatives emerged. First, his process could have been analogized to patentable discoveries. If so, the policy terms would apply and Speck should have received royalties. Although the university Patent Committee recommended this alternative, the university rejected it.195 Second, since there was no policy governing his discovery and no other agreement between Speck and the university, Speck would retain all ownership rights. Although a
university legal advisor presumed this was the result, the university also rejected it. Third, the university owns the process and Speck gets nothing. Although this alternative was contrary to established legal principles and notions of fairness, the university opted for it.

In part, the university was following the categorization system existing under intellectual property law. Under intellectual property law, an individual's creative efforts are classified according to the kind of legal protection that creative effort may receive. Once that classification is determined, certain legal rules on ownership and the exclusive rights of owners apply. Thus, if faculty research results are patentable, then certain rules are applicable. If the results are copyrightable or trade secrets, then other rules are applicable.

Although these laws determine original ownership rights, the original owner can agree to assign some or all of the rights. University policies presumably constitute such an agreement. Thus, the university and faculty can develop policies that do not adhere to the categorization system provided under intellectual property laws. For example, Harvard University has classified faculty research into two groups: (1) any discovery the faculty member believes is "useful, patentable, or otherwise protectable...even if not patentable" (inventions), and (2) work that is copyrightable. It further divides the first group into inventions that are related to public health and those that are not. Stanford University, in addition to other categories, includes one for "tangible research property," defined as "tangible (or corporeal) items produced in the course of research projects supported by Stanford or by external sponsors" (TRP). TRP includes computer software. University treatment of faculty research is dependent on the classification to which the research belongs.

Universities should structure a policy that is meaningful to the university community, even if it does not mirror the categorization system provided under intellectual property laws. Thus, a system based on the research's contribution to the academic community or the public good, such as Harvard's, makes more sense than a system based on how marketable the invention is.

6. Summary

Universities base their claim of university ownership of faculty inventions on various rationales. When carefully analyzed, these rationales are questionable. Universities explain that they are merely following the lead of other universities and business employers. Perpetuation of a common practice, especially when that practice is inappropriate, is an inadequate justification. Universities explain that their
policies provide for university ownership. Given the circumstances under which these policies were created and most faculty's lack of knowledge and understanding of these policies, the enforceability of many of these policies is in doubt. Universities explain that federal law and case law support their claim to ownership. However, federal law does not necessarily require university ownership. Even if it did, restrictions imposed on federally-funded research need not apply to all research. In addition, general legal principles do not endow the university with ownership as a matter of law. The only case that reaches this conclusion is faulty.
IV. Policy Arguments for Faculty Ownership

If university policies that claim university ownership of faculty inventions are not required by law and are not otherwise justified, what should the respective ownership rights of faculty and universities be? As the landmark cases recognize, faculty ownership serves significant societal goals. At the same time, university ownership threatens the university's academic mission.

A. University Ownership Conflicts with the University's Academic Mission

The university's ownership of faculty inventions jeopardizes the university's proper academic mission:

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. . . . Academic freedom is essential to these purposes and applies to both teaching and research. Freedom in research is fundamental to the advancement of truth.

Thus, if the university owns faculty inventions, it faces a dilemma. It is the protector of the faculty's academic freedom, and as such, would not want to intervene in faculty's research interests. As the owner of faculty inventions and a prime beneficiary of any income arising from inventions, the university sees the opportunity to create sources of funds for institutional support. If the research is sponsored, the university may feel pressure to serve the sponsor's needs even though they may conflict with the faculty's priorities. In addition, the university may feel an obligation to make publicly available those inventions with potential public benefit.

Given these interests, universities naturally would encourage faculty to pursue applied research that might ultimately result in practical products. After the inventions are reduced to practice, the university might then pressure faculty to devote whatever time is necessary for the invention's successful commercialization.

Examples of these kinds of institutional pressures have surfaced in disciplines where sponsored research is prevalent. There the universities encourage faculty to structure their research interests to fit the agenda of sponsoring entities. While institutional "encouragement" may be subtle, it also may take the form of the granting or denial of promotions, tenure, or salary increases. These kinds of pressures are infringements on the faculty's academic freedom. They undermine the
faculty's right to choose, free from institutional pressures, what shape their research takes and how their research results will be used.

Furthermore, the university's role is to provide faculty with the work environment and resources necessary for faculty to be productive and creative. If the university becomes coercive, adversarial, or competitive, this greatly harms the creative environment. University ownership of faculty inventions increases the probability of these antagonistic relationships. Faculty and the university would control different parts of the invention process. As the inventor, faculty control the creative process; as the owner of the invention, the university would control the exploitation of the faculty's creativity. Both the university and faculty would compete for the benefits, such as royalty and reputation, of the invention's exploitation. Faculty priorities for the exploitation process, such as assuring that the commercial product is faithful to the research prototype's quality standards, may conflict with the university's desire for more expedient commercialization. At the same time, the university may have preferences for the creative process, such as practical-oriented research topics, that may conflict with the faculty's research agenda.

1. Basic Research is Jeopardized

Consistent with the university's goal of creating knowledge, university researchers have historically emphasized basic research over applied research. In 1989, for instance, of the approximate $18.6 billion of basic research performed in the United States, a majority of that research was done in academia. In contrast, of the approximate $27.3 billion of applied research, only about 13% was performed by universities.

To the extent that universities encourage faculty to conduct applied research and shift significant resources in that direction, universities will start to resemble the many other applied research enterprises in the business and government sectors. While this redirecting of academic talent might contribute to a national effort to increase applied research activity, the university would be abandoning its unique role as the bastion for basic research. At the same time, industry because of its profit orientation and government because of its public service orientation, would have little incentive to fill the void.

Basic research is directed at answering an intellectual inquiry rather than research intended to produce results with a practical application. It has produced landmark breakthroughs that have yielded highly significant societal benefits. Since basic research often lays the foundation for more applied research, a decrease in current basic research could jeopardize the success of future applied research efforts. If the
university is diverted from their emphasis on basic research, the societal cost is immeasurable.

Not only do universities perform the majority of basic research in the country, but not surprisingly, there is more basic research performed at universities than any other kind of research. In 1989, for example, of the approximate $13.9 billion of total academic research, basic research constituted 68%. Applied research accounted for 25% and development research accounted for 6%. Thus, a marked shift toward applied research in academia would reshape the university's agenda and taint an environment that emphasizes basic research.

2. University's Entrepreneurial Involvement Increases

University ownership of faculty inventions will increase the universities' entrepreneurial activities. Already universities are acting as venture capitalists and equity holders of sizeable start-up ventures. Thus, universities are becoming more vulnerable to the economic risks that entrepreneurs face. This could jeopardize the financial health necessary to carry out their basic academic mission. In addition, speculative entrepreneurial activities raise important corporate, tax, and tort liability problems. As they anticipate and face these complicated risks, it is inevitable that universities will be diverted from their academic mission.

An example illustrates. A university may enter a joint venture with a medium-sized biotechnology company, where the university carries out the research and development function for certain potential product lines for the company. Once the product reaches the market, however, there may be product liability suits against the manufacturer. Because the university is clearly in the stream of production, the university also may be sued. The university may be an especially likely defendant if the manufacturer has inadequate assets to satisfy what could be a multi-million dollar injury claim. The university, with its millions in endowments, is viewed as the deep pocket.

The university could try to protect itself against products liability responsibility. The company could agree to indemnify the university, but it is unclear whether it would be willing to do so since the original research and development is from the university and the company has no control over it. Even if it did agree to indemnify, it would be uncertain whether it could fulfill its obligation considering its limited resources. The university also could purchase its own insurance or indemnification policies, although that would be expensive.

In the alternative, the university could conduct its entrepreneurial activities through a separate corporation or foundation, on the theory that university assets would be insulated. There is the possibility, however, that the plaintiff
might be able to pierce the corporate veil of the separate corporation or foundation. This would be especially likely if the entity is really just the "alter-ego" of the university.

Thus, what began as a promising entrepreneurial activity for the university could evolve into a complicated problem that threatens to jeopardize the university's devotion to its academic mission. The university would have to focus significant amounts of time and money to anticipate and strategize against liability, and if necessary, to defend against a products liability suit. If the plaintiff reaches university assets, the impact on the university could be disastrous.

B. Faculty Ownership Enhances Faculty Creativity

As the prior discussion explains, university ownership may jeopardize the university's proper academic role. At the same time, faculty ownership enhances faculty's proper role as creative and productive researchers.

