Moving Toward a Full-Service

Orientation to Higher Education

A More Helpful Way of Thinking About What We Do

It may be a while before most of us are comfortable with the notion that we run service stations. And many of us will find it only a bit less demeaning to conceive of our activities as functions of a service industry. Once we reconcile ourselves to the full implications of what counselors like Derek Bok, Ernest Boyer, Daniel T. Seymour are telling us, however, we'll notice that every task we turn to becomes not less important but more -- more worthy of the time and effort we devote to it, more worthy of being done with as much expertise and exactitude as we can bring to it.

With that perspective to guide us, let's take a closer look at the mission that now awaits American higher education.

During a 1975 commencement address at Johns Hopkins University, President Stephen Muller offered a memorable variation on a term one of his peers had coined during his days at the helm of the University of California. With apologies to Clark Kerr, Muller likened the modern research "multiversity" to a giant anthill in which scores of eager scholars were diligently boring away at the cutting edges of their own tunnels. Muller wasn't questioning the intrinsic value of the work he alluded to, and he certainly wasn't doubting its ultimate applicability to the realm beyond the anthill. He was merely depicting a situation in which impediments to communication and shared vision were making it progressively more difficult to hold a community together.

In all probability the complexities that gave rise to Muller's metaphor will multiply geometrically in the epoch that summons us forward. As the frontiers of knowledge expand beyond the final point at which the most brilliant polymath can comprehend a single discipline, it will become increasingly difficult even for specialists in the same subdiscipline to speak intelligibly to one another. It will thus be crucial for universities to cultivate and disseminate, at varying levels of technicality, the vocabularies that make sophisticated methodologies explicable and transmittable. By the same token it will be ever more important for what Boyer calls "the scholarship of discovery" to remain linked with the scholarships of "integration," "application," and "teaching."

Above all else, teaching must be kept in close alignment with the research that is exploring new

territory. It is teaching, after all, that maintains the supply lines essential to advanced scholarship, and any interruption in the flow of equipment and reinforcements will eventually be fatal to the enterprise. That being the case, it's fundamental for everyone to understand, and live by, the principle of interdependency that underlies and sustains an education community.

From this principle a number of things follow. One pertains to the teaching that occurs in a leading university. The scholars who conduct cutting-edge research know that they must convey their methods and findings not only to their fellow specialists in other institutions but also to the junior colleagues, graduate students, and mature undergraduate students in their own institution. If their findings are of sufficient import to affect the contours of the discipline as a whole, research scholars will also see it as their responsibility to be sure that accurate accounts of their work are included in the textbooks and other materials that will be used to introduce their discipline to lower-division undergraduates, secondary school teachers, and secondary school students.

Another pertains to the teaching that occurs in other college and university settings. Those who are not doing penetrating research in a particular aspect of a discipline they teach will want to know, as early as possible and in as much detail as possible, what that research entails and what it has disclosed that may be pertinent either to their own scholarly pursuits or to the way they present the discipline to their students. Meanwhile they will want to share with their students as much of the research as will be relevant to them. They'll want to be especially sure that mature students have access to detailed presentations of it, so that if they later choose to join the same research "expedition" or a related one they'll have the knowledge and skills to do so.

A third pertains to the teaching that occurs in precollegiate settings. Here an instructor will want only as much information about a particular piece of research as will be needed for his or her own professional edification. Beyond that, what such an instructor will find most useful is guidance about what his or her students need to know, and be able to do, in order to proceed to more advanced levels of a given discipline.

Now it might seem that the teaching in a high-level doctoral program and the teaching in a precollegiate classroom have little or nothing to do with one another. But in fact, as we've been reminded by comparisons with the instructional systems in countries such as Germany and Japan, they have everything to do with one another. What students are capable of learning and doing at the upper levels of a pedagogical hierarchy is largely dependent upon how far they've been able to get during the earlier stages of their schooling. Similarly, what teachers at the lower levels of a pedagogical hierarchy are capable of conveying to their students is dependent upon how much knowledge and ability they've acquired under those who supervised their instruction.

We've known for some time that many of the teachers in our elementary and secondary schools are not properly trained in the subject areas they're assigned. In a *New York Times* column for July 12, 1992, Albert Shanker, President of the American Federation of Teachers, quotes a National Assessment of Education Progress (NAEP) report indicating that "Fewer than half of the people who spend some of their time teaching math majored in math, and only a little more than half (54 percent) of the people who spend some of their time teaching science majored in

science. For people whose primary responsibility is teaching math or science, the percentage of majors rises, but it is still not impressive: 47 percent for math teachers and 66 percent for science teachers." It's no cause for amazement, then, that "only 5 percent of 17-year-olds can do what NAEP considers graduation-level work in math, and only 9 percent have attained a level where they understand and can use relatively sophisticated concepts in science."

