

IS THE UNIVERSITY IN CRISIS?

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Social scientists, who spend much of their lives in universities and who should know better, are often surprisingly oblivious to transformations of higher education. We should not be, for these central institutional bases of our work are undergoing deep structural changes and the implications are profound. And we should do more than grumble about our changing working conditions. After all, more is at stake, from the basic educational mission of universities to their support for a vibrant public sphere to structures of social inequality. It is no accident that there have been so many sharp external critiques of higher education recently; it is a surprise there has not been more internal debate and research. Social scientists should generate serious analyses of transformations in how knowledge is produced, communicated, and improved in critical debate.

That this is an urgent and not simply a long-term issue is made clear by Jennifer Washburn's forceful indictment of the corruption of higher education in *University, Inc.* An intelligent and concerned journalist, she puts in bold relief issues some specialized researchers have addressed in sustained (but not so impassioned) analyses yet most scholars have ignored. Maybe she will wake them up.

The corruption in question comes largely from the speed with which universities have been restructured by corporate capitalism since the late 1970s—and especially since the passage of the Bayh-Dole Act in 1980. A response to anxieties over declining U.S. productivity and competition with Japan, as well as to the desires of business and some university leaders, this was designed to encourage more patenting of the products of federally financed academic research. Universities long had links to business, but this spurred both a much more basic integration with business and a tendency to operate universities as businesses.

The pursuit of revenues from intellectual property—licensing, for short—became a crucial component in a deep transformation of American higher education. A second was a sharp intensification of hierarchy and related competition over admissions. This came in the wake of an expansion that ended the era in which simply going to college was a mark of elite status. Where one went was ever more crucial, with influential rankings

schemes keeping score for both students and schools. Simultaneously, the market matching students and schools grew more nationally integrated, especially at the elite end. And research grew in importance as a visible measure of “excellence.” Not only did inequality grow, but the extent to which institutional diversity was recognized in any way other than place in the hierarchy was diminished. This helped among other things to drive up costs. The third major component to the structural transformation was the combination of declining state funding, especially of the “flagship” public research universities, with massive tax-exempt transfers of wealth to the benefit of at least a privileged segment of private institutions and higher tuition and fees across the board. Higher costs came with sharply varying levels of financial assistance (also known as “discounting”) distributed less on the basis of need and more on “merit” (measured with test scores and grades that not coincidentally also figured in external rankings).

There is more, of course, but these three components go a long way towards accounting for a transformation in which the costs of higher education have shot up, teaching has been marginalized in many institutions' priorities (if not their rhetoric), and universities appear less as producers of public goods and more as distributors of private ones. Each of the three issues deserves sustained attention. Following Washburn, my focus here is on the first, but it is important to remember that they are connected in the larger story of what is happening to the university. These are reasons why it is hard to explain to the public what universities do and why they deserve public support. Universities do many wonderful things, but as the number and scale of these have grown, so have centrifugal forces, and universities have become less cohesive. Like Washburn, I will also focus entirely on the United States, but it is worth noting that this is not a narrowly local story. Versions of the same issues are reshaping higher education around the world.

Transformation in Scale

The issue of scale deserves attention up front. It lies behind intensified competition, new inequality within higher education, the rising cost of universities, alleged declines in quality, loss of intellectual community, and

a range of other issues. Both the challenges universities face today and their difficulties responding to them are shaped by the specific choices and compromises made in previous decades and too seldom grasped clearly.

Without a dramatic change in institutional and sectoral size, it is unlikely that some of the other changes would have taken place. The issues, in a nutshell, are (a) that universities got much larger, (b) that more or less full-time scientific and engineering research components of universities got much larger, (c) that the higher education sector got much larger, and (d) that partly as a consequence, the relationship of higher education to elite formation changed.

The first two points meant that each campus (or system) had much higher and to some extent less flexible financial requirements. Together with an increasingly complex regulatory environment, that also meant that running universities became more of a management challenge, and the management issues faced were less closely linked to the intellectual and educational projects of arts and science faculty. Flows of students, faculty loads, construction and maintenance of facilities, marketing, and fundraising all called for management by aggregate numbers as much as by substantive intellectual engagement. Admissions, for example, became a matter of computer-assisted optimization of the relationship between revenue projections and academic profile. Development was not the occasional "campaign" but a perennial project. Running a university was like running a big corporation. In fact, running a university was running a big corporation. As a result, top university managers were more and more often drawn from other fields of managerial work, from professional schools, and/or from long careers in full-time higher education administration.

The second two points are as significant, and perhaps better evoked with some simple numbers. Over half the colleges and universities operating in the United States in 1990 did not even exist before World War II. Fewer than 3 percent of the nation's population at the close of the nineteenth century had ever attended college, let alone graduated. By contrast, close to a quarter of Americans have college degrees today and over 65 percent of young adults at least start college; about two-thirds of these graduate. In 1920, only 615 Ph.D.s were awarded in the United States. Today more than 43,000 are awarded each year. The transformation wrought largely by changing scale and opening access has been enormous. Among other implications, whatever else one makes of the relationships of higher education to social class and inequality, one can no longer understand college education as centrally the formation of a social elite. This may be true at Harvard, but

it is not true in general. Institutional differentiation within the field of higher education is elaborate and important if ideologically masked by the awarding of nominally equivalent degrees. Conversely, one cannot understand attacks on "tenured radicals" or advocacy for "intelligent design" as simply projects of the uneducated. Even those suspicious of the intellectual elite have been to college.