Research is both the conduit and manifestation of one's intellectual energy—the very asset upon which faculty build their professional identity and reputation. Research and other creative activities, however, cannot be coerced. Faculty must be motivated to explore novel ways of viewing the basic laws of nature and society. The premise of the common law and intellectual property law is true: faculty are more likely to be inventive if they own their research results. As owners, they have ultimate control over how their research evolves, in what ways it is used, and how they can access and exploit it.

For example, faculty may have an interest in commercializing their work for a particular industry. Or faculty may be altruistically motivated. They may feel strongly that their creative work should be promptly, publicly, and freely available for professional and societal benefit. Only faculty ownership assures faculty of complete freedom to utilize their talents and work in whatever way they want. As owner, the university may have different priorities.

Furthermore, faculty inventors who own their inventions are in the best possible position to ensure the invention's proper development from an abstract idea to its practical application. As the inventors and technical experts, they best understand the fundamental nature as well as the intricate nuances of the discovery. They can protect the integrity of the invention and help solve problems as it moves from research prototypes through commercial modifications to the market. As owners, they have an economic and professional interest in the outcome, as well as ultimate control over questions dealing with product evolution, licensing, and distribution. Not only the creators' interests, but also the public's interest in the highest quality, most accessible, and creative products are best served if creators own
their own works.²¹⁷
V. Conclusion

Faculty-generated inventions can be very valuable. They may be valuable to faculty inventors because of the personal commitments they required and the professional contributions they represent. They also may be valuable to both the faculty and the university if they can be commercialized into profitable products. Moreover, faculty-generated research and inventions have yielded enormous societal benefits.

The value of these inventions underscores the importance of a fundamental issue: who owns the golden eggs? As a matter of common law, faculty own their inventions. Many university policies, however, presume that the university owns the inventions. As this article discusses, the university's rationales are questionable. In some cases, it is unclear if the university policies are even enforceable. Moreover, university ownership may well conflict with the university's academic mission. At the same time, faculty ownership enhances the faculty's creative productivity.

These legal and policy considerations compel universities and faculty to rethink their respective positions. It is ironic that universities have overlooked the rights of faculty since faculty are the "source," the proverbial geese from which all possible wealth is generated.218 Rather than denigrating faculty interests, one instead would expect that university administrators would be actively garnering faculty goodwill.

To begin, universities should recognize that faculty have original ownership rights as a matter of law. An express statement of the law in university policies would help to properly inform the university, faculty, and other interested parties, such as sponsors or users of faculty research. This notice is necessary since these parties often appear to mistakenly assume that the university has original ownership rights.

A likely consequence of this recognition will be a clarification and realignment of the parties' roles and interests. Universities will affirm the primacy of their traditional academic mission. Faculty will be motivated toward increased creativity and productivity. Faculty or their representatives will be integrally involved in negotiating how, if at all, their research will be developed and commercialized. In addition, both funding entities and users of inventions, such as licensees, will be more responsive to faculty priorities and preferences.

Universities, however, need not view their participation in the development of faculty research as all or nothing. Faculty ownership does not necessarily mean that the university is uninvolved in the inventive or commercialization process.
Faculty should recognize that there are a range of supportive and consultative roles that universities can play. Properly structured, these roles can be compatible with the university's academic mission, yet yield benefits for faculty, universities, and society.
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The author also was able to obtain much useful information about the university perspective from two conferences held at the University of Pittsburgh: The Conference on Performance Assessment of Technology Transfer Programs, May 17 & 18, 1990, Center for Biotechnology and Bioengineering; and The Conference on Managing and Marketing of University Technology, May 31, 1989 [hereinafter "Pittsburgh Conferences"]. These conferences gathered together university administrators from a wide range of universities with responsibility for their institutions' development of faculty-generated research.

2. E.g., Bylinksy, America's Hot Young Scientists, FORTUNE, Oct. 8, 1990, at 56 (describing significant scientific discoveries of especially promising university researchers in these and other fields); Rule, Biotechnology: Big Money Comes To the University, DISSENT 430 (Fall 1988).

3. R. LEVY, INVENTING AND PATENTING SOURCEBOOK xxii, 119-49 (1990) (listing 390 university research parks, technology transfer programs, invention evaluation centers, and patent and trademark offices). For ongoing developments in the transfer of technology from university research to the private sector, see TECHNOLOGY ACCESS REPORT, a newsletter on the subject.


The author also recognizes Lewis Popper, who helped identify the faculty's and universities' potential conflicts of interests in the author's corporate law seminar.

5. There are various studies on what motivates faculty to conduct applied research. E.g., Louis, Blumenthal, Gluck & Stoto, Entrepreneurs in Academe: An Exploration of Behaviors Among Life Scientists, 34 AD. SCI. Q. 110 (1989) (describing what motivates entrepreneurship); Emmert & Crow, The Cooperative University Research Laboratory: Policy Implications for Higher Education, 16 J. HIGHER EDUC. 408 (July/Aug. 1989) (studying whether cooperative industry and university labs are more likely to produce commercializable inventions); Rahm, Bozeman & Crow, Domestic Technology Transfer and Competitiveness: An Empirical Assessment of University and Governmental R&D Laboratories, PUB. AD. REV., Nov.-Dec. 1988, at 969 (studying what motivates technology transfer in government versus university research settings); Bird & Allen, Faculty Entrepreneurship in Research University Environments, 60 J. HIGHER EDUC. 583 (1989).

6. While the term "inventions" is sometimes used only in connection with patent law, this article uses the term more generically to include faculty research results and work products that are not necessarily patentable. Copyrightable works, however, are not intended to be included. The author recognizes that copyrightable work products are subject to particular laws and have received different treatment than other faculty work products. See further discussion at note 66.

7. Others have noted the potential for ownership disputes between the university and the faculty inventor, given the common law presumption of employee ownership. Gilliland, supra note 3. More typically, commentators discuss the potential for ownership disputes between the university and sponsors of the research.


9. See discussion accompanying notes 49-199.

10. See discussion accompanying notes 200-217.

12. While the Dubilier facts deal with an invention that is patentable, the Dubilier principles have been applied to non-patentable employee discoveries cases. Also see Note, Patent Ownership: An Employer's Rights to His Employee's Invention, 58 NOTRE DAME L. REV. 863 (1982-83) (describing Dubilier and other cases).

13. Dubilier, 289 U.S. at 182-83; id. at 209-10 (dissenting opinion).

14. Id. at 183.

15. Id. at 184.

16. Id. at 185. The inventions were actually of the type on which another group on radio reception in their section was working.

17. Id. at 185, 196.

18. As described in Justice Stone's dissent, id. at 215:

[M]embers of the research staff were expected and encouraged to follow their own scientific impulses in pursuing their research and discoveries to the point of useful application, whether they involved invention or not, and even though they did not relate to the immediate problem in hand . . . . It seems clear that in thus exercising their inventive powers in the pursuit of ideas reaching beyond their specific assignments, the inventors were discharging the duties expected of scientists employed in the laboratory; Dunmore as well as his supervisors, testified that such was their conception of the nature of the work. The conclusion is irresistible but their scientific curiosity was precisely what gave the inventors value as research workers; the government employed it and gave it free reign in performing the broad duty of the bureau of advancing the radio art by discovering an invention.


20. Id. at 193.

21. Cases holding that the employee was hired to invent include Standard Parts Co. v. Peck, 264 U.S. 52 (1924); Solomons v. United States, 137 U.S. 342 (1893); Houghton v. United States, 23 F.2d 386, 390 (4th Cir.), cert. denied, 277 U.S. 592 (1928);

22. There is an alternative theory for concluding that the employer owns employee inventions. If employees are fiduciaries or the alter-egos of the employer enterprise, that status may impose a legal duty on employees to assign their ownership. Dowse v. Federal Rubber Co., 254 F. 308 (N.D. Ill. 1918); Kennedy v. Wright, 676 F. Supp. (C.D. Ill. 1988); Great Lakes Press Corp. v. Froom, 695 F. Supp. 1440 (W.D.N.Y. 1987); Melin v. United States, 478 F.2d 1210 (Ct. Cl. 1973) (rejecting claim that employee is alter-ego although he was a fiduciary); Tripp v. United States, 406 F.2d 1066 (Ct. Cl. 1969). The rationale is that persons in those positions of trust and confidence owe an undivided loyalty to their enterprise such that it would be inequitable for them to claim personal ownership. Great Lakes, 1446. This theory is rarely applicable to the faculty/university relationship since the typical faculty member is not a fiduciary or the alter-ego of the university. There may be atypical circumstances, however, when this theory may be plausible. An example might be a president of a small college who is closely identified with the school.

