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Equilibrium in the Research University

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# EQUILIBRIUM IN THE RESEARCH UNIVERSITY

BY RICHARD C. ATKINSON & DONALD TUZIN

In his article, "The Storm Over the University" (*The New York Review of Books*, December 6, 1990), philosopher John Searle disarmingly comments that he does not remember a time when American universities were not in a state of crisis. A fair comment, considering that crisis (from the Greek *krisis*, meaning "decision") is surely the natural condition of an institution concerned with the making of informed choices. Debate, criticism, and intellectual contest are the pulse of academic health. Another kind of crisis concerns disagreements over the proper role of the university in society. These crises are noticed from outside the university, for they represent competing educational values, political philosophies, and social agendas, many of which are exogenous to the academic community. Thus universities contribute to American society at large—but through a process normally incremental, involving minor shifts in curricular and budgetary policies that integrate the university with its many public and private constituencies. American research universities are most closely associated with this kind of crisis because they are committed to pursuing several objectives at once—postsecondary instruction, basic and applied research, and professional training and service.

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Around these three missions, a system of academic relationships, functions, and moral understandings has developed that compromises the culture of the American research university. A loss of equilibrium in this system not only impairs its functioning, it also produces a crisis of values—a pervasive sense that the institution has lost its bearings and is ruled by ideas alien to our traditional understanding of what the university is and ought to be. We suggest that many of the problems besetting the research university are traceable to disequilibrium in the system of academic relationships. The strain toward fragmentation, inherent in the tripartite design of American higher education and tolerated, sometimes worrisomely, for the past three decades, is now emerging as a crisis in its own right.

Judging from many stories in the media, one of the chief symptoms of this imbalance is a malaise spreading across the nation's campuses that is suggestive of difficulties in the moral integration—or sense of community—of the university. Although expressed as a crisis of values, the problem will not be solved with empty rhetoric, but with reform of the underlying system of relationships; all the more so, with regard to the more tangible problems

associated with the university's teaching and research endeavors. Moreover, contrary to the nostalgic inclinations of many critics of the university, the solution to our problems does not lie in returning to some mythic era in which all was goodness and light. Crisis is bred in the bone of the American research university; academia has constantly changed and will continue to do so. The goal, then, of reform should not be to deny current realities or rescue the university from them, but to restore the structural balances through which the university attunes itself to a changing world.

Lest we be misunderstood, we should declare that our motives are constructive. The research university is a magnificent institution—the pride of American education—but it can be made better. Some of its critics are plainly ignorant, hostile, or ideologically propelled—but, where there is an element of truth, the devils are owed their due. Our comments, however, are not addressed to them, but to the academic community. For those who rightly regard the university's research mission as in need of protection, we emphasize that the balance advocated here is not a zero-sum equation. In suggesting that research has become overvalued relative to teaching, we do not propose that re-

sources be diverted from the former to the latter. No reform would justify slowing the momentum of discovery that has been the research university's crowning achievement. The balance must be gained, rather, by upgrading the teaching mission—by increasing the esteem and efficiency of the educational component, not by increasing teaching loads at the expense of research. Finally, to those colleagues who judge some of our comments to be overgeneralized, we admit that the “research university” of this essay is an abstraction. While the conditions ascribed to it are not universal, neither are they unusual in our experience. In the past few years, notes ACLS President Stanley M. Katz, “universities have devoted themselves to defending our palaces and responding in an ad hoc manner to successive assaults” (“The Plight of the Humanities in the Research University,” Princeton University, November 14, 1991). There are barbarians at the gates of academia—there always have been—but their drumbeats should not deafen us to problems that arise from within and that merit our attention.

#### **Scale and Fragmentation**

American higher education draws its distinctive character from an attempt to fulfill three missions:

• The propagation of knowledge. This is the classic liberal arts tradition; it seeks to instill higher mental culture in large part through teaching the masterworks of Western civilization. In its original English form, this approach created a symbiosis between an elite intellectual tradition and an elite social class that was its custodian. Its American version redefined the idea of an enlightened ruling class to accommodate the Jeffersonian ideal of an enlightened citizenry, one capable of democratic self-rule.

• The creation of knowledge. This concept, initially embodied in the German university, was introduced to this country in 1878 through the founding of The Johns Hopkins University. The idea that a university could be a center of scholarship and scientific discovery spread to other American universities and, for the last hundred years, has existed in a somewhat uneasy partnership with the teaching function.