American higher education has been predicated not only on large enrollments but on rapid growth; this is among other things a key explanation for the way in which graduate education in the arts and sciences has been organized. Enrollment growth exceeded that in the population at large especially as public universities opened new and relatively low-cost opportunities. To what extent this was mere credential inflation, as Randall Collins has argued, and to what extent social mobility may be debated. But one aspect of the growth was in any case something of a "pyramid scheme" operated by existing faculty and institutions competing for prestige. A dominant position in the field depended on producing and exporting research and faculty members to the rest of the field. Everyone wanted to produce graduate students and journal articles. Like all such schemes, which work so long as new suckers buy in, this one entered a crisis when growth slowed. This happened in and after the late 1970s, though professors continued to demand the "right" to teach specialized courses to graduate students with little regard for the job market those students faced.

At the same time, many of the strongest researchers were less and less engaged in undergraduate education. After all, growth by proliferation of new activities and units—departments, centers, graduate programs, laboratories—was greatest at the research universities. Undergraduate education—and especially engagement in what might knit an undergraduate education together across disciplines and other fields—lost centrality to research universities as these universities proliferated subunits and lost cohesion. And more and more universities claimed to be and tried to structure themselves to be research universities. This has been an important source of external criticism of universities, though many critics have lacked a strong analysis of the structural factors behind the change.

There have been countervailing projects, of course, and efforts at renewal and reintegration of undergraduate education. Residential colleges have been founded to complement large universities; interdisciplinary undergraduate programs have sought to bridge disciplinary curricula. And the patterns in the more elite research universities were not of course typical for the whole system. Because of their dominance in the field,

though, others modeled themselves on them and faculty throughout the system often saw their career prospects shaped more by how well they approximated the productivity of elite research universities rather than how they taught or contributed to local campuses. Moreover, as Jencks and Riesman argued, "professional" disciplinary commitments dominated over "local" institutional engagements. In whatever degree good or bad, this pattern was linked to growth and expansion. It confronts new challenges when growth slows. Enrollments still have demographic momentum behind them, but there is no reason to expect a return to the growth in resources and enrollments characteristic of the postwar period.

American higher education has undergone structural transformations before, and emerged as a still thriving institutional field and perhaps in some cases strengthened. A transformation in the prevailing understanding of knowledge (and accordingly of teaching and other missions) came with secularization and the introduction of research-centered models in the nineteenth century. It not only shifted intellectual practices, it brought a reorganization marked by the rise of the university and a deepened distinction between research institutions and others; the rise of the research degree, especially the Ph.D. as a basic qualification for faculty; and the rise of the modern system of disciplines in place of classical organizations of the branches of knowledge. This still shapes not only how much or little universities engage religion, but also more generally how much or little they engage broad issues of "values" or "perspectives" across disciplines. Indeed, each of these structural transformations has left its mark on the system, and shapes the ways it responds to challenges today.

The postwar transformation was marked most distinctively by expansion of access, though expansion of funding for research was also dramatic, and the proliferation of professional schools and professional degrees important. It was also during this period that large-scale externally funded research became a staple of at least an upper tier of the university system. We have not fully worked through the implications of this transformation. For example, we talk about comparisons between "today's students" and those of our own student days in ways that not only idealize our pasts, but neglect the implications of the shift in the proportion of the population going to college. A change from sending the best educated quarter of high school students to college to sending the best educated two-thirds is more important in lowering mean performance levels of those students than any change in teaching, student motivation, the quality of high schools, or other such factors. Likewise we talk of the faculty as though the profes-

orate had not shrunk as a percentage of the professionals employed by universities. Big science, for example, is only partially a project of "regular faculty" and crucially the employer of many full-time researchers.

Now, I want to contend, we are in the throes of another structural transformation. It has at least equally momentous potential. Indeed, it could so reorganize the different practices and claims to value today bundled together in colleges and universities that it ends the field of higher education as we know it. I think that is unlikely, as it happens, but I think it is very likely that there will be a substantial unbundling of different parts of the conglomerate corporations that many universities have become. It is not obvious that all kinds of research, scholarship, and teaching need to be organized together. Universities provide libraries, entertainment (notably sports), housing, and a host of other goods as well as research and teaching. Research can mean very different kinds of enterprises in the current era, perhaps most importantly with transformation in the financing of scientific and technological research but also because of simple increases in the cost of some kinds of science. An approach to research overwhelmingly defined in terms of commercial or technological usefulness also changes the field, not least by making it hard to maintain the traditional value on scholarship, but also by undercutting kinds of research that may inform the public or enhance judgment of various kinds without yielding technologies, commercial applications, or indeed, services for those with political power. Teaching, too, is subject to internal differentiation and therefore is differently challenged—or facilitated—by new technologies, for-profit organization of providers, and similar innovations.