23. See discussion accompanying notes 123-25.


25. Note, supra note 12, at 866, n.15 (citing cases); M. EPSTEIN, MODERN INTELLECTUAL PROPERTY, ch. 13, 22-25, n.1, Ownership of Employee Inventions 499 (2d ed. 1989). Even though employees were not hired to invent at the outset of the relationship, their job may change so that they later may be deemed to be hired to invent. Their status at the time of the invention determines their rights. Houghton v. United States, 23 F.2d 386, 390 (4th Cir.), cert. denied, 277 U.S. 592 (1928).

26. There are other cases dealing with universities, but not dealing with this specific issue or these specific parties. Cases involving university or university employee over rights to employee inventions and work products include Dinwiddie v. St. Louis and O'Fallon Coal Co., 64 F.2d 303 (4th Cir. 1933) (dispute between engineering faculty who also started his own company and...
the corporate sponsor over ownership of invention); Mead Corp. v. United States, 490 F. Supp. 405 (D.C. 1980) (dispute between user/licensee, government licensor, and patent owner in patent infringement case over invention of university research associate); Powell Mfg. Co. v. Long Mfg. Co., 319 F. Supp. 24, 28 (E.D.N.C. 1970) (dispute between two assignees who claim infringement by a third company of faculty invention; validity of patent); Vitamin Technologist v. Wisconsin Alumni Research Found., 146 F.2d 941 (9th Cir. 1945) (dispute between university as assignee of faculty invention and company that allegedly infringed patent); Simmons v. California Inst. of Technology, 209 P.2d 581 (Ca. 1949) (university imposed restrictions on graduate student/inventor's rights of ownership not enforceable); Williams v. Weisser, 78 Cal. Rptr. 542 (Cal. Ct. App. 1969) (faculty, not university, owns copyright to university lecture notes); Weinstein v. University of Illinois, 811 F.2d 1091 (7th Cir. 1987) (faculty article is not work for hire); Regents of the Univ. of Colorado v. K.D.I. Precision Prod. Inc., 578 F.2d 1264 (10th Cir. 1973) (dispute between university and corporate sponsor over ownership of equipment associated with research); Mine Safety Appliances Co. v. United States, 364 F.2d 385 (Ct. Cl. 1966) (dispute between government sponsor and university on shop rights issue); State v. Neill, 12 So. 2d 590 (Fla. 1943) (dispute between state and researcher on question of ownership).


Cases where there is sponsored research include Aetna-Standard Eng'g Co. v. Rowlan, 343 Pa. Super. 64, 493 A.2d 1375 (1985) (private sector company with corporate sponsor); Dinwiddie v. St. Louis and O'Fallon Coal Co., 64 F.2d 303 (4th Cir. 1933); Mead Corp. v. United States, 490 F. Supp. 405 (D.C. 1980) (faculty research sponsored by the Department of Defense); Mine Safety Appliances Co. v. United States, 364 F.2d 385 (Ct. Cl. 1966).

28. Common law principles governing government employees and non-government employees are the same. Burns v. Massachusetts Inst. of Technology, 394 F.2d (1st Cir. 1968); United States v. Dubilier Condenser Corp., 289 U.S. 178 (1933). Others agree that Dubilier is applicable to faculty. E.g., Gilliland, supra note 3, at 980-81.

If faculty are hired to invent, the university employer is certainly benevolent and patient since the vast majority of research does not yield any inventions.


30. The Kaplan case, id., dealt with three related issues. The first was the ownership issue under common law discussed above. The second issue was whether the government regulation describing the ownership policy of employee inventions was applicable to Kaplan's situation and, if so, whether Kaplan violated it. The trial court concluded that the regulations were applicable and that Kaplan violated its terms. The third issue was whether the government regulation was constitutional. The trial court concluded that the regulation was not constitutional, but the appellate court reversed. The appellate court expressly declined an opinion on the merits of the claims applicable to the common law ownership issue.

31. The hospital also argued that Kaplan acquiesced to the hospital's ownership of the invention. Kaplan, 409 F. Supp. at 200-01. That argument, also rejected by the court, is subsequently discussed at text accompanying notes 123-25.


33. See Standard Parts Co. v. Peck, 264 U.S. 52 (1924) for example of the kind of specificity required. In Standard Parts, the employee was expressly hired to invent a specific process and the employee was known as an inventor.

See Weinstein v. University of Illinois, 811 F.2d 1091 (7th Cir. 1987), a copyright case reasoning that since all faculty are required to publish, then writing publications could not be a specific assignment. Extrapolating the Weinstein reasoning, one
could argue that since faculty are all expected to do research, then research could not be a specific assignment. Also see De Jur-Amsco Corp. v. Fogle, 233 F.2d 141 (3d Cir. 1956); Aetna-Standard Eng'g Co. v. Rowlan, 343 Pa. Super. 64, 493 A.2d 1381 (1985).

34. Dubilier, 289 U.S. at 188 (employee who is hired to engage in activities such as improving or researching that might eventually lead to invention Y is not expressly hired to invent invention Y) but Justice Stone in dissent indicates that employment contemplates invention and inventions were intimately related to purposes of scientific work. Id. at 200-10. Also see Francklyn v. Guilford Packing Co., 695 F.2d 1158 (9th Cir. 1983); Melin v. United States, 478 F.2d 1210 (Ct. Cl. 1973).

35. Dubilier, 289 U.S. at 188.


38. Dubilier, 289 U.S. 178, offered illustration of an employee in a government agency that furnished anchors to the Navy. The employee, a Navy lieutenant, was not hired to invent because he was not specifically directed to do so. The fact that he invented an anchor, which was the specific product of his employment, was insufficient for giving the employer the invention. Also see Ushakoff v. United States, 327 F.2d 669 (Ct. Cl. 1964).

39. E.g., in State Bd. of Educ. v. Bourne, 7 So. 2d 838 (Fla. 1942) a staff member of a research project of the Florida agricultural agency was assigned to a project developing new varieties of sugar cane. He subsequently discovered and patented in his name three new varieties of sugar cane. The court concluded that the employee owned the patents even though the inventions were made during his employment and were in the same general area as the research problems to which he was assigned. They reasoned that the employee owns inventions unless the employee was hired to invent the very specific thing invented. Contrast with State v. Neill, 12 So. 2d 590 (Fla. 1943).

40. See discussion of university policies claiming ownership on this basis, text accompanying infra notes 68-73.

41. Dubilier, 289 U.S. 178, 185; Melin v. United States, 478 F.2d 1210 (Ct. Cl. 1973); Solomons v. United States, 137 U.S. 342 (1893); Marshall v. Colgate-Palmolive-PEet Co., 175 F.2d 215 (3d Cir. 1949). While it is clear that the employees' use of employer resources is an insufficient basis for claiming employer ownership, it is unclear if the use of resources or any other
facts are a necessary predicate for employer ownership. For example, the Dubilier court expressly considered and rejected these rules: that the employer could claim ownership even if no employer resources and time were used, the invention is in a different field, the invention is in the same general field but not in the same specific specialty or only if the employer's organization is devoted to scientific research. These factors should be relevant only to the extent they are evidence of whether the employee was hired to invent.

42. Simmons v. California Inst. of Technology, 209 P.2d 581 (Cal. 1949) (graduate student at Cal. Tech); State Bd. of Educ. v. Bourne, 7 So. 2d 838 (Fla. 1942) (Florida agricultural agency); Ushakoff v. United States, 327 F.2d 669 (Ct. Cl. 1964) (industry); Dubilier, 289 U.S. 178.

Thus, the university's expenditure of time, effort, and funds targeted specifically to help commercialize an invention would not be a sufficient basis for claiming ownership. However, it may be used as part of a course of conduct argument supporting the faculty's contractual acquiescence. See discussion accompanying notes 126-30.

43. If the faculty's research is not successful, then that is the risk the parties have accepted. The faculty with their professional careers at stake, are more regretful about their lack of success than is the university. If the faculty's research is successful, perhaps even wildly so, then that is a windfall that the parties hoped for but were not guaranteed.

In addition, the university reaps significant rewards when a faculty member's research gains professional and societal attention and accolades. For example, intangible rewards are enhancement of its academic reputation, tangible rewards are enhancement of its student recruitment efforts and its fund-raising campaigns. Under these circumstances, the university may reevaluate the employment relationship and increase the faculty's salary and/or status. Likewise, if research does not meet university standards, the university may end the untenured faculty's employment.

44. Dubilier, 289 U.S. at 188:

During his hours employment, working with his masters, materials and appliances, conceives and perfects an invention through which he obtains a patent, he must accord his master a nonexclusive right to practice the invention. [Cites omitted.] This is an application of equitable principles. Since a servant uses his master's time, facilities and materials to attain a concrete result, the latter is in equity entitled to use that which embodies
his own property and to duplicate it as often as he may find occasion to employ similar appliances in his business. But the employer in such a case has no equity to demand a conveyance of the invention, which is the original conception of the employee alone, in which the employer had no part. This remains the property of him who conceived it, together with the right conferred by the patent, to exclude all others and the employer from the accruing benefits. These principles are settled as respects private employment.