• The application of knowledge. Beginning with Abraham Lincoln's 1862 signing of the Morrill Act (which established land-grant colleges and universities), institutions of higher learning have been expected to contribute—through their teaching, research, and service—to the practical and “mechanic” arts: agriculture, business, law, medicine, and the like.

A sheltered grove in which knowledge is propagated, created, and applied. This was the vision for the research university of the 20th century. For a time it did, indeed, flourish in something approximating this form, culminating in the post-Sputnik research university. So long as a balance remained—so long as the three domains remained manageable—the whole could exist under one roof. In recent decades, however, all three domains have grown in size and complexity, straining their coexistence almost to the limit.

Today's research university addresses its teaching functions not to the sons of society's elite, as was largely the case before World War II, but to the daughters and sons of a mass society. Between 1955 and 1990, enrollments in U.S. colleges and universities increased by 400 percent (U.S. Department of Commerce, 1990). This expansion of the education-

al franchise means that universities, like the surrounding society, are becoming multicultural fairs, subject to all of the social hazards that such a juxtaposition of interests implies. Ease of international travel and communication in the post-war world has also deparochialized American academia, multiplying the range of perspectives brought to the podium. The standard curriculum, once designed to transmit a consensual canon of knowledge, is now embroiled in contests over what the canon should contain, or whether there should be a canon at all. No longer sure whether its purpose is to understand the world or transform it, the university has become home to debates involving intellectual doctrines that challenge traditional models based on white, European maleness.

The dramatic expansion of the university's teaching domain pales in comparison with the explosion of research and scholarship that has occurred since World War II, primarily because of the powerful funding relationship between the federal government and research in the university. (For our purposes, “research” refers to scholarship in the humanities and social sciences, as well as in engineering and the physical and biological sciences.) In 1955, the U.S. spent \$409 million in academic research (U.S. Department of Commerce, 1971); by 1989, that figure had climbed to \$13.9 billion. In constant 1982 dollars, academic R&D expenditures climbed 54 percent between 1980 and 1989. Furthermore, in 1987, 100 universities received 83 percent of the total R&D funds granted to American academic institutions. These figures (taken from the *Engineering Indicators-1989*) bespeak a very successful national effort. Whatever weaknesses may exist in other sectors of American education, the nation's research universities are the envy of the world; as centers of discovery and graduate and professional training, no other system compares with them. And yet, the enormity of this magnificent enterprise, evidenced in the proliferation of disciplines, rampant specialization, and runaway growth in publishing and conferencing, is causing the research university to fragment as an intellectual community.

Finally, there has been a corresponding growth in the number, variety, and

technical content of professions requiring university training. It used to be that training for most careers had nothing to do with the university. Prior to this century, knowledge to pursue medicine, law, and engineering was typically acquired in apprenticeships or other types of on-the-job training. Today, training for the professions is a major function of the university, with the number of degrees awarded in this area nearly doubling between 1971 and 1985 (U.S. Department of Education, 1991). Nor is it only the “learned professions”: A host of new careers (ranging from business, banking, and finance to social work, interior design, architecture, and the performing arts) also requires university preparation and certification—many at the postgraduate level. These developments, like those in teaching and research, have contributed to the complexity of the research university, and to its increasingly fragmented identity.

### Signs of Crisis

Pressured by institutional growth and fragmentation, the American research university is under stress, both internally and in its relation to the wider society. Best-selling books are written on the problems of American higher education; editorials and feature articles abound with news and comment about how universities are failing to meet their responsibilities; government agencies and private foundations sponsor countless reports and surveys showing that all is not well in American higher education. It is the research university that takes the brunt of criticism—understandably so, for it embodies society's highest intellectual and scientific ideals. The problems are many, but a few are particularly acute.

To begin with, the public appears to be losing faith in the research enterprise, without necessarily discriminating between private and government sectors on the one hand, and university-based research on the other. Not that people are disillusioned with research itself—for the most part, their appetite for discovery appears to be as strong as ever—but with the way research is carried out. Soaring costs are one area of concern, especially amid huge federal and state budget deficits. Taxpayers were aroused by the amount and occa-

sional impropriety of indirect costs on federally funded research grants, publicized in the case of Stanford University. Causing similar disquiet are large cost overruns on government-sponsored "big science" projects (such as the Superconducting Supercollider) and expensive failures (such as those involving the Hubble Space Telescope).

