

University of Georgia  
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“The Kept University”

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Thanks for coming out tonight. Before I begin I would just like to thank George Felis for inviting me here to speak. Since I know that many of you in the audience are graduate students, I will make a special effort to provide some examples that might be more directly relevant to your experience to provoke discussion and debate in the question and answer period.

Increasingly, we live in an Age where ideas are seen as commodities, and the control of information is central to our economy, so it's really no surprise that, in this context, universities are coming to be seen as incubators of new ideas and are being asked to play a more prominent role in fueling our nation's economic growth. Both the biotechnology and computer engineering revolutions, after all, were largely born out of university research labs.

My own research and journalistic reporting on this issue (for the *Atlantic Monthly* and other publications) however, suggests that this process of collaboration--although it may be a natural outgrowth of our knowledge-driven economy--has several potential fault-lines. Collaborations between industry and academia hold great promise, but universities need to be careful. Without adequate safeguards, universities risk losing their unique and privileged position in our society as places of disinterested inquiry, basic non-directed research, and critical thought.

Now I realize that that is a big claim. So what's my evidence? Well, the first place I visited when I was reporting for the *Atlantic Monthly*

was the University of California at Berkeley—one of our nation’s preeminent public universities—which in November, 1998 signed a five-year, \$25 million dollar sponsored-research agreement with Novartis, a Swiss-based pharmaceutical company and producer of genetically engineered crops.

[\*I should briefly note that Novartis’s agricultural research division is now called Syngenta, but for the purposes of this talk I will continue to refer to it by its old name.]

The Novartis agreement provoked an uproar on the Berkeley campus and subsequently led to hearings in the California State Senate. Among the most vocal and well-organized critics of the deal was a graduate-student group called Students for Responsible Research, which objected to the secrecy that surrounded the negotiation process and sought to gather and publicize information about the deal.

Critics on campus believed that several aspects Novartis deal seriously compromised academic freedom and the autonomy of a public university.

- First, the deal allowed one private corporation to provide 1/3rd of the research budget of an entire department—the Department of Plant and Microbial Biology—at a public university.
- Second, the deal granted the company first rights to negotiate licenses on up to 1/3rd of the Department’s discoveries, including research that was funded *not only by Novartis, but by federal and state sources as well.*
- Third, Novartis was given 2 out of 5 seats on the university’s research committee, which sets the research agenda for the Department and chooses which projects to fund.

The Novartis deal left the faculty in Berkeley’s College of Natural Resources deeply divided. A faculty survey conducted after the agreement was signed revealed some striking findings:

- Although 41% of the faculty in Berkeley's College of Natural Resources supported the agreement as signed.
- Over 50% believed it would have a "negative" or "strongly negative" effect on academic freedom.
- Roughly half believed it would erode Berkeley's commitment to "public good research."
- And another 60% believed it would impede the free exchange of ideas within the university, which is really the hallmark of academic life.

ONE PROFESSOR I SPOKE WITH at Berkeley, Ignacio Chapela, then chairman of the College of Natural Resource's Executive Committee, a faculty governing body, told me that he no longer felt he could talk freely to his colleagues in the Department of Plant and Microbial Biology. The reason was that he knew professors within the Department were now obligated to keep proprietary information secret, and he, himself, was afraid to share ideas that might then be handed over to Novartis. It's worth noting that Chapela is not a knee-jerk critic of university-industry alliances. In fact, before coming to Berkeley he spent three years working for none other than Novartis—then named Sandoz. But Chapela does object to the way this deal institutionalized Berkeley's relationship with one company.

Was this deal just an aberration? In many ways it was not: Since 1985, corporate funding of universities has grown from \$850 million to over \$4.25 billion. Washington University has a long-standing agreement with Monsanto; MIT has a \$15 million agreement with Merck & Co; Harvard's Beth Israel Deaconess Hospital recently solicited bids from 40 companies to conduct joint research at a new medical facility. And these are just a tiny fraction of the collaborations that exist.

Another marked trend is the boom in industry-endowed chairs:

- Freeport McMoRan, a mining company—which several years ago was the number one polluter of water in America—now holds a chair in environmental studies at Tulane;

- Kmart has endowed a chair at West Virginia University which requires its holder to spend up to thirty days a year training store managers.
- Elsewhere, buildings, athletic complexes, in some cases whole academic departments, bear the names of corporate sponsors.