Also see Solomons v. United States, 137 U.S. 342 (1893); McClurg v. Kingland, 42 U.S. 202 (1843). The shop right has been discussed in a number of different settings. Mech Metals Corp. v. Telex Computer Prod. Inc., 709 F.2d 1287, 1293 (9th Cir. 1983) (shop right is especially appropriate when the employer has "a liberal, informal attitude toward experimentation;" employee's reimbursement results in employer loosing shop right); Mine Safety Appliances Co. v. United States, 364 F.2d 385 (Ct. Cl. 1966) (government sponsor); Moore v. American Barmag Corp., 710 F. Supp. 1050 (W.D.N.C. 1989) (employee consent is key to shop right; the use of employer's resources is only evidence of the employee's consent); Simmons v. California Inst. of Technology, 209 P.2d 581 (Cal. 1949) (shop right passes to successor's corporation); Mainland Indus. v. Timberland Mach., 649 P.2d 613, 618 (Or. Ct. App. 1983), cert. denied, 460 U.S. 1051 (1983) (theory that employee should have shop right is rejected by the court). Also see Note, supra note 12, 872-75.

45. Id.


47. One can envision exceptional circumstances that would alter this conclusion. For example, a conclusion that a faculty member is hired to invent seems more probable if he or she is assigned to be a full-time researcher on a specific project whose stated purpose is to solve a particular problem through the invention of a process or a product. On the other hand, the conclusion that the faculty member is not hired to invent is further strengthened if research is an insignificant or nonexistent part of the faculty's responsibilities. E.g., Ingersoll-Rand v. Ciavatta, 542 A.2d 879 (N.J. 1988) (employee was not directed into an R&D department).

A written employment agreement also may be used as evidence that an employee was hired to invent. De Jur-Amsco Corp. v. Fogle, 233 F.2d 141 (3d Cir. 1956). However, faculty rarely have formal employment agreements. Gilliland, supra note 3, at 971,
981 (indicating that university R&D contracts usually are not specific enough to meet the Dubilier requirements).


50. Expansive legal protections on all kinds of research results also prompted university interest in entrepreneurship. Reichman, supra note 3, at 668. E.g., Diamond v. Chakrabarty, 447 U.S. 303 (1980) prompted the commercialization of biotechnology, including university generated discoveries. The case held that live, human-made micro-organisms are patentable. Also see M. OLIVAS, supra note 3.


53. See discussion accompanying notes 158-60 and note 164. Despite all the fanfare about increased industry funding, it is interesting to note that the percentage of industry funding in 1987 (6.4%) was about the same as the percentage of industry funding in 1960 (6.2%). After 1960, industry funding fell to below 3% between 1965 and 1973, and then began a gradual increase. Industry funding, therefore, is a re-emerging trend, not a new phenomenon. NATIONAL SCIENCE BOARD, infra note 61, at 297.

54. Ditzel, supra note 3, at 8-23.

55. Id.

56. Wisconsin Alumni Research Foundation (WARF), THE WISCONSIN ALUMNI RESEARCH FOUNDATION STORY 19 (1990) [hereinafter WARF]. Nine patents produce about 93% of this income. Id.

57. E.g., of 2,751 discoveries disclosed by University of Wisconsin faculty, only 73 have produced income greater than expenses. WARF, supra note 56.

58. Some examples of the "really big ones" are Professor Steenbock's discovery of a process to activate Vitamin D while at the University of Wisconsin. In addition, research at Indiana
University resulted in the discovery of the stannous fluoride used in toothpaste and research at University of Florida resulted in the Gatorade drink. D. DICKSON, supra note 49, at 90. Also see Vitamin Technologists v. Wisconsin Alumni Research Found., 146 F. 2d 941 (9th Cir. 1944) (describing vitamin D discovery in the context of litigation on the validity of the patents).


60. For a discussion of various ways to structure the university and faculty relationship, see infra note 220.


These schools are listed in descending order, beginning with the school with the largest research and development
expenditures. All the University of California schools have the same policy. The author received these policies in November, 1990.

Other miscellaneous policies also were reviewed, including those from Carnegie-Mellon University, Intellectual Property Policy [hereinafter "CMU Policy"]; University of Pittsburgh, University Patent Committee Policy and Procedures, University Policy on Patents [hereinafter "Pittsburgh Policy"]; Duke University, Policy on Inventions, Patents and Technology Transfer [hereinafter "Duke Policy"]; University of North Carolina--Chapel Hill, Patent and Copyright Policies [hereinafter "North Carolina Policy"]; North Carolina State University, Patent and Copyright Procedures [hereinafter "North Carolina State Policy"]; University of Rochester, Policy on Intellectual Property and Technology Transfer [hereinafter "Rochester Policy"]; and University of Utah, Inventions and Technology Transfer [hereinafter "Utah Policy"]. The author is indebted to Gary Meyer of the Indianapolis Center for Advanced Research, Inc. for providing a number of policies.


63. One impetus for developing a comprehensive intellectual property policy may be state laws. *E.g.*, Texas requires that each institution of higher education have an intellectual property policy that provides, among other matters, a "clear identification of ownership and licensing responsibilities" for "inventions, discoveries, trade secrets, and computer software." TEX. EDUC. CODE ANN. § 51.680 (Vernon Supp. 1987).

64. *E.g.*, Minnesota Policy, *supra* note 61 (policy covers "inventions, discoveries, apparatus, devices, processes, computer hardware, computer software, plants, organisms, genetic material, etc., . . ."); Harvard Policy, *supra* note 61 (policy covers any discovery that the inventor believes "might be useful, patentable, or otherwise protectable . . .").


66. University policies traditionally have allowed faculty to retain ownership of work that is copyrightable. It is unclear why universities allow faculty ownership of copyrightable work, but do not allow faculty ownership of other faculty work. The University of Washington, for example, explains that faculty may copyright their own work because the University "encourages the publication of scholarly works as an inherent part of its educational mission." Washington Policy, *supra* note 61. It would seem that faculty research results, even though not in the form of copyrightable work, also are integral to the university's educational mission.
The question of who owns faculty's copyrightable work as a matter of law currently is unanswered. While copyright law vests ownership of the work in the author, it allows employers to claim ownership if the work is done within "the scope of his or her employment." 17 U.S.C. § 101 (1982). This "work-for-hire" doctrine encompasses work products that result from the employment relationship; thus allowing the university to claim that faculty research is work for hire. Faculty, on the other hand, could argue that their work is not the kind intended to be included under the doctrine. These arguments were mooted, however, when pursuant to the Copyright Act of 1909, a "teachers' exception" to the work for hire doctrine allowed faculty to claim ownership. Ownership of copyrightable work became a part of the bargain between the university and faculty.

The Copyright Act of 1976 has revived the ownership question. Some commentators question whether the Act removed the teachers' exception. The courts have not answered the question definitely. See, e.g., Hays & MacDonald v. Sony Corp., 847 F.2d 412, 416-17 (7th Cir. 1988) (dictum that teacher exception survived the 1976 Act because such works are not prepared for the employer); Weinstein v. University of Illinois, 811 F.2d 1091 (7th Cir. 1987).

Also see Reichman, supra note 3, at 648, n.41, 673 (1989); Dreyfuss, supra note 8, at 597-98, 600 (arguing that faculty should have ownership); Ver Steeg, Copyright and the Educational Process: The Right of Teacher Inception, 75 IOWA L. REV. 381 (1990).

67. The issue of who owns faculty-created software has became especially tangled. Courts are divided on whether and when software is patentable or copyrightable or both. Since universities have traditionally allowed faculty ownership of copyrightable products, supra note 66, but not of patentable products, the categorization of software as copyrightable or patentable often leads to determination of ownership. In addition to relevant legal arguments, universities may be tempted to classify software as patentable so that they can justify their claims to the software and the potential income derived from the software. Reichman, supra note 3, at 677, n.201, 678, n.205, 713 (describing policies at Stanford University and Carnegie-Mellon University). Even if the software is deemed to be copyrightable, the issue of ownership is not necessarily resolved. See discussion on viability of teachers' exception to work-for-hire doctrine, supra note 66; and Lawren, Continuum: Who Owns the Idea?, OMNI 35 (March 1985) (discussing Professor Wolfram's case).

68. MIT Policy, Johns Hopkins Policy (claims dependent on "university support"), Rochester Policy, Duke Policy, all supra note 61.
69. See discussion accompanying notes 40-46.