Contradictions and Compromises

We know a good deal about some pieces of the higher education puzzle—about how well years of education predict income, about factors that shape enrollment decisions, even a growing amount about costs. But we know relatively little about higher education as a whole, as a basic institutional domain in modern American society, as one of the country's four largest industries, if we were to categorize it as such. What we think we know is based embarrassingly largely on personal experience as students and professors, not on research. What research exists is seldom linked to any consistent conceptual framework let alone real theory. This is less true of economics than sociology, but if anything the pattern is worse in political science and anthropology. In any case, sociologists have nothing to be proud of in the extent to which they have studied this basic social institution in recent years. And in neglecting this institution we have, ironi-

cally, failed to be reflexively self-aware, failed to analyze the conditions of our own scientific work.

There are a variety of reasons for the neglect. It has to do with the tacit division of labor between schools of education and arts and science disciplines. It is exacerbated by the sharp turn of the sociology of science away from institutional analysis. It is missing from an otherwise promising renewal of institutional analysis that has been drawn towards analysis of for-profit businesses, partly because of the opportunities business schools have provided for economic sociologists. Indeed, non-academic, nonprofit, and philanthropic organizations have received more attention from sociologists, including those interested in the renewal of "civil society." And in a considerably earlier period, there was much more sociological attention to the university and academic work, with prominent studies by Riesman and Jencks, Parsons and Platt, Blau, Trow, and other central figures in the discipline. Still, virtually none of the major recent books on the nature of the higher education in the United States is by a sociologist (if there is an exception, it is Stephen Brint's edited collection, *The Future of the City of Knowledge*, in which sociologists are well represented or Andrew Abbott's insightful accounts of the organization of fields of knowledge). Certainly Stanley Aronowitz has also contributed a sharp critique of one dimension of change in *Knowledge Factories*. But in general, if sociologists are going to become more aware of and actively engaged with the contemporary transformations of higher education—and their implications for sociology—they are going to be dependent "on the kindness of strangers" including intelligent journalists like Washburn.

This is a distinctively American weakness. Just think of the prominence of studies of the university and professional schools in the work of Pierre Bourdieu. *Homo Academicus* and *The State Nobility* address distinctively French circumstances, but they also offer suggestive guidance on how to approach higher education as a field. The American field is not nearly so closely tied to the state as the French; complex relations to the market and to other parts of civil society—including organized religion—are fundamental. But we need to follow Bourdieu's lead in (a) disaggregating the different dimensions of a highly diverse institutional field, analyzing its internal hierarchies and struggles; (b) analyzing the field as such, including the extent to which it is bounded and the ways in which different institutions relate to other fields of power and resources outside it—not just using the term to evoke some mix of similarity and connection—like sector; and (c) developing a historically rooted account of its structural transformations, past and present.

First, let us think of higher education as a field, in Pierre Bourdieu's sense of the term. That is, it is a constellation of different institutional and individual participants whose practices are organized in relationship to each other and to a distinctive kind of value or capital—knowledge (or perhaps more precisely, the capacity to speak with authority on matters of science and scholarship). There is competition and struggle within the field—and, I would stress more than Bourdieu, there is also cooperation. The field is made possible by the success of its participants in claiming that what they do is distinctive and important and in need of a significant degree of autonomy. The claim to autonomy is crucial. It underpins the notion that members of the field can properly judge each other and claims to the field's distinctive value in a way that outsiders cannot. The field is destroyed if it loses its autonomy, if its special form of capital is reduced to the general operations of economic capitalism or political power.

Second, let us analyze structural transformation as a deep reorganization of the field, changing not only the way in which its participants relate to each other but the ways in which the field as a whole relates to society more generally (to what Bourdieu calls the field of power, though we may want to differentiate further the different claims of economic and political power). A structural transformation need not be an attack. It may be an extension or expansion of aspects of the field in line with its own internal commitments and values. I borrow the phrase from Jürgen Habermas's study of *The Structural Transformation of the Public Sphere*. Habermas establishes the development of a distinctive orientation to politically significant public communication in the eighteenth century, one in which disinterested argument about the public good was distinctively valued. Openness, rational-critical discourse, and influence on the state were important to this public sphere. More of each seemed to mark an advance in democracy. However, according to Habermas, openness and rational-critical discourse proved to be in tension. As the public sphere expanded in scale, the quality of its discourse was debased and it became more vulnerable to mass opinion management through advertising, emotional appeals, and the like. The notion that public opinion should inform the state was also in tension with both openness and reasoned debate as political parties and others began to manage the relationship instrumentally. Democrats must both seek ways for reasoned debate to flourish beyond a narrow elite, and avoid the collapsing of civil society or the public sphere into either state or economy. Not only has the university been a central institution in the public sphere—especially since the

late nineteenth century—it also confronts very similar challenges.

In higher education there are also basic contradictions among ideals held simultaneously:

- Knowledge for all vs. the “best” possible knowledge
- Useful knowledge vs. pure knowledge (technology vs. science, applied vs. basic, training for jobs vs. education for citizenship)
- The universalism and egalitarianism of science vs. the manifest hierarchies in and among actual institutions
- Breadth vs. specialization
- University as a unity vs. more or less separate institutionalizations of disciplines and professional fields.

