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When I was at Brown University, I welcomed each new class of students by citing Richard Sheridan, whose late-eighteenth-century play, *The Critic,* has one of my favorite lines about the paucity of independent thinkers. He wrote, "The number of those who go through the fatigue of judging for themselves is very small indeed!" I urged students to undergo this necessary fatigue and to resist pressures to conform from teachers, peers or those with simplistic political or religious catechisms promising to provide instant solutions to complex problems. I told them that their own thoughts, convictions, beliefs, ideas, and principles—their identities and their characters—are their most precious possessions. Change them if you must, I said, but do not abdicate your intellectual prerogatives, your independent thought, and free will. And please, please, be neither victims of cynicism and nihilism nor passive adherents of so-called political correctness. That trivializes, marginalizes, and ignores our society's real issues and challenges, including poverty, racism, sexism, discrimination, and injustice.

The university has long provided a place to undergo the "necessary fatigue of independent thought." Thomas Jefferson saw universities as sanctuaries of ideas, where, he said, "We are not afraid to follow truth wherever it may lead, nor to tolerate any error so long as reason is left free to combat it." Today our colleges and universities, these vital "sanctuaries of ideas," face at least six major challenges:

1. The information-glut (hereafter referred to as "info-glut") and the fragmentation of knowledge;

2. the curriculum crisis, including the liberal arts;

3. the commercialization of research;

4. the evolution of a two-tier system of faculty, with full-time and part time members;

5. concerns about quality, especially in schools of education; and

6. the changes that distance learning and e-learning may bring.

Failure to answer these challenges will transform our society and threaten our democratic republic.

The Information Challenge

The first of these challenges, impacting all others, is that our world is overwhelmed with information and "underwhelmed" with knowledge. This is an old problem, grown worse, as Neil Postman reminds us in his "Informing Ourselves to Death." He maintains that the Information Age really began "in the late 15th century when a goldsmith named Gutenberg, from Mainz, converted an old wine press into a printing machine, and in so doing, created what we now call an information explosion. Forty years after the invention of the press, there were printing machines in 110 cities in six different countries; 50 years after, more than eight million books had been printed, almost all of them filled with information that had previously not been available to the average person."[1]

The Information Age, now the Information Revolution, parallels the Industrial Revolution in its impact and far-reaching consequences. It is extending our brains and imaginations into the deep unknown with computers and the World Wide Web. Information of all varieties is speeding toward us from all directions. We are bombarded by fragments of information without much context. T. S. Eliot could have been describing aspects of the twenty-first century when he wrote to the effect that hell is a place where nothing connects with nothing. Elsewhere, he also asked two important questions: "Where is the wisdom we have lost in knowledge? Where is the knowledge we have lost in information?"

The glut is very real. More information has been created in the last thirty years than in the previous five thousand. Given this amount of information, English astronomer Sir Martin Rees says, "It's embarrassing that 90 percent of the universe is unaccounted for."[2] According to a 1984 estimate, at least a thousand books are published internationally every day, 365,000 a year. We are

told that the total amount of collected information doubles every five years, yet some investigators believe that we are unable to use 90 to 95 percent of the information that is currently available. For example, Internet search engines can give you hyperlinks to well over 20,000,000 web sites pertinent to the term "Information Age."

In his book *Information Anxiety,* Richard Saul Wurman notes that all this information is tantalizing, but very frustrating. He writes: "We are like a thirsty person who has been condemned to use a thimble to drink from a fire hydrant."[3]

The Information Revolution puts a great burden on the educational establishment to provide some kind of intellectual coherence, connections with our past, our present, and our future. Today, however, our universities are themselves prodigious information machines and, unavoidably, contributors to the info-glut. Two overlapping trends worsen this problem: First, there is, by necessity, an increasing importance of the specialist, and this specialization is accelerating the fragmentation of knowledge in all academic and professional fields; and second, there is decreasing respect for the generalist and, I believe, a consequent decline in our society's ability to provide coherence and synthesis. Universities face a major challenge in refining their philosophies of education and the structure of their curriculum.

Clearly, in an age of extraordinary specialization and fragmentation of knowledge, we cannot abandon specializations or subspecializations or even sub-subspecializations. After all, the division of labor has greatly advanced the cause of civilization. Specialization is an instrument of progress. Complexity, by necessity, requires specialization.