The growing commercialization of the academy can be traced to the Bayh-Dole Act of 1980, which actively encouraged universities to patent federally-funded research on a wide-scale for the first time. Congress' intent in passing Bayh-Dole was to bring ideas out of the ivory tower and into the marketplace more quickly to help fuel U.S. economic growth at a time when there was considerable alarm about rising competition from Japan.

Remarkably, despite the economic rationale that led to the passage of Bayh-Dole Act, there has been very little economic analysis of Bayh-Dole's impact. Statistics put out by AUTM—a group of university technology managers—have been widely reported and look impressive. For example, AUTM estimates that over 2,500 new start-up companies have spun directly out of academic research labs since Bayh-Dole, which is why you see a clustering of biotech and computer firms around universities in the Research Triangle, Silicon Valley and beyond. Over the last decade, moreover, university patenting increased 77%, and new licenses and options executed increased 129%. Many of these collaborations with the private sector have undoubtedly been good for the U.S. economy, and have helped bring many extraordinary new drugs and discoveries to the public.

But most economists agree that although patenting and licensing activity looks impressive on paper, it is a poor way to evaluate the economic impact of university-based research either before or after Bayh-Dole. Especially since publication, conferences and other non-proprietary means of technology transfer have historically been extremely important means of bringing knowledge and ideas to industry.

Whatever its economic impact has been, it was certainly not the only force pushing universities to collaborate with industry. Other forces include:

- The growing cost of doing research
- A leveling-off of federal science funding (in all areas except biomedical research).
- And a serious decline, in many parts of the country, in state support for higher education.

While the federal government still supplies a majority of the funding for academic research (60% or about \$14.3 billion)—the corporate share is growing. From 1980-1998, corporate-sponsored research expanded 8% annually, rising to \$1.9 billion in 1997—or nearly eight times the level of twenty years ago.

Finally, in addition to Bayh-Dole, it is important to note that Congress has implemented numerous additional programs and tax incentives designed to nurture university-industry collaborations. Because so many federal grants now involve financial cost-sharing with industry, it has been estimated that the private sector probably influences somewhere between 20-25% of academic research.

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THE PROBLEM, I BELIEVE, IS NOT UNIVERSITY-INDUSTRY COLLABORATIONS. These are important and should continue. The problem is that universities, in their drive to bring in research funding and to generate new sources of income, are increasingly allowing industry to dictate the terms of their support—in ways that fundamentally threaten academic freedom and the ability of the university to remain free of vested interests.

Put another way, the university—which is, really, the embodiment of our “common heritage”—is rapidly losing sight of the fact that serving private industry, is not the same as serving the public interest. The American Association of University Professors expressed this beautifully in 1915:

“All true universities, whether public or private, are public trusts designed to advance knowledge by safeguarding the free inquiry of impartial teachers and scholars. Their independence is essential because the university provides knowledge not only to its students, but also to the public agency in need of expert guidance and the general society in need of greater knowledge...”

In my talk, I will focus on three main areas of concern:

1: First, the growth in corporate-sponsored research poses a threat to the open culture of the university, the right to publish, and the ability of professors to perform disinterested research that the public can trust.

The days of unrestricted private grants appear to be disappearing. Increasingly, corporations are unwilling to invest in academic research unless they can IN SOME WAY control the results, which frequently means that corporations require professors to sign agreements laced with restrictive provisions, including new proprietary limits on sharing information within the academy and delays on publication.

- A recent study in the Journal of the American Medical Association (JAMA) found that 1 in 5 scientists delayed publication for more than six months to protect proprietary information. This despite the fact that the National Institute of Health (NIH) recommends that corporate sponsors be given no more than a 1-2 months delay on publication, which is sufficient time to apply for a patent.

Many scientists also report having an increasingly difficult time accessing basic research tools due to proprietary restrictions.

Steven Rosenberg, one of the country’s leading cancer researchers at the National Cancer Institute, told me that he is often asked to sign agreements to gain access to reagents that require him to keep the results and methods of his research secret for up to ten years.

Rosenberg has become so alarmed about this threat to the open exchange of information and research materials that he has called on professors and research institutions to reject these confidentiality agreements on principle—but few have heeded his call.

Beyond the question of secrecy lies a more serious concern: namely, the potential that companies will influence the design—and in some cases the results—of the studies they pay for.

In a recent article published in the *New England Journal of Medicine*, Dr. Thomas Bodenheimer, an internist and professor at the University of California at San Francisco (UCSF), conducted an extensive search of the medical literature and concluded that, over the past decade, the arms-length relationship between academic-medical researchers and their sponsors has dangerously broken down.