70. Also see Johns Hopkins Policy, supra note 61, where the university claims ownership only if there has been "university support." University support is defined as financial or other support which is used directly in the discovery or development of the invention and is provided through university channels, regardless of its origin.

71. E.g., Johns Hopkins Policy, supra note 61 ("Provision of an appointment and/or space shall not in and of itself be construed as University support . . ."); Cornell Policy, supra note 61 ("university resources" discussed as part of maximalist approach); Illinois Policy, supra note 61 ("university resources" discussed as part of its supra-maximalist approach).

72. MIT Policy, supra note 61.

73. The use of office, library, machine shop facilities and the traditional desktop personal computers and Project Athena are examples of facilities and equipment that are not considered significant. MIT Policy, supra note 61.

74. As stated in Columbia Policy, supra note 61: "The University claims, as it may fairly and rightfully do, the commercial rights in conceptions that result primarily from the use of its facilities or from the activity of members of its faculty while engaged in its service." Also see, e.g., Yale Policy, Cornell Policy, Michigan Policy, Texas A & M Policy, all supra note 61.

75. E.g., Cornell Policy, supra note 61, expressly provides for faculty's reversion rights under certain circumstances.

76. In Reichman, supra note 3, the author characterizes universities as either wanting to embrace the opportunities for commercializing research ("maximalist" approach) or wanting to minimize the importance of the commercialization potential of research ("minimalist" approach). Universities that adopt a maximalist or supra-maximalist approach in their policy toward ownership of the inventions are likely to be or aspire to be universities that Reichman would describe as maximalist in their general strategy toward commercialization of research.

77. Yale Policy, supra note 61.

78. E.g., the University of Pittsburgh requires that each faculty member submit a "Faculty Activity Report" every Fall and Spring Term. In addition to time spent in "instruction for credit," the form asks faculty to indicate the time spent in continuing education; research, creative and professional activities; and professional community/public service. The clear
inference is that a faculty member's scope of employment may entail these activities. Some universities, recognizing the difficulty of discerning between what is within or outside faculty's scope of employment, have shifted the burden of proof to faculty to show that their activities are outside the scope of employment or that they have not made substantial use of resources. See Duke Policy, supra note 61. The enforceability of this duty, however, is questionable considering that common law requires that the university as the employer has the burden of proof. See supra note 25.

79. Washington Policy, supra note 61. Also see North Carolina Policy, supra note 61.

80. E.g., California Policy, Texas Policy, Illinois Policy, all supra note 61. In some states, these very expansive terms could violate state laws intended to protect employees from overreaching employment terms. See infra note 115. The California Policy and Illinois Policy expressly recognize the application of state statutes.

81. Texas Policy, supra note 61 (sponsors include federal government, nonprofit or for profit nongovernmental entity, or private gift); Illinois Policy, supra note 61 ("private" sponsors only). Linking ownership rights to the existence of a sponsored research project may be more consistent with the common law. Since the common law endows the employer with ownership only if the employee is hired to invent, the existence of a sponsored project with detailed objectives supports a conclusion that the faculty member was hired to invent.

82. Policies usually defer to the rights of sponsors, as provided for in funding agreements. However, faculty could circumvent university claims of ownership by setting up their own companies. These faculty-owned companies could sponsor their research, and pursuant to "funding agreements," require company ownership.

83. The University of Illinois uses a standard funding agreement providing that the university owns all resulting inventions and that the sponsor receives the first option to negotiate a license of the invention. University of Illinois Standard Research Agreement (For Commercial Sponsors).

84. California Policy, supra note 61. State law, CAL. LAB. CODE §§ 2870-2872 (West 1989), will not allow the employer to claim inventions that meet four conditions: if the invention (1) does not relate to the employer's business, (2) does not result from the employee's work for the employer, (3) was developed on the employee's own time, and (4) was developed without the use of the employer's resources. The law clearly exempts very few inventions from the employer's claim.
85. Pittsburgh Policy, supra note 61. The policy provides for factors that the University Patent Committee may consider in determining a division of royalties different than the one provided under the policy. These factors include where discovery was made or the lack of relevance to the "regular" work of the faculty member. These factors make clear that the scope of the university's ownership claim extends to those inventions that may arise in non-university facilities and outside the faculty's regular work; in other words, outside the faculty's scope of employment. The policy also provides that nonpatentable discoveries that "may have commercial value or potential as revenue producers" also are subject to this policy.

86. Royalty arrangements vary. Faculty's share may vary from 10% to 50%, with 50% being a likely allocation. See survey, described in supra note 61. The percentage may also be on a sliding scale, with faculty's percentage decreasing as the income flow increases. An example is Yale's arrangement, providing for 50% on the first $100,000, 40% on amounts between $100,000 and $200,000, and 30% on amounts exceeding $200,000. Yale Policy, supra note 61. Also see Cornell Policy, supra note 61 (providing that after royalties are paid to the faculty inventor, the remaining income may be distributed among the faculty's department, and general support of university research).


88. At the Pittsburgh Conferences, supra note 1, university administrators when questioned by the author about their policies of university ownership, frequently referred to rationales 1, 2, and 4. They presumably took for granted that their policies were consistent with law and were legally enforceable.

89. As stated in the Utah Policy, supra note 61: "In claiming title to the inventions of its employees, the University follows a normal policy long practiced by other universities and private corporations."

90. Stanford Policy, supra note 61 ("Unlike industry and many other universities, Stanford's invention rights policy allows all rights to remain with the inventor if possible."); Wisconsin Policy, supra note 61 ("The University of Wisconsin-Madison's tradition of not claiming proprietary rights in any invention generated by faculty, staff, and students under funding containing no patent restrictions remains unchanged.").

The Stanford Policy, however, treats differently what it labels as "tangible research property" (TRP). TRP is defined as "tangible (or corporeal) items produced in the course of research projects supported by Stanford or by external sponsors." TRP expressly includes biological materials and computer software. As distinguished from inventions and patents, the University claims ownership to TRP. Stanford Policy, supra note 61. While
a university administrator claims that the University's claim to TRP is acceptable to faculty, at least one faculty member stated "I don't know anybody here who works with software who thinks the policy is anything but a disaster." Lawren, supra note 67. It is unclear why Stanford treats TRP differently, especially since their general policy of faculty ownership apparently has served the university community's interests well. See text accompanying notes 95-96.

91. Minnesota Policy, supra note 61. Sponsored research includes research funded by either external entities such as government and industry or by the university for the specific "purpose" of supporting research, typically from a grant program. Under this policy, the university claims title only to inventions arising from sponsored research where the funding agreement requires faculty "disclosure and disposition" of the inventions. If the funding agreement does not require faculty disposition, faculty are put in a difficult situation. If faculty do not "protect and/or commercially exploit" their inventions, the university will not claim any ownership interests. On the other hand, if faculty decide to protect and exploit their inventions, the university has the "first right to acquire title." This provision thus provides faculty with a disincentive for commercializing their research.

92. Harvard Policy, supra note 61.

93. If there is "substantial university involvement," such as a joint venture, substantial financial or other assistance, or extensive use of special rare university facilities, such as museum collections, the university may receive by explicit agreement a more favorable position. Harvard Policy, supra note 61. In addition, in the absence of an agreement, there is the possibility of faculty reimbursing the university for costs associated with the invention.

94. The university presumably claims ownership of inventions "primarily concerned with medical diagnosticians- therapeutics or public health" (public health related). Faculty do not have the option of owning and developing these inventions themselves. Faculty do have the first right to title to all other inventions, but their ownership interest is conditional upon their diligent protection and development of the inventions.

Identifying and treating differently inventions that may trigger important public interests might be justified. However, the university's unqualified usurpation of public health related inventions is unnecessarily drastic. If the university is concerned that public health related inventions are publicly accessible, there are other ways that the university can be assured of that outcome. For example, faculty could own the invention outright, with the university instituting a monitoring process of the invention's public accessibility. Periodically,
faculty would report to the designated university committee or administrator. The university could intervene if pre-determined standards of public access are not being met.

Another proposed solution would be for faculty to have the first right to ownership, conditional upon their development of the invention. This of course is the relationship that Harvard imposes on inventions that are not public health related. This conditional faculty ownership would assure Harvard that the faculty inventor develops the invention and makes it publicly accessible. If the inventor does not, the university can take over the process. Considering there are these less drastic ways for Harvard to address its public interest concern, automatic faculty forfeiture of ownership rights is unjustified. Faculty should at least be accorded the opportunity to develop their invention.

The other prong of Harvard's policy provides that faculty have conditional ownership of inventions which are not public health related. Making faculty ownership contingent on faculty's commercialization of the invention is a significant infringement on faculty's ownership rights. While this infringement may be justified when the invention is one that is public health related, it is an unreasonable imposition for inventions which do not trigger this public interest concern.