So we need specialists. But for greater understanding, we also need generalists trained in the humanities, sciences, and social sciences. The challenge is to provide synthesis. We need to create a common discourse, a common vocabulary among the various disciplines. We need to rethink the way we pursue knowledge and education, and this means we need to reorganize the content of the curriculum to give coherence to our specialized and fragmented base of knowledge. More than ever, then, liberal arts is necessary as one of the remaining tools of general education, interdisciplinary education, and multidisciplinary education that bring science, the humanities, social sciences, and arts together.

The Technical and Preprofessional Challenge: The Curriculum Crisis

A second, related challenge arises from the growth of technical and preprofessional education. To survive and prosper in an Information Age, we must try to balance technical studies with general and liberal education. When Oliver Wendell Holmes was a professor at Harvard in 1872, he commented on this need for balance, saying "Science is a first-rate piece of furniture for a man's upper chamber, if he has common sense on the ground floor."

In this balancing endeavor, I believe that institutions of higher education are losing ground. We witness the extraordinary growth of technical and preprofessional studies at the expense of the sciences, humanities, and social sciences—in short, true liberal arts. In 1970, 50 percent of the baccalaureate degrees awarded were in a liberal arts discipline, including the sciences. By 1995, that percentage had shrunk to about 40 percent, and about 60 percent of the degrees were in preprofessional or technical fields. The largest number of bachelor of arts degrees granted in the 1990s were in business. For the most part, people in the technical and preprofessional schools and those in the liberal arts schools exist in separate worlds on campus, in complete intellectual isolation.[4]

We must remind ourselves that the value of a liberal arts education and education in general is to enhance people's powers of rational analysis, intellectual precision, independent judgment, and mental adaptability. After all, a proper and balanced education is neither a passive act nor an end in itself. It is important not only to be able to engage in new ideas, but also to be willing to make public declarations of one's convictions and one's commitments—and then to be able to translate them into written words and action. Education must make us more than well-ordered puppets in the passing show, making gestures with no sense of the significance of the human drama, moved only by the strings that tie us to material things.

The experience of attending the university—and here I mean the broad sweep of the enterprise,

from a large research institution to the community college—must make students familiar with the best our culture has taught, said, and done—as well as the dead ends and aberration—that clutter our history. Education must help us understand the sweep of our culture, the achievements, the problems, the solutions, and the failures that mark our history. This kind of knowledge is critical to our understanding of who and what we are. A proper education must serve as a tool of enlightenment. It can be an instrument for enhancing individual as well as collective self-determination. It can provide liberation from political, economic, and social ills. It can help us understand the American polity—which is no small task in our pluralistic and multicultural society that allows the unique to participate in the universal without dissolving in it. Finally, this kind of education serves as the vehicle of American democracy as well as its engine, providing a powerful way to tackle our country's unfinished agenda. After all, education promises every sort of advancement to those who, on the basis of their sex or race or age or disability, have not been able to partake in the benefits of our society.

A liberal education is needed to integrate learning and provide balance; otherwise students will graduate into a world in which dependence on experts of every kind will be even more common than it is today. With that trend comes an even greater temptation to abdicate judgment in favor of expert opinion. Unless we help our students acquire an identity, they will end up not just dependent on experts but at their mercy— or at the mercy of charlatans posing as experts. If students' knowledge is limited to their subspecialized area, they are vulnerable in most aspects of existence. It is the equivalent of dressing a child in the warmest hat possible—but no other clothing—and sending him out into a snowstorm.

As a people, we need to understand where we were, where we are, and where we are going. Without liberal arts to provide a context for technical training, young people cannot be expected to understand the general nature and structure of our society, the role of the university, the necessity of academic freedom, or the importance of values—all their education will have no ethical, moral, or societal context. There will be confusion. On campus, for example, freedom will be confused with license, and tenure will be confused with job security.

The Commercialization of Research

I fear the University's unbridled search for financial stability and new revenues is at the heart of the challenge. Just as students are drawn to fields that seem to promise lucrative jobs, much of higher education pursues grants and contracts wherever they may be. Just as the university is bending its educational mission to meet the demands of specialization and the job market, so too is the university's research being pulled out of its orbit of free inquiry by research contracts from industry and business.