These contradictions occasion specific compromises in specific institutions, and also a muddled account of higher education to policymakers, funders, and the public. They confuse us, too. But working them out is basic to seeing what transformations are underway and what effects they are likely to have. And beyond the contradictions among ideals are conflicts over money.

Knowledge and Money

Higher education has never been cheap, but it has become much more expensive. Tuition has risen not merely at the rate of inflation, but more or less at the rate of increase in luxury car prices. Of course, tuition is still subsidized at public universities—though states are bearing less and less of the proportionate cost. Michigan pays only perhaps an eighth of the cost of the University of Michigan. Along with a number of other flagship state universities, it is more “state-assisted” than fully “public.” The actual costs are not as high as universities’ “list prices,” but “consumers” are paying more. What they are paying for is not just education, however, or even credentials but prestige and connections—what Bourdieu called cultural and social capital. This is especially true as one moves up the hierarchy of selectivity. Students at for-profit institutions pay fees more directly linked to the costs of teaching and testing. Costs at community colleges and some public institutions are also primarily “educational” in this sense, whatever proportion is paid directly by students or by taxpayers. But these are institutions that confer little added value from prestige.

The quality of teaching may improve as one ascends the ladder from a local community college or the Uni-

versity of Phoenix to Harvard, but it is not clear. Even if this is so, it is far from self-evident that this is the basis for cost increases. On the contrary, costs rise mainly in order to pay for other university activities, notably research (though also sports programs, student activities centers, and attractive campus facilities generally). And students pay in order to reap the benefits of being at more selective institutions—benefits that include the stimulation of presumably stronger classmates, but also prestige and advantageous social networks. Higher education is a market structured heavily by competition for “positional goods,” those that derive their value entirely from relative standing rather than absolute quality. It is a preeminent example of what Frank and Cook called the “winner take-all society.” And it is a market, thus, in which exclusivity is taken as a measure of quality. It is also a market where competition is driven by rankings of institutional “excellence” linked significantly to research. So, ironically, universities invest in research partly in order to be able to turn more students down and improve their overall standing. And how much they spend per student is actually one of the criteria sometimes used to assess their quality!

Standing is commonly reckoned by highly arbitrary but more or less inescapable rankings. *U.S. News and World Report* is the most visible rater of higher education in the United States, and hugely influential no matter how dubious its methods. Moving up or down a few places in its league tables has an immediate impact on applications and acceptances. The *National Research Council* ratings reflect more serious research, but they appear infrequently. Internationally, rankings published by Shanghai’s Jiao Tong University and London’s *Times Higher Education Supplement* play similar roles to *U.S. News*, but even more narrowly focused on research. For research, after all, is among the most immediately measurable academic outputs and relatively readily measured transnationally (though with a premium for publication in English, in international journals, or those of hegemonic countries). Research is important, moreover, not just because it translates into more and stronger students willing to pay higher fees, but because it translates into investments from governments and increasingly private businesses and into philanthropic gifts—tax-exempt donations that tend to follow prestige and personal loyalty more than institutional need or any index of marginal benefit to humanity (the love of which ostensibly defines philanthropy).

Harvard’s endowment now exceeds \$25 billion. On a per student basis, Princeton’s exceeds Harvard’s. And both institutions keep getting richer. In varying degrees, so do perhaps (at most) 20 percent of American universities and liberal arts colleges. This means they can

operate "high tuition/high aid" strategies to secure the student populations they want. Others are increasingly dependent on cash flows from student fees or remain dependent on state subsidies that are now flat or declining. In essence, there seem to be three viable "subsectors" within higher education. First, there are the institutions that can be highly selective in their students and can compete effectively for research prestige. These are mostly private, and generally benefit from endowment wealth, but some of the best public research universities remain in the group (though often by operating more and more as though they were private). Second, there are institutions that operate on a fee-for-service basis, whether directly as for-profit institutions or as nonprofits with highly commercial models. These range from Phoenix and DeVry to the many small colleges that once taught mainly liberal arts subjects and now offer mainly career-focused degrees from business and computer technology to criminal justice and dental hygiene. Third, there are publicly subsidized institutions that provide low to medium prestige education at lower than private market cost to a student population over which they can exert relatively low selectivity. These range from community colleges to what the Carnegie classifications have called comprehensive regional universities.

There are a range of different senses, thus, in which the higher education field has become more commercial. The reformulation of scientific knowledge as intellectual property is primarily an issue for the upper tier, the first of the three subsectors described in the previous paragraph. But of course, it also challenges the ethos and practice of science generally and contributes to further changes in the larger field.

University, Inc.

What the Bayh-Dole Act symbolizes, and has helped to further, is a pervasive new approach to knowledge as intellectual property. As Washburn documents, many of the purposes behind Bayh-Dole were benign. There was hope that a variety of human benefits would follow from turning science into technology faster, and that universities would be able to use new revenues to seed more scientific research. Of course, the act was passed in response to concerns for global economic competitiveness, and it was always expected that capitalist industry would benefit. It was not, perhaps, fully anticipated how much it would encourage universities to adopt capitalist strategies themselves.

The basic "gift" Bayh-Dole offered was the right for universities to patent federally funded research on a large scale. Previously, the products of research paid for with public money had been in the public domain.