Bodenheimer found extensive evidence of:

- publication bias (a tendency among corporate sponsors to publish only results that are favorable);
- ghostwriting (wherein companies pay scholars to add their names to journal articles written by corporate marketing departments).
- And study-design bias. One study published in the *Archives of Internal Medicine*, for example, found that in 54% of company-sponsored arthritis-drug trials, the dose of the funding company's drug was higher than that of the comparison drug, increasing the chances that the funder's drug would appear more effective.

Bodenheimer also found that companies now frequently retain control over the raw data from a clinical trial, making it far easier to spin the results. Some principal investigators have the capacity to analyze all the data from a large trial. But increasingly, according to Bodenheimer, “companies prefer to retain control over this process.” One industry executive told Bodenheimer, “We are reluctant to

provide the data tape [to the professor] because some investigators want to take the data beyond where the data should go.”

- Dr. James Kahn, an AIDS researcher at UCSF recently experienced this corporate inference first hand. Last year, when Dr. Kahn and another biostatistician at Harvard, Dr. Stephen Lagakos, attempted to publish new research showing that an AIDS therapy was ineffective, their corporate sponsor, Immune Response, sought to block publication by refusing to release the complete data from the trial. Kahn and his colleagues pressed ahead with what they estimate was 95% of the critical data set, publishing an article in the Journal of the American Medical Association last year. But the company quickly responded by taking legal action against Kahn and the University, filing for \$10 million in damages.

Now some would say that stories like Dr. Kahn’s are exceptional. That is true, but the number of cases appears to be growing.

And, in several cases, the universities themselves have bowed to industry pressure, rather than defend their own professors.

- In 1996, for example, David Kern—the former director of occupational medicine at Brown University—was working under a sponsored-research agreement and discovered evidence of a dangerous new lung disease spreading among workers at a Rhode Island factory. Deeming this information a serious matter of public health, Kern announced his intention to publish his findings. But the company quickly threatened to sue, citing a confidentiality agreement which forbade the disclosure of “trade secrets.” In reality, Kern’s publication exposed NO TRADE SECRETS—it simply documented the existence of a new disease. But Brown University, rather than defending Kern, tried to dissuade him from publishing and eventually went so far as to eliminate his teaching and research position. Later, the Center for Disease Control recognized the new disease as “Flock Workers Lung.”

Mildred Cho, a researcher at Stanford's Center on Biomedical Ethics, points out that for every James Kahn or David Kern who steps forward to oppose overt forms of corporate influence like this, there are an unknown number of researchers who MAY voluntarily "toe the company line" by designing their research in such a way that it is more likely to reach conclusions favorable to the corporate sponsor.

Cho is suspicious of bias for good reason.

- In 1996, Cho published a study in the *Annals of Internal Medicine* which found that 98% of industry-sponsored drug research studies reflected favorably on the funding company's drug, versus 79% of non-industry funded studies.

Numerous other studies have exposed similar disparities, suggesting that when research is industry sponsored, there is a higher likelihood that the results will favor corporate interests.

- A study published last year in *JAMA*, for example, found that non-profit funded studies of cancer drugs were eight times more likely to reach unfavorable conclusions than industry-sponsored studies.
- Another analysis examining 70 studies of cardiac drugs (calcium channel blockers) found that 96% of authors who were supportive of these drugs had financial ties to the manufacturers. By contrast, only 37% of authors who were critical of these drugs had industry ties.

Now obviously the fact that a professor receives industry funding does not mean that his/or her research is necessarily biased. But will the public continue to trust academic research to the same degree? Should the public?

What's particularly troubling is that many professors who receive industry funding now also have extensive financial ties to the companies sponsoring their work:

- Sheldon Krimsky, an expert on conflicts of interest in science at Tufts, examined over 800 scientific papers published in a range of academic journals and found that slightly more than 1/3 of the authors had a significant financial interest in their reports. These interests included having a seat on the corporate sponsor's board or owning stock, for example.
- Even more alarming, according to Krimsky, these ties are rarely disclosed. Krimsky examined 62,000 research articles and found that corporate financial ties were disclosed only .5% of the time.

Even those who discount the significance of these conflicts of interest should, I think, be concerned that, IN THE ABSENCE of strong disclosure rules and oversight policies, such conflicts could undermine the public's trust in science—and in universities, themselves.