Universities find themselves competing for business investment as federal and state support for research shrinks. The loss of public support prompted Mark Yudof, president of the University of Minnesota, to wonder—in print: "Is the Public Research University in America Dead?" Between 1986 and 1996, he noted, state spending on higher education fell 14 percent, with universities losing budget share to other priorities, including prisons and healthcare. Similarly, federal spending on university research declined for more than a decade, even as the cost of research has risen rapidly. But in the last two decades, industry-funded university research grew an average of about 8 percent a year, reaching $1.9 billion in 1997. By comparison, federal support for university research was softening, falling to $14.3 billion by 1997.[5]

As the nation's pioneer in basic research, the university faces a difficult challenge. How can it maintain leadership in pure research if distracted by research for the marketplace? In the past, the university's challenge was maintaining independence from federal regulators; the current challenge to academic freedom in research is to keep some degree of independence from industry and business. As James Bryant Conant, one of Harvard's illustrious presidents, once wrote, "There is only one proved method of assisting the advancement of pure science—that of picking men of genius, backing them heavily and leaving them to direct themselves."

Clearly, the increasing commercialization of university research has the potential to be a

corrupting influence whenever economic necessities force faculty to surrender prerogatives. Industry sponsorship of university research, after all, can affect the faculty's research agenda in ways that directly and indirectly discourage pure research in favor of research with commercial applications. The challenge for the university is to balance theoretical and practical research—and to protect the individual rights of the faculty, the collective rights of the university, and the integrity of research.

This, again, is a question of balance, because university research always has mixed the theoretical with the practical. As Yudof reminds us, university research brought us the sound motion picture, artificial joints, the pacemaker, Teflon, earthquake-resistant buildings and countless other practical inventions.

The challenge is for universities to maintain their integrity, even as the lines between industry and university research are blurring. A controversial example of this is the alliance created between Novartis, the life-sciences company based in Switzerland, and the Department of Plant and Microbial Biology at the University of California at Berkeley. Since 1999 the company has been paying the department $5 million a year for the right to license a portion of what the researchers discover. Some say this funding will strengthen the department; others worry that research with less commercial potential will inevitably be phased out. No matter what does or does not happen under the glare of publicity at Berkeley, the contract may set a bad precedent. As Clark Kerr, the former president of the University of California system, once commented, "At a place like Berkeley, the situation is much more likely to go well than it would at lesser places, where faculty aren't as sure of themselves. I'm much more concerned about Novartis 2 and Novartis 3."[6]

The Part-Time Faculty Challenge

If the faculty is the core of the university, as I firmly believe it is, then it follows that the university is only as strong, or as weak, as its faculty. Anything that fragments or diminishes the faculty also fragments and diminishes the university. Hence the widespread trend toward part-time faculty threatens to undermine the strength of the university.

Today at most institutions of higher education, most newly hired teachers are either part-timers, adjuncts, or graduate students. Administrators rely on these part-timers to reduce class sizes and to teach more subjects at more times, including nights and weekends. The growth of part-time faculty nationwide has been phenomenal, nearly doubling between 1970 and 1995, from 22 percent of the faculty to 41 percent. What this figure suggests is that in many institutions, the majority of faculty members are part-timers. The percentage of part-timers also has continued to edge up, and part-time faculty teach about one-quarter of all college courses. Although an estimated 85 percent of part-timers are not eligible for tenure, they are not temporary workers. Part-timers work for the same institution for an average of 5.4 years and teach an average of almost two classes in each enroll-ment period.[7] This reliance on part-time faculty reduces university costs—a major goal—because part-timers, adjuncts, and graduate students are paid a small fraction of what tenured faculty earn for a similar amount of work. As the PBS documentary that is this book's companion notes, most freshman English classes at the University of Arizona are taught by graduate students. That practice is, unfortunately, becoming the rule, not the exception.

Unfortunately, the university's shortsighted gains may cause long-term losses. Universities cannot afford to have a growing underclass of part-timers in the ranks of the faculty. The plight of part-timers is all too well documented, but Bryan Konefsky helps personify the trend. He teaches five classes in film and video at the University of New Mexico. He has worked at the university since 1996, but his rank is adjunct and he earns less than half of what his tenure-track peers earn. "In many ways it's a class system, and we're the untouchables," he says. He makes ends meet by doing freelance work and relying on his wife's health insurance.[8]

Let's be frank: Part-timers are piece workers, often paid just a few thousand dollars per course. Few are paid for any academic research they conduct. When a class is canceled for lack of enrollment, which can occur a few weeks into the semester, adjunct instructors may not be paid. They typically receive no benefits, do not have the use of a computer or office, and, in some places,

are not even allowed to buy an on-campus parking permit or have their names listed in the campus phone directory. This is the employment market into which universities are sending their newly minted PhDs.