The owners of inventions should have the right to do with their invention whatever they please. Faculty may not want to seek legal protection or commercially develop their invention. Therefore, faculty should retain their unconditional ownership rights to these general inventions.

95. NATIONAL SCIENCE BOARD, supra note 61, at 302.

96. NATIONAL SCIENCE BOARD, supra note 61, at 348.

97. After an ownership dispute with the California Institute of Technology over computer software that he developed, physicist Stephen Wolfram stated, "When I left Caltech and started considering other job offers, one of my stipulations was a letter stating that my future employers would have no rights at all to any intellectual property that I generated," Lawren, supra note 67.

98. Stanford's policy toward computer software and other "tangible research property," however, may hurt their recruitment efforts. See supra note 90.

99. A study of faculty at the University of North Carolina--Chapel Hill and North Carolina State University--Raleigh who had received external grants or contracts for their research, substantiates that productive researchers have other opportunities. Nearly one quarter of these faculty said they
have been offered financial support to pursue their ideas commercially, 15.5% were offered a position in a firm, and 12.5% were invited into a partnership. Bird & Allen, supra note 5, at 589-90. At the same time, universities want to attract and retain these individuals since they are likely to be innovative and productive researchers.

100. While it is unclear how many faculty would act on their desires, 15.7% of those surveyed in the North Carolina survey indicated they have a desire to start up their own firm. Id. at 589.


103. Consider, for example, that U.S. businesses start more businesses abroad than do the companies of any other country. At the same time, foreign companies start more businesses in the United States than in any other country. See supporting statistics and further discussion in U.S. Dep't of Commerce, INTERNATIONAL DIRECT INVESTMENT: GLOBAL TRENDS AND THE U.S. ROLE 17-20, 37-51 (1988 ed.).

104. See discussion accompanying notes 200-01.

105. See discussion accompanying notes 200-13.

106. For example, in a recent article identifying the most promising and accomplished young "star" scientists in the United States, eight of the twelve individuals identified were at universities or university-affiliated institutions, three were in industry, and one's work setting was not identified. Bylinsky, supra note 2. Also see NLRB v. Yeshiva Univ., 444 U.S. 672, 686 (1980) (discussing faculty's responsibilities regarding academic matters).


108. Vitamin Technologist v. Wisconsin Alumni Research Found., 146 F.2d 941 (9th Cir. 1945) (dicta) (assignment enforceable; the university recognizes need for express assignments); Regents of the Univ. of Colo. v. K.D.I. Precision Prod. Inc., 578 F.2d 1264, n.11 (10th Cir. 1973) (if restricted to line of actual employment and not unreasonable in duration); 6 A. CORBIN, CONTRACTS § 1394 (2d ed. 1962).
The significance of the agreement between employees and the employer may vary. It may be evidence of whether employees are hired to invent. If they are hired to invent, and thus the employer owns the invention as a matter of law, then the agreement may be evidence of the employer forfeiting its rights to ownership. If employees are deemed to be not hired to invent, then employees own the invention as a matter of law, and the agreement may serve as evidence of employees' assignment of ownership.

109. See Note, supra note 12, at 875-80 (discussing enforceability problems, including allegations of fraud); RESTATEMENT (SECOND) OF CONTRACTS §§ 163, 164, 178.

110. 573 F.2d 976 (7th Cir.), cert. denied, 439 U.S. 860 (1978), on remand, 617 F.2d 460 (7th Cir.), cert. denied, 449 U.S. 975 (1980) (employer breached duty by fraudulently describing the inventions' ownership and market potential; court emphasizing the disparity in business experience between the employer and its employee).

111. 609 P.2d 733 (Okla. 1980).

112. Id. at 740.

113. Id. at 739, n.2.

114. Id. at 740.


While ostensibly these statutes protect employees' interests, in practice, they may limit ownership rights that employees would otherwise have as a matter of law. This could be the case with university faculty, as well as other types of employees.

Consider the following alternative scenarios. First, suppose that employees sign an assignment of virtually all inventions, regardless of the circumstances under which the invention was created. In the absence of a statute restricting contract terms, this scenario puts employees in the worst possible situation. However, most employers probably would not propose such as all-encompassing provision. It would make it difficult to recruit attractive employees because the provision would be over-burdensome and unreasonable; and even if employers did make such a proposal, it could be attacked as generally unenforceable.
The second scenario presumes that a statute restricting contract terms would be applicable. As discussed, the statutes differ on the kind of limitations they would impose. Any restrictions of course would be more helpful to employees than an all-encompassing assignment. On the other hand, the statutes are not as advantageous to employees as the third scenario.

In this scenario, there is no "protective" statute and there is no contract providing for assignment. In other words, the common law would be applicable. This scenario describes most employment situations. The common law begins with the presumption that employees own all their inventions. The exception is specific, essentially requiring that the employee is hired specifically to invent that which was invented. Significantly, this exception appears to be narrower than the restrictions imposed under the statutes, reserving for the employee a broader panoply of ownership rights. Thus, employees would be in the best position with the least infringement of their ownership rights. If the legislators really wanted to be protective of employee inventors, one wonders why they did not merely codify the common law.


117. Weston, "Outside" Activities of Faculty Members, J.C. & U.L. 68, 69 (1980-81) (describing many faculty contracts as comprised of "university's faculty handbook, a departmental handbook, departmental policies, and various pamphlets on fringe benefits and personnel administration . . . Undergirding any written contract are the custom and usage of the higher education community in general, and of your institution in particular.").

118. An exception is the University of California, which has faculty and other employees sign two specific documents as a condition of their employment, the State Oath of Allegiance and a Patent Agreement. The University’s Patent Policy accompanies the Patent Agreement. The Agreement provides that all employees are required to assign to the University, at the University's request, any patentable invention conceived or developed "while employed by the University, or during the course of my utilization of any University research facilities . . ."


120. RESTATEMENT (SECOND) OF CONTRACTS § 69 (acceptance by silence).
121. Even if there is a policy, the policy may be deemed to be inapplicable to some types of research results. At many universities there may not be a comprehensive policy, for instance, on trademarks and copyrights. E.g., Texas A & M University has a policy covering patents and copyrights, but not trademarks. Texas A & M Policy, supra note 61.

122. RESTATEMENT (SECOND) OF CONTRACTS §§ 3, 18, 19, 69.


125. Id. at 201. Also see Gerber, Patents--Inventions by Federal Employees and Contractors--Disposition of Title and Rewards, 35 J. PAT. OFF. SOC'Y 426, 429 (1953).


128. See analogy in Dinwiddie v. St. Louis and O'Fallon Coal Co., 64 F.2d 303 (4th Cir. 1933) (where university engineer and professor allow corporate sponsor to pay expenses).


130. The university's conduct also could be used as evidence of faculty ownership. For instance, faculty have patented many inventions in their own names. If universities have not filed suits attacking the validity of these patents, this could be evidence that the university believes that faculty own the inventions. Amoco Produc. Co. v. Lindley, 609 P.2d 733 (Okla. 1980) (employer's conduct relevant to show employee ownership). The courts, however, have tended not to use employer's conduct in this way. E.g., Speck v. North Carolina Dairy Found., 307 S.E.2d 785 (N.C. App. 1983), rev'd, 311 N.C. 679, 319 S.E.2d 139 (1984) (court ignores evidence that university counsel admitted that faculty had legitimate ownership claims).

131. For example, the University of Pittsburgh Policy, supra note 61, has been in existence since January 1978, with revisions or additions made in 1985, 1988, and 1990. A copy of the policy was widely disseminated to faculty in August 1990.
According to an informal survey of faculty conducted by the author, the 1990 dissemination was the first time they remembered seeing the policy. None of the faculty had actually read the policy.

132. Are discoveries created when the idea is originally conceptualized, when the idea is operational and practically applied, or when the idea meets all the requirements for legal protection (i.e., patentable)? Other legal rights may depend on when the invention originated. For example, the determination of whether the faculty member was hired to invent is done at the time of the invention. Houghton v. United States, 23 F.2d 386, 390 (4th Cir.), cert. denied, 277 U.S. 592 (1928).

Analogous problems exist in the corporate opportunity area. There the courts must decide if the opportunity which the officer claims originated while the officer had a duty to his or her corporation. See Chew, Competing Interests in the Corporate Opportunity Doctrine, 67 N.C.L. REV. 435, 445 and n.25 (1989).