This danger was brought home dramatically after Jesse Gelsinger, an 18 year old boy from Tucson AZ, died in a gene-therapy experiment at the University of Pennsylvania in September 1999. In the Gelsinger experiment, both the lead researcher, Dr. James Wilson, and U. Penn had stocks in a company which was funding Wilson's lab. Both also stood to profit if the study was successful. Of course, the deeper problems at U. Penn involved serious medical and ethical violations by the lead investigators. These included failing to properly report serious adverse events, and withholding evidence that monkeys undergoing similar treatment had died in earlier experiments. But the potential for financial gain alarmed the public, and rightly so.

After Gelsinger's death, the Federal government found that numerous other gene-therapy researchers had similarly failed to report adverse events (and even several deaths), as required under federal law. Many of these investigators also had serious conflicts in that their experiments were funded by their own start-up companies.

Since 1999, federal authorities have shut down or restricted research at nine universities, due to their failure to properly oversee human clinical trials.

As David Korn of the Association of American Medical Colleges recently warned, if we expect the public to continue funding academic research and trusting the results, “even the perception that faculty investigators or their institutions have financial interests that might compromise their independence and credibility cannot be tolerated.”

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2: THERE IS A SECOND PROBLEM with the way commercialism is being pursued on campus today. In their eagerness to cultivate alliances with industry, universities are beginning to look and behave like for-profit companies themselves.

- Schools like Johns Hopkins now operate their own internal venture capital funds to bankroll commercially promising lines of research.
- And universities are investing heavily in companies sponsoring their professors research, creating the potential for major institutional conflicts of interest to arise as well: In the 1980's and 1990's, for example, Boston University plowed nearly a fifth of its endowment into a biotech firm, found by several BU professors. Later, when the company's stock plummeted, the university was accused of egregiously mismanaging the school's endowment to prop up the company and protect the trustees' investments.

Meanwhile, universities also have taken to guarding their intellectual property as aggressively as any business would.

Traditionally, universities regarded patents and other intellectual property restrictions as standing in direct conflict with their role to disseminate information as freely as possible. But today, as a result

of Bayh-Dole, most schools have technology licensing offices dedicated to commercializing their professors' discoveries and managing the university's burgeoning patent portfolio.

Of course, on its face, there is nothing wrong with this activity. But where should universities draw the line between their own commercial interests and their commitment to serve the public good?

- Columbia University recently drew a lot of criticism recently when it enlisted an influential alumnus, Senator Judd Gregg, to sponsor legislation that would extend the life of a lucrative biotechnology patent the school owned. The patent—on a rare blockbuster discovery—brought about \$100 million a year in revenue to the school, so Columbia had an interest in keeping these revenues flowing. But, from a public interest perspective, the University's active lobbying looked pretty bad, since the legislation would have denied generic companies the right to bring cheaper generic drugs to market.
- There are other indications that university priorities are becoming skewed by their newfound commercial interests. A National Institute of Health (NIH) working group recently expressed alarm that universities are no longer freely exchanging basic research tools and reagents among scientists—even when these basic scientific building blocks have been developed with federal money—because they are aggressively laying proprietary claim to these discoveries in the hopes of earning future royalties.

The NIH was shocked to discover that universities now impose proprietary claims on basic research tools that are as restrictive as those applied by private industry (including requirements that the university be allowed to review manuscripts prior to publication, and provisions extending their ownership claims to any future discoveries.)

Universities, the NIH wrote, “have no duty to return value to shareholders, and their principal obligation under the Bayh-Dole act is to promote utilization, not to maximize their financial returns.”

When universities act in a manner directed at maximizing their financial returns, they also raise questions about their non-profit status? Universities, AFTER ALL, are tax-exempt in large measure because it is assumed they are performing certain functions that will benefit the broader public, not merely their own bottom line.

The consequences of imposing excessive proprietary constraints on information could be profound, especially in an era of expanding intellectual property claims, where there is a real need to preserve the pipeline for future discoveries.

- A recent article in JAMA notes that while the total number of new gene patents has increased from 400 in 1990 to 2,800 in 1999, the universities’ share of gene patents has increased from 55% TO 73%. Before Bayh-Dole, most of this genetics research would likely have been available for free in the public domain.

Expanding intellectual property claims are also leading some universities to clash with their own students over the rights to commercially promising discoveries.