If this is how the nation's universities treat their recent graduates, how long will it be before graduate school enrollments wither away? The lack of opportunity for tenure-track positions is already maiming the liberal arts. Consider one indication of this problem: Between 1990 and 1995, 55 percent of the 7,598 PhDs who graduated in English and foreign-language programs could not obtain full-time, tenure-track positions during the year they received their degrees, according to the Modern Language Association of America.[9]

In her review of research on higher education faculty, Adrianna Kezar reports, "Perhaps no other trend was more evident in the literature than the condition of and growth of part-time faculty. . . Part-time faculty has roughly doubled over the last 20 years, with temporary faculty especially prevalent in English, History, Modern Language and Mathematics." Is education becoming a business, ruled by the law of supply and demand? Kezar suggests it is, saying: "With most of the observable trends in higher education moving in the direction of responding to the demands of business, new technology, distance education and building partnerships with nonacademic communities, the humanities and the centrality of classroom teaching are being sidestepped."[10]

The increasing shift to a part-time faculty also poses a major threat to academic freedom. The *Chronicle of Higher Education* noted the growing threat: "Here's a news flash for people who care about academic freedom: Half the professoriate does not have it. Adjuncts are getting dumped for things tenure-track scholars do with impunity—teaching controversial material, fighting grade changes, organizing unions. One part-timer was dropped after trying to talk about pornography in an ethics class. Another was ditched after racist words came up in a communications course. Then there was the professor who got fired for harassment after he mentioned tampons and anal sex in a pathology class."[11]

In this type of situation, of course, the controversial statement or research project is not mentioned in the letter of dismissal. The offending part-time instructor is simply told that his or her contract is not being renewed because of declining enrollment, a scheduling conflict, or some other administrative excuse. We all know tenure is not a perfect system. Many things are wrong with it, but on the whole it has protected academic freedom. I am less concerned with the problems of tenure than with the problems of inadequate job security and related issues about income and professional advancement. These concerns can nurture the worst kind of censorship—self-censorship. And I believe that self-imposed censorship is a significant reason why we hear so little from faculty members about national issues confronting the United States. I have sometimes thought that faculties, not young adults, should be known as Generation X.

The lack of job security and of academic freedom inevitably take their toll on the quality of teaching by part-timers. P. D. Lesko, the head of the National Adjunct Faculty Guild, has said that "part-timers are terrified of being rigorous graders, terrified to deal with complaints about the course materials, terrified to deal with plagiarists. A lot of them are working as robots. They go in, they teach, they leave. No muss, no fuss." But Lesko adds: "If you're afraid to give an honest grade or an honest opinion, you're not teaching."[12]

Professional organizations also are limited in their ability to protect the academic freedom of so many part-time teachers. While serving as the general secretary of the American Association of University Professors' academic-freedom committee, Jordan Kurland said that part-timers with concerns about academic freedom are "entitled to a hearing, but we don't insist on the same full procedures that a faculty member with more equity in the place has."[13]

Essentially, the challenge posed by the trend of part-time faculty is the erosion of quality in institutions of higher education. Academic freedom cannot thrive in a setting where half the faculty members do not have secure jobs. Universities cannot easily separate economic security from academic freedom and autonomy.

The Challenge of Mediocrity

Higher education simply cannot afford to dedicate the first two years of college to remedial studies. But, make no mistake about it, remediation is a growth industry on most campuses. Higher education must contribute to strengthening K-12 schooling, which it can do by raising admission standards and requirements. But it must also get its own house in order, and here reform begins in schools of education.

Weak schools of education are contributors to the weakening of the university. It has long been the fashion to criticize teachers while ignoring their training, but the fact is, the quality of their preparation has a direct bearing on how well they teach. And if they teach poorly, their students tend to arrive at universities ill-prepared for higher-level courses.

Although universities should not institutionalize mediocrity and tolerate substandard schools of education, many allow their (perhaps unaccredited) schools of education to recruit education majors knowing very well that the schools cannot meet students' needs and career goals. The universities know their education schools cannot provide students with the knowledge, skills, and competency they need to fulfill their professional obligations or society's aspirations for them.