In the heated competition for research funds (where fame, reputation, and even the ability to continue one's research depend on a grant-attracting stream of discoveries), scientific fraud and misrepresentation have provoked public disillusionment. (Of course, scientific fraud is nothing new; but, in recent years, the instances have been notorious enough for the public to infer that dishonesty and unethical conduct are not uncommon in the research community.) Inquisitorial responses by government indicate a lack of confidence in the academy's readiness to enforce appropriate ethical standards. For those who view cheaters as more sinned-against than sinners, the true culprit is a ruthless "publish-or-perish" doctrine driving professors to dishonesty. Whether or not publishing demands exculpate such behavior, they surely congest the conduits of scholarly exchange with items of questionable worth. In a recent address, Stanford University President Donald Kennedy notes that "the overproduction of routine scholarship is one of the most egregious aspects of contemporary academic life: it tends to conceal really important work by its sheer volume, it wastes time and valuable resources, and it is a major contributor to the inflation of academic library costs." Extremely low citation rates in many academic disciplines tend to confirm a negative assessment of academic publishing (David P. Hamilton, "Research Papers: Who's Uncited Now?" *Science*, January 4, 1991). To counteract this trend, Kennedy proposes that Stanford limit the number of publications that can be considered in faculty appointment or promotion.

Problems such as these undermine the research university as a moral community, weakening its resolve in the face of attacks on intellectual and scientific values central to its mission. The demoralizing effect of scarce resources must be recognized among the factors

contributing to this decline. If power and wealth corrupt, so do their opposites. Just as financial troubles can wreck a marriage, so the present shortfall in research funding can undermine academic relationships. Even allowing for a certain amount of waste, inefficiency, and plain venality in the research establishment, the principal problem boils down to this: There are too many researchers chasing too few dollars. The research establishment would prefer a solution based on more funds—but, in the present budgetary climate, it is probably unrealistic to expect significant new funding. Rather, the solution must be to reorganize and consolidate the structure of research—a task that ultimately involves relations with industry, business, and government. However, research universities can relieve the strain on resources by honing the research enterprise to remove individuals whose academic energies would be better directed elsewhere. This effort will require major reforms in the relationship between research and teaching in the university. To anticipate a later discussion, the argument is that only by reforming its *teaching* mission can the research university recover lost moral ground and restore credibility to its *research* mission.

When speaking of institutional distress, it should not be forgotten that the problem of resource scarcity falls heavily on the science faculty. In recent years, the success rate among NSF applicants has fallen precipitously (Joseph Palca, "NSF: Hard Times Amid Plenty," *Science*, April 27, 1990). A generation ago, a productive biologist would submit two or three grant proposals, expecting at least one to be successful; today, he or she must submit 8 to 10 proposals, in the hope that one will be funded. According to an American Physical Society study conducted last year, only about 14 percent of the young physicists who applied for federal funds received grants in the amount requested. A survey conducted by Nobel Laureate Leon Lederman found that pessimism and frustration are intense among young scientists—even those fortunate enough to be on the faculties of prestigious universities. (See Joseph Palca, "Young Investigators at Risk," *Science*, July 27, 1990. Such

bleak attitudes cannot but be noticed by undergraduates who might otherwise choose academic or industrial research as a career goal. A deterrent effect would be consistent with the steep decline in the number of students majoring in mathematics and physical science, and with the projection of shortages of Ph.D.s in these fields. See also Richard C. Atkinson, "Supply and Demand for Scientists and Engineers: A National Crisis in the Making," *Science*, April 27, 1990.) For faculty, the increased time spent in chasing research funding is time taken away from teaching and other duties. As academic relationships erode, students come to regard professors as selfish and uncaring, while professors grouse that students are overly demanding and ill-prepared.

The consequence of this unhappy reciprocity is that the ethos of the academy is marked by a sense of estrangement—isolation combined with rejection—on the part of many students and faculty. These attitudes are not restricted to the sciences—although, generally speaking, research in the social sciences and humanities is not dependent on large extramural grants, faculty in these fields are also desirous of the prestige assigned to research, with corresponding consequences for their teaching mission. Thus, while the scarcity of federal funds for research may have exaggerated the imbalance of teaching and research in the sciences, the spread of this imbalance to other fields suggests that the problem is cultural as well as fiscal.