The idea was that making them private property rights would encourage both scientific research itself and especially a more rapid process of developing useful products based on that research. It was taken for granted that benefiting business would benefit the public because business was the best way to develop and market new products. Universities would benefit because they would earn royalties on licenses and because firms would invest in academic research. Indeed, Congress followed up Bayh-Dole with legislation giving tax breaks to firms that did so and making much federal funding conditional on corporate matching grants. Since 1980, industry funding for academic research has indeed grown dramatically—by at least 500 percent.

What's wrong with this? Perhaps more in practice than in principle, because there have been very weak safeguards, major decisions made on exaggerated hopes, little critical examination and less translation of this into closer oversight. As Washburn notes, "...throughout the modern era, professors have received funding from private corporations and have performed research that helped spur industrial development. What's truly new—and dangerous—is the degree to which market forces have penetrated into the heart of academia itself, causing American universities to look and behave more and more like for-profit commercial enterprises." Of course, much of this might have occurred anyway, as, for example, Richard Nelson has argued. Bayh-Dole is perhaps less a root cause than a symbol and a reinforcement.

Indeed, Bayh-Dole was passed partly because there were a number of university patent officers—in an organized lobbying group—eager to expand their opportunities. During the postwar era, the federal government had become a primary funder of many lines of scientific research that promised potentially marketable products; to have these in the public domain meant that it was hard for any one university or business to profit enough to take on the development that would turn research into a marketable product. As Washburn summarizes, "the more vested the universities became in negotiating lucrative licensing deals with private industry, the more they resented federal policies that restricted their ability to privatize publicly funded research." So they organized to lobby Congress—and universities spend more money on lobbying than do businesses in the defense industry.

That the payoffs might be huge was suggested by the success of Stanford and the University of California at San Francisco when they patented a crucial technique for gene splicing, an exciting early step in development of recombinant DNA. The two researchers who would be associated with the patent for the gene splic-

ing technique, Stanley Cohen and Herbert Boyer, had done their research without specific expectation of extra-scientific reward. They were persuaded by Stanford's patent administrator to make an application. This was controversial at the time for three reasons. First, many researchers had contributed in various incremental ways to make the new technique possible, but the patent recognized only two and rewarded them and their institutions as though they had done the work in isolation. Second, much of the research had been paid for by the federal government, which might be considered to establish a public claim to what a patent would render private intellectual property. Third, the discovery was of an extremely basic nature, a broad platform technique that enabled many other processes—not in and of itself a product for end users. Indeed, Cohen and Boyer were themselves initially skeptical. They were brought around, as Washburn reports, by the argument that only with proprietary protection would drug companies be interested in developing products—like recombinant insulin. So the application was made, the patent awarded, a modest licensing fee charged, and Stanford and UCSF shared some \$300 million.

Bayh-Dole was intended to replicate this sort of success. But there have been only a handful of comparably lucrative innovations—though there have been thousands of patents. What ensued was a massive chase after intellectual property—which was driven at least as much by university attempts to sell themselves as by any demand from private businesses. Though, of course, there were buyers. In some of the most controversial of these arrangements, universities entered into “pre-emptive partnerships,” selling corporations first rights to future innovations. The most famous of these deals linked the University of California at Berkeley to the Novartis Corporation, a Swiss pharmaceutical giant with a large agricultural division and an interest in genetically engineered crops, and therefore a desire for preferential access to research in the Department of Plant and Microbial Biology in Berkeley's College of Natural Resources. This upped the ante on previous university-industry partnerships. It led to considerable controversy, both about what it would mean for the work and careers of students and faculty in the department and about the possibility that important contributions the College might have made to the public would now be privatized.

Despite assurances, it was not clear that safeguards were in place either to protect the university's or the public's interests or to ensure that “academic values” were upheld. The worry about student and faculty careers was reinforced by a variety of suspect dealings, including a university oversight committee that made

grants of Novartis money to its own members. More dramatically, a faculty member who became a vocal critic of the Novartis deal was denied tenure—despite initially favorable reviews. It didn't help his case that his research also raised serious questions about the ability to contain the spread of genetically modified plants. The faculty member in question, Ignacio Chapela, eventually won tenure following an appeal (completed only after Washburn's book went to press). The university's reputation for independence and a priority on intellectual values was not advanced.

Whether the public interest was advanced is doubtful. Asked to explain the tension between the public investment in the University of California and the private sale of rights to its scientists' work, Berkeley administrators fell back on an increasingly widely used formulation. Berkeley was not so much a state university, they suggested, as “state-assisted.” The phrase will be familiar to those watching the University of Michigan, the University of Virginia, and others.

In the end, one of the most telling features of the Novartis story is that the firm made no money on the deal. Indeed, its agricultural division was merged with another company to form Sygenta, taking the Berkeley deal with it. If the Berkeley-Novartis deal was unusual in the amount of controversy it generated—partly because Berkeley is a campus with stronger than average faculty engagement in self-governance—it was not unusual in failing to generate profits. While a few universities have made the patenting of research and technology an effective and lucrative operation, many more have failed. Stanford secures 80-90 patents a year, but most universities' technology transfer programs do not even break even. Universities collect about a billion dollars a year from commercialization of drugs, software, and other academic inventions, as Washburn reports, but two-thirds of this goes to just thirteen institutions. And even in these cases, few can claim a steady flow of successes across a range of different scientific research programs. Most have just scored one or two big and relatively arbitrary hits—like the University of Florida with Gatorade or Florida State with the cancer drug Taxol.