Schools of education have no excuse for offering substandard courses and programs. In one dismal indication of the problem a recent study estimated that of every 600 students who enter a four-year teaching program, only 180 complete it, only 72 become teachers, and only about 40 are still in the classroom several years later.[14]

Perhaps most shocking of all is that even inside many schools of education, the training of classroom teachers is routinely considered low-prestige, entry-level work—a responsibility given to the most junior faculty members, part-time professors, and teaching assistants. Reflecting this bias, a 1997 study found that nearly two out of three education professors acknowledge that their programs "often fail to prepare teachers for the challenges of teaching in the real world."[15] In many schools of education, prospective teachers never even have a chance to practice-teach in a K-12 classroom.[16]

Too often, the shortsighted management practice requiring every school to be financially self-sufficient exacerbates the problem. In these circumstances, schools of education, which often have no endowment, find it expedient to increase enrollments, which may require lowering standards for admission and graduation. They have created a self-contained curriculum and have increased course requirements in education as a way to avoid losing tuition revenue to other schools on campus. As part of the effort to discourage students from taking courses with the arts and sciences faculty, schools of education have hired their own professors of psychology, philosophy, or history. Thus, financial incentives often sustain the schools' intellectual isolation. No wonder that these trends have produced some poor results.

The poor preparation many teachers receive in schools of education is reflected in our K-12 schools. There we see horrifying statistics, ranging from low scores on student achievement tests to high levels of turnover among schoolteachers.

Another result is that higher education is forced to meet the remedial educational needs of its incoming students. We are told that one in three college students had taken a remedial reading course and that many of these remedial readers had taken three or more other remedial courses, including mathematics. For those who attended two-year colleges, the situation is worse: 63 percent of the students took at least one remedial course.[17] Not surprisingly, students needing remedial work are less likely to earn a degree. This is a disgrace. American higher education cannot afford to be in the remedial education business.

Technology's Challenge

Technology presents another major challenge to the university. Can technology strengthen the university and its faculty, or will it undermine the enterprise? Around us, an electronic university is emerging, one that promises to enrich teaching and make education more affordable and accessible around the world. But in our love affair with technology and in our culture's rush to say

"Out with the old, in with the new," we must not blindly ignore the flaws in our gadgets or thoughtlessly spurn principles, practices, and values developed over the past eight centuries.

Today, advances in educational technology can transcend the limits of space and time so that students may study anything, anytime, anywhere. Electronic courseware, as it is called, can be accessed on campus, across the globe, or, in due time, on the moon. Will these advances in communications do away with the need for residential universities? What will be the role of the faculty in the cyberage?

Peter Drucker, the management guru, gives the traditional university only thirty years. Frank H. T. Rhodes, president emeritus of Cornell, is also among those who seriously question whether the residential university will survive. Writing about it, he said, "I wonder at times if we are not like the dinosaurs, looking up at the sky at the approaching asteroid and wondering whether it has an implication for our future."[18] Predictions and prophecies aside, the challenges posed by electronic learning are both real and major. Some interesting trends have brought us to this place.

Higher education is increasingly dominated by older students. These older students (by some estimates already a majority) typically are employed and taking courses at night and on weekends. They want their education to be convenient and inexpensive. At the same time, the rising generation of students who have used computers and the Internet since preschool expect electronic learning in one form or another. For them, having access to the world's store of knowledge is a given, not a marvelous miracle.

One scholar who has pondered the university's future is James Duderstadt, professor of science and engineering and director of the Millennium Project, the University of Michigan's research center concerned with the future of higher education. It was Duderstadt who sought to open our minds to the unimaginable by reminding us that the rapid advances in science almost seem to be keeping pace with science fiction. In one essay he writes: "A communications technology that increases in power a hundredfold decade after decade will soon allow human interaction with essentially any degree of fidelity we wish—3-D, multimedia, telepresence, perhaps even directly linking our neural networks into cyberspace, ala *Neuromancer,* a merging of carbon and silicon."[19]

In an essay entitled "Can Colleges and Universities Survive in the Information Age?" Duderstadt predicts that higher education is due for a fundamental restructuring, similar in its breathtaking scope to the restructuring that American industries underwent in the last two decades as they responded to deregulation and global competition. After the dust of restructuring settles, he believes that many institutions of higher education will have closed or merged with others and many universities will be operating exclusively in cyberspace.