If, as taxpayers, citizens are irked by problems in the university's research enterprise, as parents, they are alarmed by media reports about the state of teaching in some of the nation's most prestigious universities. Persons paying yearly tuitions of over \$20,000 are entitled to receive instruction from the distinguished professors featured in promotional packets, as well as to expect classes to be available and of reasonable size and to take lectures from professors and teaching assistants who treat their job seriously and speak intelligible English. The suspicion emerges that professors selfishly pursue research to the neglect of teaching. While this suspicion may be partly justified, the competition that has arisen between teaching and research has little to do with the personal





failings of members of the professoriate, the great majority of whom take their teaching responsibilities very seriously. Developments within the university that are systemic in character—and largely outside the control of professors—are to blame. We now turn to these developments, beginning with problems associated with the emphasis on research in American higher education.

### Estrangement of Teaching and Research

The excessive emphasis on research is evidenced in the specialization of academic disciplines, and the effects this specialization has had on undergraduate curricula. John Searle observes that:

It is characteristic of American education that each stage is primarily designed to prepare the student for the next stage, so the best high schools prepare the student for college, and the best colleges prepare the student for graduate school. Since the professors think they know what they are doing in graduate education, it is not surprising that they also feel confident at designing undergraduate majors. The programs are designed to prepare the student for graduate work. In general education the failure of nerve derives from the fact that we do not know what we are preparing the student for.

Such a system has negative conse-

quences. On the one hand, courses designed for the few are applied to the many. Undergraduates who do not have an interest or aptitude for graduate studies are nonetheless educated according to those goals. Not only the quality of their academic performance, but early commitment to those postgraduate goals becomes the standard by which undergraduates assess themselves and each other. The risk is that those who do not go on to graduate or professional school will be seen as falling short of institutional expectations—and, thus, as failures. One might reply that such students should not go to a research university in the first place. But this assumes that students have realistic career goals at the time they apply to the university: The fact is, most do not. Yet, they apply to the research university because they see this as a way of keeping their career options open. They and their parents are aware that society judges research to be the cachet of high academic achievement and have been sold on the idea that research universities offer the best education. When, eventually, they discover that graduate or professional school is not for them, they may become casualties of a curriculum designed without them in mind.

This view of education as “preparatory” (which is common in research

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universities and is encouraged by campus statistics citing the percentage of students who go on to graduate or professional schools) devalues the bachelor's degree as a preparation for life as an informed, thinking adult. Undergraduate education is becoming a matter of heuristics; we speak of “pre-business” or “pre-law” majors, furthering a trend that debases the value of undergraduate education. What is worse, the perceived inferiority of the general education degree becomes self-fulfilling, since faculty who pride themselves on the training of pre-professionals may not attend to the challenge of a curriculum for students not professionally oriented. (Despite its key position in American higher education, the departmental major is remarkably unexamined. A recent report by the Association of American Colleges observes that, since its inception at The Johns Hopkins University in 1878, the “now-ubiquitous major” has never been subjected to study by a national body—see *The Challenge of Connected Learning*, Washington, D.C.: Association of American Colleges, 1991, page 1.) The effect of this attitude toward a college education is perhaps suggested by the vicissitudes of American secondary education. Once it was established that the high school's noblest function is to prepare students

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for college, the value of the high school diploma plummeted, occupational inflation soared, the quality of education available to the *average* student declined, and colleges found themselves in the ironic position of having to provide remedial coursework for entering freshmen.