- In perhaps the most remarkable case, the University of South Florida filed suit against a student—Petr Taborsky—who was at work on his master’s thesis. Taborsky, who had been working with his professor on a sponsored research project, claims he received permission from his professor to pursue a separate project pursuing his own research approach. But after he discovered a commercially promising way to remove ammonia from waste water, the company and the University laid claim to his work. The university, in fact, spent ten times the original research grant on legal fees alone. Taborsky was eventually

convicted of stealing university property and, under Florida law, was sent to a maximum security prison! The case rapidly turned into an embarrassing media spectacle, however, leading governor Lawton Chiles to intervene and offer Taborsky clemency.

The Taborsky case is, of course, an extreme example of how proprietary interests can conflict with educational goals. But it is by no means the only one.

In my travels to various schools, I'm afraid I've heard administrators, deans and faculty discuss the growing number of conflicts that can arise in labs where professors are working with students, while also pursuing sponsored-corporate research or trying to operate a start-up company on the side.

So just how successful has all this technology transfer activity been? When universities began launching tech transfer offices on a large scale beginning in the 1980s, many anticipated that this activity would be a big money-maker, generating new funds that could be ploughed back into research.

Much to their dismay, however, universities discovered that running tech-transfer offices and defending intellectual property is actually very costly! The truth about Bayh-Dole, which is very rarely discussed, is that very few schools are actually making any money off of all this increased licensing activity. Looking at figures from AUTM, we see that a large number of schools actually spent more on legal fees—defending their intellectual property—than they brought in from royalties. Most experts believe that at least half of the schools do not even break even.

However, the difficulty in turning a profit, seems only to have made some schools more aggressive. Stanford University, for example, has gotten into launching its own brands (to extend the life of its royalty income beyond the life of a patent); Other schools are spinning off for-profit subsidiaries, such as online-education ventures.

**3: ONE THIRD AND FINAL DANGER LOOMS**, if universities do not retain their autonomy from the market: Namely, that the university's own research agenda—and its curriculum—will become increasingly tied to the needs of industry.

At U.C. Berkeley, many of the students and professors I interviewed expressed concerns that less commercially oriented fields of research will languish as the university tightens relations with industry.

One Associate Dean, who shares these concerns, pointed out that in the past decade Berkeley's world-renowned Division of Biological Control, as well as the entomology and plant pathology departments, have been downsized—or outright eliminated—while money has been poured into molecular biology and other more lucrative areas of science.

We must ask what impact this will have on our nation's research:

- The Division of Biological Controlled played a leading role in pest control in third world countries, saving crops that are a food staple for millions of people.
- And although these ecological and organismic areas of science are not patentable, they have provided enormous public benefit.

At Stanford University, I interviewed several experts on university-industry alliances who noted that universities have historically played an essential role in the public health field as well. The pharmaceutical industry has never been interested in sponsoring research on any number of serious Third World diseases or vaccines, they pointed out, because developing nations cannot afford to pay high prices for drugs. This is the kind of research that universities are uniquely capable of performing, when they are not driven by commercial forces.

**SO WHAT IS REALLY AT STAKE HERE?** In a recent speech entitled "The Privatization of Public Universities," Robert Berdahl, the

Chancellor of U.C. Berkeley, asked whether, as the research agendas of universities and industry blur, “there will be any significant investment in research that is simply in the public interest, rather than the private interest.”

Berdahl, it should be noted, defends the Novartis agreement and believes great benefits can come from university-industry collaborations. But he also fears that market values will increasingly dictate what types of inquiry the university undertakes.

This trend poses a particular threat to the humanities, where research very rarely, if ever, has direct commercial value. As Chancellor Berdahl noted in his speech, “With the new capacity of some faculty—biologists, engineers, computer scientists, and business school faculty—to earn substantial amounts outside the university, there can be a corresponding devaluation of the work of humanists and social scientists.” It is worrisome, Berdahl continued, “that the great challenges posed by the advent of the new technologies... are fundamentally issues of ethics and public policy. Who will guide us through the moral and policy thicket of this new age if the humanists and social scientists are weakened by the overwhelming drive of market forces in a university-industrial complex?”

MORE BROADLY THERE IS THE QUESTION of how much money universities are dedicating to teaching versus how much is going into research.

- From 1976 to 1994 spending on instruction declined by 9.5% at public universities while spending on research increased by 21%
- Over this same period, the number of full-time faculty declined, while the use part-time faculty more than doubled.

The rapid erosion of full-time teaching positions also has a direct bearing on graduate students and the culture of the academy. How can graduate students and young faculty be expected to dedicate

themselves to the academy—where salaries have always been lower than those obtainable in the private sector—if the academy is unwilling or unable to support them at even the most basic level, and provide basic job security?