133. Central Adjustment Bureau, Inc. v. Ingram, 678 S.W.2d 28 (Tenn. 1984) (recognizing that noncompetition agreements may not be supported by adequate consideration if entered into during an already established employment relationship). Also see Freeman v. Duluth Clinic, Ltd., 334 N.W.2d 626, 630 (Minn. 1983); and Faw, Casson & Co. v. Cranston, 375 A.2d 463, 466 (Del. Ch. 1977) (holding that noncompetition agreements entered into during employment relationship must be supported by beneficial changes in employee's status, such as promotions, or other bargained for advantages).


135. 509 A.2d at 824-25.

136. 509 A.2d at 826-28 (citing cases and other jurisdictions who took the same approach).

137. 524 A.2d at 869.


139. See Gabig, id., at 194 (describing confusion of pre-1980 situation).

141. 35 U.S.C.A. § 201 (1980); 37 C.F.R. § 401.1(b) (1990). Also applies to small business firms and other non-profit organizations. Id.


143. Interviews by the author with Sandy Shotwell, Howard Jenerick, and Sydney Parker of the National Institute of Health, Oct.-Nov. 1990 [hereinafter "Interviews"].

144. 35 U.S.C.A. § 202(d) (1980); 37 C.F.R. § 401.9 (1990) (subject to the same conditions imposed upon a small business firm contractor).

145. Interviews, supra note 143; 45 C.F.R. § 650.9 (1990) ("Such requests will normally be granted unless the awardee [university] shows that it would be harmed by that action.") This entire process assumes that faculty have already assigned their original rights to the university. This assumption may not be correct. See discussion accompanying notes 117-37.

146. 37 C.F.R. § 401.14(f)(2) (1990). The implementation of this disclosure requirement may be problematic. As Roger Ditzel points out, faculty are required to disclose only those inventions that are patentable (35 U.S.C.A. § 201(d), (e) (1980). Thus, if the inventor believes in good faith that the discovery is not patentable, he or she will not disclose it. Interview by author, Nov., 1990.


148. 37 C.F.R. § 401.14(f) (1990) (also requiring that the university as contractor instruct its employees "through employee agreements or other suitable educational programs on the importance of reporting inventions in sufficient time to permit the filing of patent applications prior to U.S. or foreign statutory bars.").

149. Interviews, supra note 143.

150. The government also is concerned that these assurances, as well as the total funding process, is achieved in the most administratively convenient manner as possible. Interviews, supra note 143. Recent disclosures about Stanford University and other universities using federal funds inappropriately, suggest that the university is not always the best caretaker of the government's interest. Hilts, U.S. Acts to Restrict College Research Grants, N.Y. Times, April 23, 1991, at A9, col. 4.
151. See discussion accompanying notes 107-37.

152. Or any other third party.

153. 35 U.S.C.A. § 201(c) (1980) provides that the contractor may be a person, including presumably the faculty researcher. Interviews, supra note 143, indicate that the faculty researcher has occasionally been the contractor.


156. "The term 'invention' means any invention or discovery which is or may be patentable or otherwise protectable under this title or any novel variety of plant which is or may be protectable under the Plant Variety Protection Act . . ." 35 U.S.C.A. § 201(d) (1980). Also see 35 U.S.C.A. § 201(e) (Supp. 1984).

157. The National Institute of Health (NIH), National Science Foundation (NSF), and the Department of Defense (DOD) provide about 80% of total federal funding of academic research, with NIH providing almost 50% of the total. The Department of Energy (DOE), National Aeronautics and Space Administration (NASA), and the U.S. Department of Agriculture (USDA) also provide a significant amount of funding. NATIONAL SCIENCE BOARD, supra note 61, at 109, 300, 302.

158. NATIONAL SCIENCE BOARD, supra note 61, at 108, 297.

159. Institutional funds are those an institution spends on research and development, including unreimbursed indirect costs associated with research projects financed by other sources. Id. at 108, n.7. The inference is that the university directly provides only a limited amount of research funding.

160. Id. at 111-12.

161. Id. at 302.

162. Id. at 108, 298. This data discounts the argument that public institutions, unlike private institutions, have a more legitimate claim to faculty inventions since faculty research is publicly funded. Furthermore, even if public funding is relevant to a determination of ownership, it would argue for public, not university, ownership of the inventions.

163. Id. at 302.
164. CMU receives approximately $16 million and Pittsburgh receives approximately $6.5 million from industry sources. Id. In 1987, 49 schools received over 10% of their research funding from industry. Id. at 110.

165. Id. at 307.

166. Based on discussions between university administrators and the author. Pittsburgh Conferences, supra note 1.


170. Speck, 319 S.E.2d 140, 141.

171. Id. at 141.

172. Id.

173. Id. at 142.

174. Id. at 142.

175. In 1978, the University's Patent Committee chairperson recommended that Speck be paid a one-time royalty payment of 15%. He noted that this was the established procedure for faculty inventions, and that another professor in Speck's department had recently received such a royalty payment. In addition, he recommended that the university clarify the claims of the inventors and that it would be prudent to get Speck to formally execute an assignment of his rights in exchange for the one-time royalty payment. Speck, 307 S.E.2d at 788.

176. In 1976, a legal advisor to the university stated that since Speck's invention was not subject to the university's patent policy, all ownership rights were automatically returned to the inventor. The advisor then assumed that Speck had given the invention to the university, although there was no evidence of any assignment of these rights. Id.; 319 S.E.2d at 144.

177. 307 S.E.2d at 789.

178. Speck originally argued that the university owed him royalties on the basis of an unjust enrichment argument. The statute of limitations on implied contractual actions, however,
caused him to shift his claim to one based on a breach of the university's fiduciary duty. Id. at 788; Note, supra note 168, at 1250.

179. 307 S.E.2d at 789.

180. Id. at 789, 790.

181. He questioned this assumption as late as 1974. 319 S.E.2d at 142.

182. 307 S.E.2d at 788, 789. The university later changed its policy so that non-patentable inventions would be included. Id. at 788.

183. See discussion accompanying notes 120-25.

184. Speck wrote to his superiors on November 1975 stating that he thought it was "Entirely proper for the Dairy Foundation to be selected for the commercial development and marketing of 'SWEET ACIDOPHILUS' and to be the University's agent to receive any royalties from our development. In attending to the various legal aspects of this project (which was the first experience for a number of us) participation by the inventor in the royalties was overlooked. It would seem that now is an appropriate time to take care of this matter." 319 S.E.2d at 142 (emphasis added).

185. In 1973, Speck reportedly wrote a letter conceding Foundation ownership. 307 S.E.2d at 788. But in late 1974, he called the foundation asking if the foundation owned the "trademark." They told him yes. 319 S.E.2d at 142.

186. 319 S.E.2d at 140.

187. Id. at 143.

188. Id.

189. Id. (emphasis added).

190. Perhaps the court acted on its own personal instincts on what the law should be. Some of its comments suggests, for instance, that it thought that public welfare would best be served by university ownership. Id. at 145. Or perhaps the court had an insufficient knowledge of the facts. See Note, supra note 168, at 1251, commenting on court's limited exposure to the facts.


192. For example, the Chairperson of the University Patent Committee suggested that the University be responsive to Speck's request for some share of the royalties "in order to prevent the
possibility of the development of 'hard feelings and tensions' within the faculty." 319 S.E.2d at 143.

193. The court emphasized that his course of conduct indicated university ownership, even though his inexperience strongly suggests he did not understand the consequences of his actions. 319 S.E.2d at 144, 142.

194. It is unclear from the case why Speck's process was not patentable. The university later added trademarks to its policy (307 S.E.2d at 787), although the appellate court had no evidence of such a change. 319 S.E.2d at 144.

195. 307 S.E.2d at 788.

196. 319 S.E.2d at 144.

197. M. EPSTEIN, MODERN INTELLECTUAL PROPERTY, Ch. 13 Ownership of Employee Inventions (1989); P. SAMUELSON & K. DEASY, INTELLECTUAL PROPERTY PROTECTION FOR SOFTWARE 4-6 (1989); Reed Smith Shaw & McClay, AN INTRODUCTION TO PATENTS TRADEMARKS COPYRIGHTS AND TRADE SECRETS (1989).


199. Reichman, supra note 3, at 640 (questioning whether these traditional categorizations are appropriate for products of new technology); Eisenberg, Proprietary Rights and the Norms of Science in Biotechnology Research, 97 YALE L.J. 177 (1987) (questioning whether intellectual property laws are congruent with the norms and incentives of the scientific community).