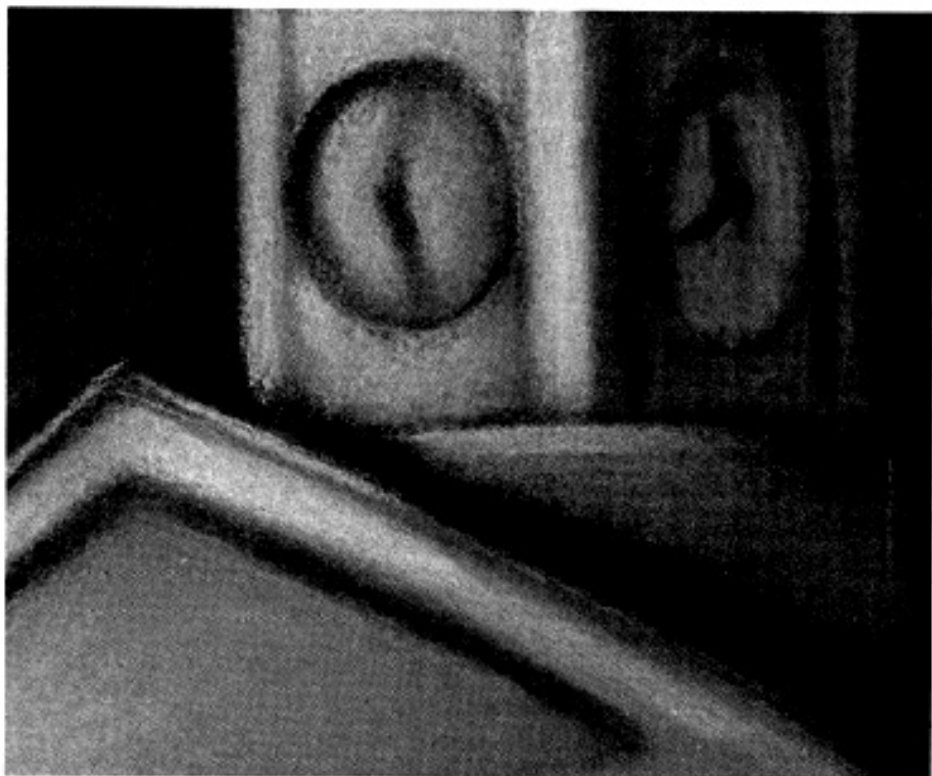
For students who enter the learned professions, the consolation is a rewarding, prestigious career; for the many who do not, the failure to meet institutional expectations—experienced and remembered—becomes the basis for negative attitudes toward universities later in life. The education-as-preparation ideology falls most punishingly on students in the arts and humanities, who are without obvious professional or vocational goals. The philosophy graduate who drives a taxi is not only a cliché of our time, it is an image warning off all those foolish enough to consider majoring in such a field. It is a declaration of society's lack of interest in the lessons and mental discipline that fields like philosophy can teach.

Research universities have not done a creditable job in promoting general educational values to their students, let alone to the public at large. Indeed, by their heavy emphasis on professionalization and specialization, these universities have done their share to disparage

the idea of education for its own sake. Once it is realized that this attitude has gone too far—that it has become damaging to the institution—research universities will move to restore the dignity of the bachelor's degree as a sufficient goal of higher education. One approach, employed at UC-San Diego, is to devise (in addition to the current array of specialized majors) a category of general majors that transcend conventional disciplines. Studies in, for example, "physical sciences" or "humanities" could provide the kinds of broad-based, integrative knowledge and reasoning skills that are sorely lacking in the populace—even among the university-educated segment. Another approach, one that has been implemented at UC-San Diego, is to institute a comprehensive multi-track system of department majors. This would entail several alternative majors within each department, at least one of which would not be intended to lead to professional or graduate school, but would be designed to provide a general education in the subject—and a valid foundation for whatever kind of living one chooses to pursue. This general major would not be a "Physics for Poets" kind of track, but one as demanding in its terms as the others are in theirs. Students could choose which track to pursue and switch tracks at their discretion.

The point of such reforms would be to validate the general degree, ennobling students who, for whatever reason, are at the university principally to acquire a liberal arts education.

Just as the high school is preparatory to college, and the major is preparatory to graduate or professional school, so the early years of college are increasingly preparatory to the major. This attitude informs the practice of many universities to encourage or require students to declare their major as part of the admission process. Instead of encouraging students to gain some academic experience before choosing a major, the system violates its own intellectual values by pressuring them to make uninformed choices. This may be expressed as a seemingly friendly inquiry into the student's interests, or—as in the University of California application document—an intimidating summons, complete with page upon page of computer-coded majors for each campus in the system. A policy that induces students to make a premature declaration of major has a chilling effect on general education: It encourages a false consciousness leading to frustration, disappointment, and failure for those students who end up not pursuing their original major. Introductory courses in tough, prestigious fields are designed



not to recruit and retain, but to eliminate and exclude. Multiple changes of major become the norm, as dispirited students cast about for a course of study. The bitterness engendered by such a system contributes to the malaise on campus, and to the memories carried by students after graduation.