To add some details to this futuristic picture, Duderstadt gives us a glimpse of what a leading information services company sees in its crystal ball. He writes:

> Their operational model of the brave new world of market-driven higher education suggests that this emerging domestic market for educational services could be served by a radically restructured enterprise consisting of 50,000 faculty "content providers," 200,000 faculty "learning facilitators," and 1,000 faculty, celebrities who would be the stars of commodity learning-ware products. The learner would be linked to these faculty resources by an array of for-profit service companies handling the production and packaging of learning-ware, the distribution and delivery of these services to learners and the assessment and certification of learning outcomes. Quite a contrast with the current enterprise![20]

Without endorsing this particular model, he argues that the university is still living in the preindustrial age and that its "hand-crafted" courses and teaching practices do not meet contemporary needs. He writes: "As distributed virtual environments become more common, there may come a time when the classroom experience itself becomes a true commodity product, provided to anyone, anywhere, anytime—for a price."

Duderstadt is right to warn us that this "brave new world" may well bring some harmful trade-offs in higher education. If universities evolve from faculty-centered organizations to market-driven enterprises, "we could well find ourselves facing a world in which some of the most important values and traditions of the university have fallen by the wayside." Later in the essay, Duderstadt notes that

higher education "may be driven down roads that could lead to an erosion of quality." As an example of what could happen, he cites the consolidation of the broadcasting and publishing industries and notes "commercial concerns can lead to mediocrity, an intellectual wasteland in which the least common denominator of quality dominates."

His warning should be taken seriously, but I do not share his pessimism. After all, distance education is just a medium in need of content. As long as the faculty stands for excellence and controls the content of their intellectual property in teaching and research, they will not become guest workers, so to speak, hanging around the neighborhood waiting for companies to hire them to teach specific courses at specific times and places.

At the same time, the university clearly has its work cut out for itself: to reinvent itself in the cyberage. Already we are deluged with puzzling questions. Are faculty members to be reduced to the role of "facilitators" and "content providers"? For that matter, who would determine a course's content? What happens, for example, if people in China or France object to some part of a world history course that an American university distributes over the Internet? Does the history professor or the sponsoring university modify the course to make it more marketable? Who holds the copyright on the content?

Will faculty members teach at multiple universities? If so, to whom will they be accountable? This issue came up in 2000 when Harvard Law professor Arthur Miller agreed to teach an online course for Concord Law. Harvard objected, and subsequently issued guidelines saying that faculty should not be "deflected from their primary commitment to educate Harvard students by assuming competing obligations to teach for other institutions." But in this electronic age, Miller maintains that videotapes of his lectures, which he already sells, should also be his to sell to Concord as a lecture course.[21]

Never before have so many fundamental questions been raised about the role of the faculty or the university itself. These very exciting and difficult times produce an impatience for simple answers. But, as H. L. Mencken once cautioned, "There is an easy solution to every human problem—neat, plausible, and wrong."

There is a common thread in these challenges: The info-glut cries out for the university's help with synthesis, and rebuilding the liberal arts will improve synthesis. Similarly, strengthening the entire faculty means strengthening every aspect of the university—from the quality of teaching and research to academic freedom. Strengthening the faculty will also, I believe, help the residential university continue to make its essential contribution to the nation in this cyberage.

Our first big challenge is how to transform undigested data and information into structured, integrated knowledge and make that knowledge widely available. As daunting as these challenges are, technology itself is reason for optimism. For one thing, the new technologies, a primary cause of the info-glut, also offer promising opportunities to create, integrate, and disseminate knowledge. Information scientists are making greater uses of artificial intelligence to automate information management tasks, including data mining, the practice of having a computer continuously monitor, filter, and collect information according to set parameters. The new technologies stand to deliver unheard-of benefits to seekers of information, instruction, knowledge, and community. But it will take time to integrate these tools into the historical identity of the university and, conversely, to accommodate the university's traditional organizational and social structures to these media.

University faculty also must recognize that the info-glut and the fragmentation of knowledge call for reorganizing the curriculum to create more coherence and more strength in the liberal arts, especially by renewing the centrality and interaction of sciences, humanities, social studies, and arts. After all, just because technical and expert knowledge are in high demand now, we should not lose sight of the important role that the liberal arts play in our society. Higher education, of course, is not just "hire" education, as in job training. One of the great advantages of a liberal arts education is that it teaches us to think and to learn. Today more than ever, we are confronting ethical challenges in technology and science: Human cloning, stem cell research, and other difficult issues require informed deliberation and action in public policy.