Despite this, there are plenty of new entrants seeking to catch-up to the stars in the technology transfer game. These are largely universities trying desperately to fight their way into the top tier of the ever-more-competitive hierarchy of American higher education. Whether it is a good investment strategy is uncertain. Whether it is part of a significant change in how universities are organized is not.

This is so not least because of the large proportion of public research universities among the schools try-

ing to catch up in the technology transfer game. These are responding to declining state support and to the endowment edge of private universities. In a number of cases, states are also trying to do "technology-based economic development on the cheap," as Washburn quotes Irwin Feller. While holding university budgets flat, or even making cuts, they are targeting a few high-tech initiatives, often those of special interest to certain industrial groups in the state. If they don't score "big hits" fast, this risks eroding the universities' research and teaching capacities over the long term. It adds to the large pressures on the public research universities, only a few of which are likely to remain major intellectual forces.

At the same time, though, the rush to patent restricts access to a good deal of knowledge, and to techniques that are important to future research. In Washburn's words, "the walling off of basic, embryonic research behind an exclusive license that isn't absolutely necessary imposes serious, long-term costs on the research community—and the broader economy." Here "public goods" are privatized not only in the broad general sense of the term, but in its more technical economic sense of "non-rivalrous" goods that may be used by multiple parties without being depleted. Some techniques can be used in a wide variety of noncompetitive scientific research projects. Or, to take another of Washburn's examples, patents can be issued that are ludicrously broad, giving property rights not only where they do not belong but in ways that impede future research. After scientists at the University of Wisconsin succeeded in deriving stem cells from rhesus monkeys, for example, the University secured a patent covering all lines of embryonic stem cells for primates! Wisconsin promptly decided not to make the cell lines openly available for medical research, but to license them exclusively to the Geron Corporation (though after political pressure the university withdrew some of its cell lines from Geron's exclusive control).

Here a basic problem is that Bayh-Dole does not recognize the difference between exclusive vs. multiple licenses of non-rival goods. It is one thing to suggest that universities and others deserve to benefit from their work (though if that was itself paid for by the federal government there may be questions about who should benefit). It is quite another to suggest that maximizing profits should be the universities' primary goal—the only real reason behind exclusive rather than multiple licenses.

Here we reach a basic issue: how clearly are universities and scientists subordinating the potential revenues from commercialization to less pecuniary intellectual, educational, and public interests? In Washburn's view,

"universities, both public and private, have evolved into 'public trusts' that were deserving of extensive government support and tax exemptions because of the indispensable civic functions they performed." This conception, and its rationale for resources and privileges, is challenged when universities act primarily as allocators of private goods. Yet, says Washburn, "our nation's leading universities are behaving in ways that suggest money is what ultimately guides their decision-making." Here I would qualify her point only to suggest that it is not simply short-term cash flows from commercialization that are driving universities, but their commitment to competition in a hierarchy in which research standing is a primary factor. Either way, there's a pretty basic issue. In her words again, "one of the principal reasons U.S. taxpayers subsidize academic science so generously is to preserve a unique public research culture, where scholars are free to conduct investigations far removed from any immediate commercial application, such as blue-sky inquiry, risky experimentation, disinterested science, and public good research."

Of course, we may doubt whether taxpayers, including the sociologists among them, really know why the government subsidizes academic science, or how much, or that it has changed some of the rules. But we should, both to make sure we get out public money's worth, and to understand what is happening to science and the university themselves.

For example, one of the implications of the tilt towards potentially profitable fields is a proportionate decline in the prominence of the humanities and social science faculties within universities. The growth of professional schools had already eroded the centrality of the arts and sciences. The rise of "big science" and engineering further shifted the financial center of gravity of leading research universities. And the pursuit of commercial partnerships and income accentuates this. One might think that "a rising tide lifts all boats" and therefore that the humanities and social sciences benefit, but just not as much. This may sometimes be true, though even so the loss of centrality would not be insignificant. But the changes in funding sources have been accompanied by a new social organization of financial accounting—often with profit centers and cost-recovery programs reducing commitments to the common good of the whole university (a development David Kirp describes with telling case studies in *Shakespeare, Einstein, and the Bottom Line*). Within universities as well as in various external arenas, moreover, there is a tendency to privilege the tracking benefits only in dollars and proprietary deals—one kind of indicator, but one that underestimates other kinds of contributions universities make to the public good.

One of Washburn's favorite examples is the lack of disinterested reviewers in fields like pharmacology. How can one insure the integrity of scientific publications, or the federal grant review process, or the testing of new drugs if every researcher is on the payroll of one or more pharmaceutical company? And what is going on with bizarre twists on the ideals of science (and the public sphere) when self-interested scientists challenge the notion that their financial interests should be revealed, writing like Harvard's Kenneth Rothman that "policies of mandatory disclosure thwart the principle that a work should be judged solely on its merits." Mandatory disclosure of financial ties to the producers of drugs on which scientists report, Rothman thinks, is a form of academic "McCarthyism." His argument makes little more sense than saying that cash gifts to politicians need not be disclosed because that would violate the principle of judging political arguments on their merits. And what are we to make of the cases Washburn cites where university-based scientists have allowed corporate sponsors to actually write allegedly scientific papers to publish under their names?