Without intellectual and moral coherence, without a notion of what general education is about, the academic fabric of these introductory years unravels. Core curricula are the first to go, replaced by distribution requirements, in which students select courses from within broad categories, such as "social science." Greater flexibility means that students can satisfy general education requirements with courses handy to their schedules, and departments can service these requirements in ways that readily accommodate changing faculty preferences and research activities. These practical benefits should not be underrated. And yet, to the extent that curricula are haphazard, arbitrary, or expedient, their courses tend to become unloved: Students do not want to take them, and faculty do not want to teach them. (As the chair of a prominent biology department put it, "Regular faculty resent having to teach general courses. That's not what they're here for.") The unimportance of such courses is announced by their being assigned to junior or temporary faculty—in whose hands intellectual integration is often further attenuated. Eventually, the curriculum becomes hardly more than a random array of courses. Freed from curricular confines, no longer answerable to a consensual view of what students ought to be taught, faculty have only their own specialized interests to consult in devising courses. While this may be an effective way to bring research expertise into the classroom, when taken to excess, it neglects the broader purposes of undergraduate education.

To be sure, there are faculty who accept the intrinsic value of general, integrative courses—but they are up against students and colleagues for whom intrinsic qualities are largely irrelevant. Likewise, some students enjoy general courses for their intrinsic interest, but they are up against faculty and peers whose motives are instrumental rather

than intellectual. These exceptions notwithstanding, the ethos of today's research university favors the teaching of research specialties. A simple narrowing of academic exposure would be less damaging, perhaps, were it not for the accompanying decline of education at the secondary level. For, without an adequate high school foundation, specialty courses cannot integrate the social and intellectual experience of undergraduates. (A social cost arises from the reification of diverse specialties in a way that engenders opposition between, say, scientists and humanists, experimentalists and theoreticians, males and females, homosexuals and heterosexuals, whites and "persons of color." In this way, the "political correctness" sweeping the nation's campuses is a symptom, not a cause, of disintegrative processes that are at once intellectual and moral in character.)

Departments typically design lower-division courses neither to enrich a student's general education, nor to provide broad introductions to the field—but to prepare the student for the major. Thus, the ethic of specialization operating at the faculty level reacts upon, shapes, and debases the intrinsic value of prior levels—in the training given to graduate students, in the design of the major, and in the pronounced narrowing of general education. To an alarming extent, professors who received their graduate training within the last 20 years are either unable or unwilling to teach general courses, and the fragmentation of intellectual experience continues—creating, in the words of a history graduate in UC-Berkeley's Class of 1991, a "vast emptiness at the core of today's liberal arts education" (Max A. Boot, *Los Angeles Times*, June 17, 1991).

The relative overvaluation of research has done more than separate undergraduates and faculty—it has estranged them. In a recent survey sponsored by the Carnegie Foundation for the Advancement of Teaching, faculty were asked, "Has the balance of importance among teaching, research, and service at your institution shifted in recent years?" Twenty-six percent of all respondents reported that the balance had shifted toward research and away from teaching and service, whereas only 5 percent

reported a shift toward teaching and away from research and service. The breakdown according to institutional type was dramatic. In percentages: 23/13 for research universities; 56/0 for doctorate-granting universities; and 34/1 for comprehensive universities. Only in liberal arts institutions was the movement otherwise: 12/8 (quoted from Boyer, 1990).

Lower-division instruction is increasingly assigned to graduate students, lecturers, and untenured professors. The University of California Task Force on Lower Division Education, chaired by Neil J. Smelser, recommended in its 1986 report that departments assign their most brilliant instructors, regardless of rank or title, to introductory-level courses. We are not aware of any significant effort to implement this recommendation.

Some of the teaching by temporary or junior faculty is excellent, but the trend shows that the teaching function is progressively separating itself from the research function. Unfortunately, a common "sweetener" added to faculty recruitment packages is reduced teaching loads, or the promise to restrict teaching to the graduate level.