The faculty has been the heart and soul, the bone marrow and blood, of the university for centuries. We cannot undermine the quality of the faculty without undermining the quality of the

university. Therefore, faculties and universities have to courageously face the issue of part-time teachers. We cannot have a two-tiered system, especially one so unequal, without promoting the idea that the whole faculty could be part time. This two-tiered system has a demoralizing effect on our own graduate students, who see, on one level, a completely insecure future as an adjunct and, on another level, an overly secure future, with no mandatory retirement age, for the full-time tenured faculty. We could speculate that this system helps explain why—until recently—so many of our nation's graduate students were from abroad.

The faculty and the university administrations must reassess the whole issue of tenure and part-time appointments. There are many ideas. In 1999 the American Association of State Colleges and Universities issued a report saying that the large number of part-timers was inevitable—and, because of that, universities should train them, evaluate them, and pay them more like full-time professors.[22] I believe the report should be given serious consideration.

I also believe that faculty members, including part-timers, must have some sort of job security for academic freedom to flourish. Tenure is not the only answer, and may not even be the best answer either. I often wonder whether it is reasonable to assume that twenty-first-century universities will remain accepting of the idea that an individual appointed in his or her thirties or forties should enjoy life tenure, defined literally as guaranteed employment until the age when senility sets in. Perhaps it would be better to guarantee term appointments of five, ten, fifteen, or twenty years. These appointments could be renewable if a peer review finds that the individual's teaching and scholarly work warranted it.

It seems, unfortunately, that many faculties in our universities are not engaged with these challenges to their profession. In her review of research on faculty issues, Kezar concluded, "The literature in this group is quite rich and many important new models and ideas are being developed related to faculty roles and lives. Unfortunately," she adds, "these discussions are for the most part happening outside of the faculty, among legislatures, college presidents and administrators."[23]

The faculty has three options: take a leadership role; abdicate responsibility; or go it alone and let outside factors and forces dictate the future structure of the university. My preference must be obvious.

In a similar vein, the faculty also must take the leadership role in monitoring and addressing the increasing corporate presence on campus. This change in tradition needs careful attention, but as yet does not seem out of control. According to the National Science Foundation, the amount of basic research conducted in universities has remained fairly stable since 1980, the very same period of increasing corporate investment in the university.[24]

The oldest challenge, which the university has swept under the carpet for decades, can no longer be ignored. Whether by design or by benign neglect, universities have created a culture of mediocrity, particularly in schools of education. What is true in nature is true on campus: One weak link weakens the whole chain. In the twenty-first century it is also crucial that universities recruit high-achieving graduate students, nurture this talent, teach them well, and be on the cutting edge of science, technology, and scholarship in the humanities and social sciences. We must remember that the entire university faculty— every member of every school—is part of the university. The schools should not be treating each other as isolated silos, because the strength of the university is in its totality.

Distance learning and electronic learning offer major benefits, ranging from expanding access to education to making educational materials more suitable for individual needs. But swept up in this electronic wave is the false notion that an education can merely be a bunch of courses when, in fact, an education requires following a well-constructed curriculum of study.

For now, and I believe forever, technology will supplement education, but never replace the need for the residential university, especially for students coming from high school. A university education, after all, represents a universe of activity, a four-year process of learning—with the faculty and curriculum at the center. It is about living with your peers; learning from them; participating in classrooms, athletic fields, and laboratories; questioning guest lecturers as well as attending political rallies, poetry readings, and exhibitions. Students are exposed to the diversity of races and religions and opinions; indeed, the whole world comes together at the university. The

university also serves as a social melting pot, as the nation's campuses, in the absence of a military draft, are the only places left in America where different ethnic groups, races, and economic classes of people mingle. The university is also about developing networks and making lifelong friends. Universities and colleges are not way stations but are a part of our communities and as such are central to our economy, tradition, and culture.

However, I fear that half-baked responses to marketplace pressures and to the other challenges may warp the university beyond recognition. The university has not come eight centuries to evolve, almost overnight, into a Home Depot of courseware where there is no differentiation between consumption and digestion or between information and learning. The nation cannot afford to turn the university into an academic superstore, a collection of courses marketed much like sinks and lumber.

Throughout our history, the university has risen to challenges, whether it was the democratization of knowledge, the Depression, Sputnik, or affirmative action. No challenge has been too daunting, and I believe the challenges I have described here can be met imaginatively—so long as we hold constant to our commitments to academic freedom and the centrality of the faculty. Institutions with excellent, high-quality faculty will survive and thrive. Those with a mediocre faculty will not likely survive the competition. During times of revolution, the strong prevail. The weak coalesce, merge, or disappear.