200. American Assoc. of Univ. Professors, Academic Freedom and Tenure: 1940 Statement of Principles and Interpretive Comments, AAUP POLICY DOCUMENTS & REPORTS 3 (1984 ed.). A similar principle is: "A college or university is a marketplace of ideas, and it cannot fulfill its purposes of transmitting, evaluating, and extending knowledge if it requires conformity with any orthodoxy of content and method. In the words of the United States Supreme Court, 'Teachers and students must always remain free to inquire, to study and to evaluate, to gain new maturity and understanding; otherwise our civilization will stagnate and die.'" American Assoc. of Univ. Professors, 1982 Recommended Institutional Regulations on Academic Freedom and Tenure, 1940 Statement of Principles and Interpretive Comments, AAUP POLICY DOCUMENTS & REPORTS 21 (1984 ed.); American Assoc. of Univ. Professors (L. Joughin ed.), ACADEMIC FREEDOM AND TENURE 163 (describing purposes of the university (1969 ed.).
201. For example, industry sponsors may want research to remain confidential to preserve the company's competitive advantage, while faculty have a priority for publishing research as soon as possible. Fowler, University-Industry Research Relationships: The Research Agreement, 9 J.C. & U.L. 515, 523-24 (1983).

202. A 1982 meeting of university presidents discussed some of these institutional concerns. Pajoro Dunes Conference, supra note 3, at 533. Also see Johns Hopkins Policy, supra note 61; D. Dickson, supra note 49, at 56-106 (discussing concerns about the values and objectives of basic research being jeopardized by the universities' increasing entrepreneurial activities).

203. Some policies require that faculty cooperate in the development of the invention. E.g., Cornell Policy, supra note 61.


205. Id.

206. While it is not unusual for university departments to prefer one disciplinary approach toward research over another, it generally does not rise to an infringement of academic freedom. If the university's vested interest in research increases, i.e., they are owners of the research, the occurrence of infringements on academic freedom are more likely to increase.

207. NATIONAL SCIENCE BOARD, supra note 61, at 108.

208. Id.

209. Id.

210. Bartlett & Siena, Research and Development Limited Partnerships as a Device to Exploit University-Owned Technology, 10 J.C. & U.L. 435 (1983-84); Gilliland, supra note 3. Also see Reichman, supra note 3, at 711, 718-19 (describing university's increasing interest in entrepreneurship and the inherent risks).

211. For instance, trustees and officers of the university may be sued for breaching their fiduciary duties by their decision to immerse the university in speculative commercial activities. See Jones v. Grant, 344 So. 2d 1210 (Ala. 1977) (faculty, staff, students have standing to sue president and directors of private college). The tax exempt status of universities also may be vulnerable if the earnings of university operations inure to private parties. See I.R.C. § 501(c)(3) (1988); Fowler, supra note 201, at 518-19, nn.10, 11.
212. Illustration taken in part from interview with E.L. MacCordy of Washington University, Nov. 1990.


214. E.g., Markoff, A Battle to Make Software Free, N.Y. Times, Jan. 11, 1989, at B1, col. 1 (describing expert computer programmer Richard Stallman of the Massachusetts Institute of Technology, who believes that software "should be freely shared and devotes himself to creating sophisticated programs that he gives away.").

215. Consider, for example, Columbia Policy, supra note 61: "The University believes that faculty members must take the ultimate moral responsibility for the development and commercial exploitation of the fruits of their intellectual activities." Since the University claims "commercial rights" in faculty inventions, it is unclear how faculty are suppose to carry out this moral mandate.

216. Pamela Samuelson suggests, for example, the possibility of faculty publishing a paper about a patentable idea without the university’s knowledge. The grace period of one year passes, and now the invention is not patentable because it is not considered "novel" under U.S. patent laws. Under foreign patent systems requiring "absolute novelty," patent filing would have to occur before faculty publish any information about the idea. If the university claims ownership to faculty work, can it sue the faculty for squandering university "property"?

217. As eloquently described by Dreyfuss, supra note 8, in an article discussing university-generated copyrightable work products, the creative process can be broken down into four
stages: conceptualization, fruition, dissemination, and use. Various decisions and problems arise at each stage. Because of the personal and peculiar nature of the creative process, the optimal resolution of these problems is likely to occur when the faculty creator owns all the rights to the creative work. If the university is the owner, it is more likely to make decisions that are inappropriate and consequently impair the quality and nature of the work or the creator's creative output.

218. On the other hand, consider the natural and universal temptations described in the story about the goose that laid the golden egg. The owner, tempted by foolish greed, harms the "source of continuous wealth in an attempt to gain a temporary good." G. JOBES, DICTIONARY OF MYTHOLOGY, FOLKLORE, AND SYMBOLS, Part 1, 677 (1962). In Western Europe, the Grimm's story is that the individual feathers of the golden goose bring wealth, but greedy persons cannot pull their hands away from the bird. FUNK & WAGNALLS STANDARD DICTIONARY OF FOLKLORE, MYTHOLOGY, AND LEGEND 460 (M. Leach ed. 1984). In an Indian version, the golden feathers are torn out all at once and they become worthless. Id.

219. Not all faculty are in a position to effectively bargain with the university to assure that fundamental faculty rights are protected and that both university and faculty are fairly treated. Therefore, a faculty committee, perhaps in consultation with the American Association of University Professors or other professional organization, might be more appropriate to negotiate the general terms of the university policy.

While the beginning presumption should be that faculty own their own inventions, the particular needs and priorities of the individuals and the institution may suggest various modifications. E.g., see note 220. Faculty may even assign their ownership interest to the university. However, faculty should be knowledgeable about their legal rights and about the consequences of their assignment to the university. They should know that as a matter of law they own their inventions. If they do assign their inventions, they should understand that they are giving up ultimate control of the invention in such fundamental questions as product design, licensing, distribution, and royalties.

Ideally, faculty should consider these terms when they are interviewing for their university positions. This assures that faculty can factor in these terms in their negotiations with the university. In addition, it increases the probability that the policy's terms will be enforceable.

220. In structuring the relationship between the various parties regarding such issues as ownership and rights associated with ownership, a range of creative options exists. For example, the parties may share ownership as co-owners (joint ventures).
The ownership division may be evenly split 50-50 or any other distribution may be used. There may even be third or fourth co-owners, such as a funding institution or the faculty's particular department.

Ownership also need not be absolute. A party could have the first right to ownership, but that ownership could be conditioned upon the party taking a particular action. If that action is not taken, another party could have "march-in rights" to ownership. These variations are illustrated in the following table:

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<tr>
<th>I. OWNERSHIP</th>
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<td>Full ownership</td>
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<td>Partial shared ownership</td>
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<td>Absolute ownership</td>
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<td>Conditional ownership</td>
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<td>March-in rights to ownership</td>
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<tr>
<th>II. BUNDLE OF RIGHTS ASSOCIATED WITH OWNERSHIP</th>
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<tr>
<td>Legal protection</td>
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<tr>
<td>Information dissemination</td>
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<td>Financing for commercialization</td>
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<td>Product development</td>
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<tr>
<td>Marketing, including licensing and distribution</td>
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<td>Beneficial rights, such as royalties</td>
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<tr>
<th>III. PARTICIPATORY ROLE IN EXERCISE OF RIGHTS</th>
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<td>Input</td>
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<tr>
<td>Disclosure and notice</td>
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<tr>
<td>Shared decision-making</td>
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<tr>
<td>Approval (veto power)</td>
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<td>Unilateral decision-making</td>
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Furthermore, since ownership in an invention is really a bundle of different legal rights, the university or faculty could unbundle and share the rights. The parties could tailor the arrangement according to what each wants to control. As shown in the table, the university might retain the rights associated with legal protection, such as obtaining a patent, while the faculty might have rights associated with product development. Both faculty and university might retain rights associated with distribution and marketing decisions, such as licensing rights and rights associated with beneficial ownership such as the royalties. Respective rights might even differ for different types of inventions.

In addition, there are many ways that a party can participate in the exercise of the rights associated with ownership, as illustrated in the table. They may share decision-making or one party may make decisions, but with the input and approval of the other party. Or faculty and the university could enter into a more contractual relationship. Each could contribute to the process what it does best or in what it has the most interest. Thus, faculty might retain total ownership, but the university acts as an active broker, intermediary, or consultant to the faculty on the different stages of product development. The university could either provide the expert services themselves, in such cases as patent applications or other legal protection. Or, it might identify experts, such as product development companies, and act as an ongoing product manager on the faculty's behalf. For example, the patent filing application can be technical and costly. The university may be in the best position to pay these fees and to coordinate the filing process. For these services, the university could be reimbursed for its cost, be paid on third party compensation terms, or receive a percentage of royalties.

For discussion on range of ways to structure relationship between the university and third parties, see also Bartlett & Siena, supra note 210; Gilliland, supra note 3; Brinton, Biotechnology Licensing: Issues from the University Perspective, 16 AIPLA Q. J. 480 (1988-89); Fowler, supra note 201.