The estrangement of students and faculty entails reduced interactions by which students acquire values appropriate to the university. To the extent that temporary instructors are estranged themselves, students can be exposed to opinions from the lectern that undermine the credibility of the faculty. This effect can be exacerbated in fast-changing fields, where senior faculty are perceived by young colleagues as being old-fashioned in their research and teaching. If the student goes on to major in the field, contact with senior faculty will improve their outlook—but the impressions gained through lower-division exposure to *other* departments would remain uncorrected. The situation breeds a cynicism, which students take with them upon leaving the university. Too often, they are willing to believe that professors are lazy, self-centered, contemptuous of students, and abusers of the tenure system. A free-floating discontent of today's students can become a focused contempt of tomorrow's voters. It is not the naive hostility of the uneducated that universities should



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fear; it is reprisal by their own graduates. Research universities can rectify this problem through some changes.

1) Students should be discouraged from declaring a major until some academic seasoning has occurred. This would enhance the significance of general education courses, as well as the chances of a successful first choice, thereby reducing the incidence of "failure" in the system.

2) Universities should institute core curricula mandatory for lower-division students, based on a faculty consensus regarding general education. For maximum acculturative effect, the curriculum should begin when a student enters the university. A sense of moral community would be built upon such shared intellectual experiences. If appropriate, different curricular concepts could be embodied in a collegiate system, in

which each college within a university applies a distinct educational philosophy to its general education requirements. Such a system, a version of which exists at UC-San Diego, combines the intimacy of a small, liberal arts college with the intellectual cosmopolitanism of a major research university.

3) Each department should institute, in addition to its various pre-professional majors, a general major leading to a baccalaureate with broad educational value; similarly, general majors could be designed to educate students broadly in several related disciplines. In either case, the general degree would be a rigorous program for students who are not oriented toward graduate work in the discipline. By such means, a B.A. in Physics, for example, could anticipate a career in business or in teaching in the schools.

4) To sustain these teaching advances, graduate students should be educated to a level of disciplinary breadth that prepares them to teach general, integrative courses in their field.

5) Faculty at all ranks should be encouraged to participate in lower-division teaching—and should be rewarded for doing so.

Among these measures, the last is perhaps the most difficult to implement. It also is the most important, for unless professors increase the value they place on teaching, no amount of curricular reform will affect the moral crisis besetting the research university. When it comes to inspiring the professoriate about its teaching mission, legislators and boards of trustees normally use coercion, thus contributing to the idea of teaching as punishment. A positive approach—one that would elevate teaching in the faculty reward system—is to draw upon the "organizational slack" that has accumulated in the research university. To this we now turn.

### **Teaching, Research, and Faculty Rewards**

The recognition that the research function is excessively emphasized in today's research university is a step toward upholding, not diminishing, the importance of research. To the extent that an excessive emphasis on research

reflects an imbalance in academia, each component is served by rectifying that imbalance. One way to proceed would be to admit failure—to acknowledge that research and teaching are mismatched in today's university, and that a divorce is in order. The separation of research and teaching exists, for example, in Germany, France, and Russia, though there are indications that these countries are beginning to move toward the American model of the research university. In the American context, removing graduate students from the scene of undergraduate instruction would have a devastating effect on undergraduate education and would deprive graduate students of the opportunity to acquire teaching skills as part of their training. And, of course, removing graduate students from the instructional setting would diminish the scope of their own intellectual development.

If divorce is not realistic, another solution would be to redesign the partnership between research and teaching so that senior faculty could modify their mix of activities according to circumstances. In principle, the reward system of the research university grants equal weight to research and teaching, but it actually favors research: It is assumed that meritorious faculty are heavily engaged in research throughout their careers. However, as anyone with experience knows, academic career rhythms are not uniform, nor is the relationship between research and teaching the same in different disciplines. The present system is doubly wasteful: First, it denies senior faculty the flexibility they require to work with maximum effect and personal satisfaction using whatever mix of research and teaching currently suits them; second, it congests the national funding apparatus with applicants who compete not to advance the frontiers of knowledge, but to survive professionally.

The object of the reform is flexibility, not the substitution of one set of rigid criteria with another; the balance of teaching and research should be adjustable over the course of an academic career. Professors who thrive on the intense daily mixing of teaching and research would proceed as they have in the past. But for others, whose academic rhythms are otherwise, proce-

dures could be devised to enable members of the faculty to move more freely between teaching and research. With excellence in the classroom recognized and rewarded, professors would be able to distribute their creative energies strategically, using the classroom as an additional venue for the synthesis of ideas. While laboratory commitments might prevent some professors from temporarily reducing their research effort, when the time is right, such a person might welcome the opportunity to shift from the bench to the lectern. Similarly, Boyer (1990) recommends that "colleges and universities develop what might be called creativity contracts—an arrangement by which faculty members define their professional goals for a three- to five-year period, possibly shifting from one principal scholarly focus to another."