Most sociologists will remember Robert Merton's famous account of the "ethos of science." Science, Merton suggested, demanded of its practitioners: communism, universalism, disinterestedness, originality, and skepticism. He later added humility. Merton in the 1930s, was acutely aware of the threats that fascism posed to the autonomy of science. Merton knew, of course, that the ideals summarized in his account of the ethos of science were subject to less than complete realization. But in his later work on the reward system of science, he sought to describe how the field was organized so that rewards were indeed distributed to those who produced genuine scientific advances and shared them in accord with the ethos of science. It should be said that most of Merton's actual research focused on pre-academic science—often an aristocratic undertaking—and most of it on the elite of scientists, the sort for whom honors like eponymy were meaningful. He probably underestimated the more mundane institutional reward system of everyday academic science—where rewards like tenure, promotion, and pay increases were not insignificant. These could still be allocated more in accord with the ethos of science and less on other bases, of course, but it is worth taking care to recognize that academic science was not altogether pure in some earlier golden age.

Nonetheless, the Mertonian ethos was meaningful—if never perfectly followed—and it is under challenge. The pervasiveness of commercial claims to intellectual property rights within universities is among the basic challenges. Merton, indeed, wrote that "the commu-

nism of the scientific ethos is incompatible with the definition of technology as "private property" in a capitalistic economy." He didn't mean that science couldn't thrive until the Marxist revolution (nor was he naïve about what happened to science in most communist countries). What he meant was that there was a necessary tension between the way science was internally organized and the way the capitalist economy worked. This was managed by preserving a certain autonomy for science. It demanded resources and it produced technological wonders, but it would be destroyed by reduction to a mere economic operation seeking marketable technologies.

The British physicist John Ziman treated Merton's account as plausible for a previous era of academic science, but suggested that era had passed and the idea of autonomous science lost its purchase on reality. In place of the norms that gave Merton's ethos the acronym CUDOS (communism, universality, disinterestedness, originality, and skepticism), Ziman argued that science was governed by PLACE. It was, in other words, proprietary, local, authoritarian, commissioned, and expert. The ethos of applied, nonacademic science ruled by the end of the twentieth century, suggested Ziman, even in universities. But, he suggested, good science could still be done.

In a similar vein, the American sociologists Walter Powell and Jason Owen-Smith have argued that the distinction between universities and various kinds of nonacademic research institutions has declined. Washburn quotes Powell and Owen-Smith, but with the accent on the negative side of this. They would stress that there are strong positives. Many scientists find corporate laboratories more congenial than university ones—even in some cases, more affirming of parts of the Mertonian ethos of science. After all, sharing an economic interest in the profits of the firm as a whole can be a basis for greater "communism" and disinterested sharing among scientists within the firm than the hoarding and suspicion universities often engender by pitting colleagues against each other in competition for scarce rewards.

But there are big questions about what kind of ethos—and social organization—of science can prevail in a world of pervasive intellectual property rights. These concern not only the extent to which science does or does not serve the broader public good (which Washburn stresses) or questions of its cost and embeddedness in a competition among universities (which I stressed earlier). They also concern the internal communication among scientists. Are researchers withholding information from each other more than in the past (as Washburn suggests)? This is not only a question about informal

sharing among colleagues. It is also a question about publication. If the primary goal of research were to produce marketable products, and the primary reward system of science were to be financial gain, then it seems unlikely that scientists would publish as much of their research or as early in its development as has become normative. Already, there are declines in the proportion of publications that are peer reviewed (largely for other reasons). But if there is a decline in publication itself, this will deeply undermine the public communication that enables science to be a self-correcting enterprise—one in which critical re-examination of the work of others drives forward the knowledge creating project as a whole.

What to Do?

In the end, Washburn's proposals are surprisingly modest and focused on eliminating conflicts of interest and abuses of federal funding: (1) licensing should be handled by a third-party board, not direct negotiations between universities and firms, (2) the Bayh-Dole Act should be amended to clarify that its intent is to promote widespread use of taxpayer-funded research rather than maximization of short-term profits, (3) strict conflict-of-interest laws should be enforced on all federally funded research, and (4) a new federal agency should be created to administer and monitor industry-sponsored clinical drug trials. Such proposals would go some distance toward reducing the kinds of problems she cites, but they don't address the fundamental issues underlying her narrative.

Among the most fundamental of these is whether either science or the university can sustain the autonomy needed to function effectively. Such autonomy need not be complete. On the contrary, it is important that any institution be accountable in various ways. Universities cannot expect to be well funded and face no performance pressures. Scientists cannot expect massive resources without questions about "to what end?" and "for whom?"