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In my concluding remarks I would like to address the most important question of all: What do we do about all of this?

Am I proposing that we simply turn back the clock and cut off all ties between industry and universities? No, clearly not. Erecting an impenetrable wall between universities and the commercial sector would neither be wise or realistic. But I do believe that quite a lot can and does need to be done:

First and most importantly, I think the nation's universities should band together and establish collective guidelines that would preserve academic freedom in all their interactions with industry. The reason these guidelines need to be collective is that, otherwise, we risk a dangerous race to the bottom in terms of standards. When one school adopts a more stringent policy on equity holdings, for example, you can't have accomplished scientists and professors running to other schools with more lenient policies.

Unfortunately, universities have not taken kindly to this idea of a collective response. In January, after Jesse Gelsinger's death at U. Penn, the Dept. of Health and Human Services issued "draft" guidelines on financial conflicts in clinical research, and opened them up for public comment. Immediately, all the leading education organizations—including the American Association of Medical Colleges, the Association of American Universities, and the Nat'l Assoc. of State Universities and Land Grant Colleges—wrote to HHS the requesting that the guidance simply be "withdrawn." Rather than offering constructive criticism and working through the government framework, the university establishment was adamant that they would deal with the problem on their own.

The fact is that in the twenty years since passage of Bayh-Dole, universities have been very reluctant to develop conflict of interest policies to address the problems I have laid out in this talk. They have also never adopted any standards collectively. In a recent study published in the JAMA, which examined the conflict of interest policies at 100 universities, researchers found little uniformity, and a remarkable absence of safeguards:

- Only 55% of university policies required disclosures of conflicts-of-interest from all faculty.
- Only 19% specified any limits on researchers' financial ties—such as equity—to companies sponsoring their work.
- Only 12% specified limits on delays in publication.

It is my view that universities need to do better. Here are some recommendations:

- 1) In line with federal guidelines, all universities should prohibit publication delays of more than 30-60 days, and any other editorial constraints imposed by corporate sponsors, such as pre-publication revisions.
- 2) Colleges and universities should require faculty publicly disclose all sources of funding for their research (as well as any related financial ties such as equity holdings, consultant fees, etc.) on all publications. They should also maintain a publicly-accessible database where any one can look up a professors funding sources and other financial ties.
- 3) Dr. Marcia Angell, the former editor of the New England Journal of Medicine, recently pointed out in testimony before the NIH, that institutions must also go beyond mere disclosure and must adopt policies that actually prevent professors from having direct financial ties to companies sponsoring their work. I agree, and would recommend that investigators who receive grant support from industry should not be permitted to have any other financial

ties to those companies (including stocks, seats on boards etc.)  
These kinds of financial ties are not acceptable in the journalism profession, why should it be any different in academia?

- 4) Institutional conflicts are an equally serious problem and I would recommend that universities, themselves, be banned from investing in companies sponsoring their professors' work, as well as other start-up companies founded by their professors. This is a function that venture capitalists and angel investors are far better capable of providing.
- 5) Universities should mandate that their technology licensing offices always work to minimize proprietary restrictions on basic research tools and reagents—so the basic building blocks of science continue to be shared.
- 6) Finally, and most importantly, universities should refuse to tailor either the research agenda or the curriculum to the needs of industry, and make a stronger case for the importance of preserving public support for higher education.

In closing, I would like to stress that even on utilitarian and economic grounds, there is strong evidence to suggest that it would be foolish for universities to allow the research agenda or the curriculum to become commercially driven.

In the spring of 1999, I met with Dr. Paul Berg, a Nobel Prize winning biochemist at Stanford, who was a seminal figure in the biotech revolution, having laid the early groundwork for splicing DNA to make hybrid molecules.

Berg points out that, in its early stages, all of the basic research that led to the biotech revolution was funded not by industry but by the government. Why? Because it did not appear to have any commercial promise, so industry and the venture capitalists simply were not interested in funding it.

Berg stresses that many of the most important scientific breakthroughs—including the computer engineering revolution—resulted from public support of basic, undirected research that yielded unexpected discoveries, some of them with great commercial promise.

So, if we allow universities to become too closely enmeshed with the marketplace, I think that this poses a grave risk not only to the humanities, “public good” research, and the integrity of the scientific enterprise, but to our economy and our future economic prosperity as well.

The University’s independence from the marketplace, in short, should not be thrown away lightly.

Thank you very much.