Will faculties and universities respond to the challenges or retreat from them? Universities—which invented the computer, the Internet, and distance learning—are not derivatives, in stock market lingo; they are a primary source of knowledge, inspiration, and invention. Universities will survive provided they do not undermine themselves; I believe that they are not so much at risk from external threats as they are from internal ones of our own making. As Walt Kelly's comic-strip character Pogo observed, "We have met the enemy, and he is us."

As we face higher education's challenges, we must remember that the university in the West is the result of some eight centuries of struggle, oppression, perseverance, and endless refinement. The university is a living institution, and change it must. But as we make changes, we must be careful not to inadvertently undermine its foundations, muddle its architecture, or reduce its priceless value to society.

Notes

1. Neil Postman, "Informing Ourselves to Death," speech given at a meeting of the German Informatics Society, Stuttgart, October 11, 1990, p. 5.

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3. Richard Saul *"Wurman, Information Anxiety* (New York: Doubleday, 1989).

4. Carol M. Barker, "Liberal Arts Education for a Global Society," 2000 Carnegie Challenge Paper, Carnegie Corporation of New York, p. 4.

5. Mark G. Yudof, "Is the Public Research University in America Dead?," unpublished article, July 2001.

6. The University of California at Berkeley, College of Natural Resources, Web site: www.cnr.berkeley.edu/srr/Alliance/concerns/htm/; see also http://plantbio. berkeley.edu/PMB-TMRI/Background.html/; see also Goldie Blumenstyk, "A Vilified Corporate Partner Produces Little Change (Except Better Facilities)," *Chronicle of Higher Education* (June 22, 2001): 24.

7. A. Berger et al., "Institutional Policies and Practices: Findings from the 1999 National Study of Postsecondary Faculty," report for the U.S. Department of Education, National Center for Education Statistics (NCES 2001-201), Washington, D.C., 2001, pp. iii and v.

8. Pamela Balch, "Part-Time Faculty Are Here to Stay," *Planningfor Higher Education, Society for College and University Planning* vol. 27, no. 3 (Spring 1999), pp. 32-40.

9. Ethan Bronner, "Study of Public Universities Advises Changing Faculty of the Future," *The New York Times,* January 13, 1999, p. B9.

10. Adrianna J. Kezar, "Faculty: ERIC Trends 1999-2000," ERIC Clearinghouse on Higher Education, U.S. Department of Education, Institute for Education Policy Studies, ERIC #ED-446652, 2000.

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13. Ibid.

14. Richard W. Richburg et al., "How Much Does it Cost to Train World-Class Teachers?," *International Journal of Innovative Higher Education,* n.d., as cited in a Report of the National Commission on Teaching & America's Future, "What Matters Most: Teaching for America's Future," Teachers College, Columbia University, September 1996.

15. Steve Farkas et al., *Different Drummers: How Teachers of Teachers View Public Education* (New York: Public Agenda, 1997).

16. Ibid.

17. *The Condition of Education 2001,* "Postsecondary Persistence and Progress," National Center for Education Statistics, U.S. Department of Education, p. 49. (A summary of the High School and Beyond Longitudinal Study of 1980 Sophomores, "Postsecondary Education Transcript Study," NCES, U.S. Department of Education.).

18. Postman, "Informing Ourselves to Death," p. 2.

19. James J. Duderstadt, "The Future of the University in the Digital Age," *Proceedings of the American Philosophical Society vol.* 145, no. 1 (March 2001): 56. Duderstadt's reference is to the so-called cyberpunk book by William Gibson.

20. Duderstadt's revised essay is in *Dancing with the Devil: Information Technology and New Competition in Higher Education,* a publication of EDUCAUSE, Richard N. Katz and Associates (Washington, D.C.: Jossey Bass, 1998), p. 20.

21. Harvard University, Office of the Provost website, "Statement on Outside Activities of Holders of Academic Appointments (effective July 2000)."

22. Bronner, op.cit.; see also, Denise K. Magner, "Report Urges Post-Tenure Reviews for Professors and More Pay for Part-Timers," *The Chronicle of Higher Education,* January 22, 1999, p. A10.

23. Kezar, "Faculty," p. 7.

24. Business-Higher Education Forum, a partnership of the American Council on Education and the National Alliance of Business, *Working Together, Creating Knowledge: The University-Industry Research Collaboration Initiative* (Washington, D.C.: American Council on Education, 2001), pp. 23, 27.