As Washburn notes, the autonomy of the university was challenged from the left thirty some years ago, in the hope that science and higher education could more directly serve agendas of social justice. It is challenged today by advocates of teaching "intelligent design" alongside evolution, as well as by market forces. It was challenged by both fascism and communism in earlier eras. And it has been challenged repeatedly by donors and philanthropic funders who believe they know clearly how their donations should help humanity. Scientists who think they should simply be exempt from all this are naïve. They also often suffer from the assumption that because they did well on tests and in their

studies they are entitled to their positions of privilege and relative autonomy.

Scientists have invited these challenges to their autonomy by taking it for granted, by failing to communicate science well to broader publics, sometimes by abusing the privileges relative autonomy offered, and often by violating the very ethos of science itself, notably by complacently imagining that academic titles and other honors could earn one an exemption from criticism (or, as Merton put it, "organized skepticism"). But scientists have also invited challenges when they allowed the accumulation of the tokens of knowledge (articles, citations, and honors) to supersede engagement with each other (and with students) over the meaning and significance of that knowledge.

Academics have also invited challenges to the university by treating it as their preserve by right rather than a public trust. Many have benefited from a star system, from the security tenure awards the senior at the expense of the junior, from reduced teaching loads in order to publish research (and job mobility on the basis of research publications), from the chance to employ graduate assistants however long these spend in graduate programs and whether they find good jobs or not. And so they have looked the other way from the increasingly hierarchical organization of the university system, its dependency on ever-increasing funds, its uncertainty of purpose, and its lack of meaningful criteria to judge performance. Indeed, they have even implicitly thought it a good bargain to leave running the university to full-time nonacademic administrators, reducing the "unproductive" meetings on their calendars, allowing academic self-governance almost completely to lapse (especially above the level of the department) though reserving the right to whine.

They have fought for personal benefits in ways ultimately at odds with the values and perhaps even the survival of the institutional field as a whole. Historically, for example, as Washburn notes following Paul Starr, America's medical schools served as standard bearers for the medical profession, helping it achieve recognition as a true profession based on science rather than a business exploiting the suffering. Today the idea of a research hospital is as likely to connote neglect of patients and pursuit of suspect funding as it is the specialized expertise to deal with problems untreatable a generation ago. But sociologists take note, this is not just about the more expensive sciences. How much do those *American Sociological Review* (ASR) articles contribute to (a) human welfare, and (b) teaching? And if the answer is something significant, ask the question for research published in the third and fourth tier journals of the field?

In short, universities and scientific fields have lost some of their autonomy for reasons, not simply by chance or external conspiracy. We have not upheld our side of the implicit bargains as well as we might. Some of those 1960s and 1970s challenges from the left were justified. So are some of the criticisms from the right today, and some of the pressures from the market. The university is sometimes a stultifying environment when it should be creative and exciting. Outside pressure should be a stimulus to change that. Unless it is too late. Or unless those with the power to act aren't paying attention because they are too privileged.

But, of course, all this is not happening uniquely in universities. Quite the contrary, academics are merely among the more surprised (perhaps because longer-buffered) of the many members of established institutions who confront the new social trend of marketizing everything. Call it neo-liberalism. It is basically a collapsing of semi-autonomous social fields into markets. But these are hardly always "liberal" markets; they are often organized by substantial inequalities of power. And the ostensible "liberalization" is often accomplished by state action and even accompanied by state subsidies—as the marketization of academic research extends both federal funding and tax exemptions to the pursuit of private profits.

Washburn's book is written as an outraged response to betrayal of what she takes to be key and once established ideals. These include disinterested research, a focus on the public good, open access to knowledge, and probity in relations between advisors and graduate students. All are under challenge, and there are indeed new financial pressures and incentives behind the challenges, but we should be cautious about idealizing the past. Things can get worse without having been completely good. As I have suggested, in many ways the university created the conditions for its own crisis—and academics for theirs. Not least, we have allowed universities to be much more deeply devoted to reproduction, including the reproduction of hierarchies, than to either the excitement of discovery or the satisfaction of public service.

Let me stress: I find Washburn's account persuasive. I have little doubt these problems exist. But I think they are exacerbations of problems long endemic in academic life, the results of new compromises between long-clashing ideals and interests—and indeed among ideals that are themselves contradictory.

The field of academic production anchored by the modern university has never been free from struggles over professional closure vs. public engagement, over control of the capital that forms both the resources and the rewards of research, over what those who pay for research—or scholarship or teaching—are entitled to de-

mand. Just as ideals clash and claims some recognize as legitimate are challenged by others, so there are all the ways in which academics like others fall short of acknowledged norms: advisors exploit graduate students; scientists are careerist; a host of material interests shape the apparently idealist pursuit of knowledge. From Newton to Crick and Watson the annals of science suggest something other than simple disinterestedness is at issue.

I stress this because I think it is important to realize there is no easy return to some earlier, better version of the university, and because it is crucial to analyze the structure of the academic field into which commercial enterprise has entered in new ways. If we imagine a simple transition from disinterested to interested behavior—from altruism to pecuniary gain—we misrecognize a more sociologically interesting reality in which the question is how interests are shaped and organized. When and how, as both Robert Merton and Pierre Bourdieu (in their different ways) asked, is the field of science successfully organized so that only by pursuing the stakes of sound knowledge—truth—can participants prosper and gain the other resources and rewards they value?

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