A system in which faculty were able to regulate the mix of their academic activities in accord with their career rhythms would have several salutary effects. Institutional efficiency would improve—along with faculty morale—as professors realize greater freedom in how they choose to invest their talents and energies. This arrangement would not be viable at the untenured ranks, where the need to prove one's ability in both teaching and research is a vital element in ensuring the quality of the research university. At senior levels, however, adding flexibility to the reward system would contribute energy and commitment to the institution at no cost: Since these individuals are tenured, it makes sense to use them in ways they prefer, rather than subject them to reward criteria no longer applicable to their situation. As *quid pro quo*, the rewarding of teaching should be accompanied by performance evaluations, based on review by peers who would apply standards as rigorous as those applied to research.

Another benefit of this reform would be to increase the undergraduate teaching done by senior faculty, thus reducing faculty-student estrangement and facilitating the transmission of academic values within the campus community. There would be positive repercussions beyond the research university, insofar as it is a trendsetter for American education. Thus, for example, elevating the

importance of teaching (including heightened professorial awareness of curricular matters, academic assessment, and teaching) would stimulate improvements in the quality of high school education, the value of the high school diploma, and the attractiveness of K-12 teaching as a career.

The enhancement of teaching in the research university would set an example for other universities and colleges, many of which support research programs in order not to appear inferior in the eyes of students and alumni. Such institutions—which number in the many hundreds—should be confident that their teaching contribution (often superior to that of research universities) is fully appreciated within the value system of higher education. Coming from the research university, a declaration to this effect would appear hypocritical. Rather, in the spirit of enlightened self-interest, the research university should lead the way by restoring the balance between undergraduate teaching and its other missions.

### Conclusion

We have proposed several changes that should help renew the functional equilibrium upon which rests the cultural integration and vitality of the American research university. To the extent that these reforms involve greater curricular interest and teaching on the part of tenured faculty, they would help repair the estranged relationship between faculty and students that is part of today's campus malaise. Thus enhanced, the prestige of undergraduate teaching becomes the basis for a modified reward system—one with implications at a national level for the organization of university-based research. This reform would introduce flexibility in the way tenured faculty satisfy their academic responsibilities. Instead of a research-or-nothing prescription, faculty could respond according to their own career rhythms. Letting faculty reduce their research effort—even temporarily—would relieve the pressure on funding, publishing, and other aspects of academic research. More important, it would remove the survival motive from research: For individuals and institutions alike, teaching would become a noble alternative. Nothing could assist

the research enterprise more than to give those who no longer wish to be involved a dignified way of moving into something of comparable importance. If, in that move, professors rediscover the satisfactions of teaching, then the restoration of equilibrium in the research university will be well on its way.

It appears that every generation or so, American higher education is impelled by both internal and external forces to change in quite fundamental ways. The last such transformation occurred in the decade following World War II. The success of the Manhattan Project demonstrated the potency of an alliance between academic research and the funding resources of the federal government. The successful responses by academic researchers to the challenges of Sputnik and polio are two examples of the myriad offspring of this marriage, which include achievements in all areas of the natural sciences, engineering, social sciences, and humanities. Recent publicized cases of scientific fraud and indirect-cost abuses do not for a moment threaten the federal government's commitment to the research university. Why? Because, in terms human, societal, and environmental, the need to understand is greater now than ever before in history. Like it or not, the United States is the only nation able to accept these challenges, which is why—whatever the public pronouncements—all parties understand that the government's role in research funding is necessary.

However, the continued greatness of the American research university depends on more than its relationship with government funding agencies. Not only its charter, but its record of success at doing what it does best—basic research and the training of the next generation of researchers—confirms that the research university's genius lies in preserving an equilibrium between the three missions of its charter—the propagation, creation, and application of knowledge. When that balance goes awry, the entire edifice rocks, and the educational neighborhood surrounding it rolls with the movement. The chances of collapse may be slight, but the dysphoria has gone on long enough. It is time to re-establish equilibrium, lest we come to believe that this is the way the world has to be. □