According to *Everybody Counts*, a publication of the National Research Council of the National Academy of Sciences (Washington: National Academy Press, 1990), "Three out of every four Americans stop studying mathematics before completing career or job prerequisites. Most students leave school without sufficient preparation in mathematics to cope with either on-the-job demands for problem-solving or college expectations for mathematical literacy. Industry, universities, and the armed forces are thus burdened by extensive and costly demands for remedial education."

Given these facts, it's not surprising that Americans are now a minority in U.S. graduate programs of mathematics. "As Americans drop out of mathematics, international students converge on the United States to study mathematics-based subjects. What our own students see as a burden, students from other countries see as an opportunity. The result is that American graduate schools in mathematically based fields are enrolling ever higher percentages of international students," with a ratio of "as many as three out of four" in our very "top graduate programs."

The authors of *Everybody Counts* find some good in the situation they describe. "As a nation of immigrants," they say, "we should welcome the opportunity to be the schoolhouse to the world. Excellent programs -- the best in the world -- attract the ablest students from around the world, especially from Third World nations where opportunities for advanced study are limited. Many international students remain in the United States to contribute to our research efforts; others return to help raise the mathematical standards of their own countries as ambassadors of American education," so that "the cause of mathematics is advanced and the insularity of America from the rest of the world is reduced." But they point out on the down side that "mathematics departments in universities -- more than any other departments -- rely on graduate students to teach undergraduates. International graduate students rarely make ideal teachers for American freshmen, for reasons of language, tradition, and background." They "cannot serve easily as role models" for U.S. undergraduates, and one result is that they inspire few American collegians to pursue advanced work in math and math-intensive subjects.

> Were it not for the large numbers of international students who study and teach in the United States, the state of U.S. mathematics -- and science -- would be in total disarray. Under current circumstances, most universities have little choice but to employ international graduate students as teaching assistants. Their budgets are not nearly sufficient to staff undergraduate classes with Ph.D.'s; even if they had enough money, the United States does not have enough mathematics Ph.D.'s to fill all college and university positions. As long as universities employ graduate students to teach undergraduates, the best way to improve mathematics instruction for university undergraduates is to recruit more well-qualified American students to graduate study in mathematics.

That sounds like a good plan, but another study conducted under the same auspices, *Moving Beyond Myths: Revitalizing Undergraduate Mathematics* (Washington: National Academy Press, 1991), suggests that it will be extremely difficult to implement. One reason is that, far too often, college and university instructors "present mathematics as a dry subject to be learned by imitation and memorization." Another, related to it, is that those who major in math and become elementary and secondary school teachers "embark on their careers with serious deficits of preparation in broad areas such as curriculum development, problem-solving, and connections between mathematics and other disciplines." They leave college ill equipped to do their part in starting the supply-lines that need to commence in America's precollegiate institutions.

> Despite widespread efforts to establish effective standards for curriculum and instruction in school mathematics, undergraduate mathematics programs frequently perpetuate modes of delivery that are ineffective for most students and choices of content that are inappropriate for most prospective teachers. Only when college faculty begin to recognize by deed as well as word that preparing school teachers is of vital national importance can we expect to see significant improvement in the continuity of learning between school and college.

For a number of reasons it would be to the advantage of America's colleges and universities to improve the way they teach mathematics at the undergraduate level. For one thing, they could attract more American students into graduate math programs and thus begin to offset our nation's alarming dependence on foreign nationals both as mathematics scholars and as mathematics instructors. For another, they could draw more American youngsters into undergraduate majors in mathematics, science, and engineering, and thus into the growing number of strategically important career fields that require mathematical proficiency. For a third, they could produce more elementary and secondary school teachers with proper preparation in mathematics and in the pedagogical techniques that have been shown to be most valuable in presenting it to pupils.

In the words of *Everybody Counts*, "Everyone depends on the success of mathematics education; everyone is hurt when it fails." Mathematics exceeds all other subjects as a roadblock to "scientific and professional careers," and it is also the worst "curricular villain" in driving students to fail in school and eventually to leave school altogether. If we really live up to our claim to be "a society committed to equal opportunity," we'll do what we can to turn mathematics into "a pump rather than a filter in the pipeline of American education." We'll make sure, in other words, that "everybody counts" in all the senses that make a difference.

The New Pedagogy

The bad news so far is that higher education has been slow to introduce the alterations in its own instructional programs that would change things for the better. The good news is that some heartening signs are on the horizon.

For example, educators in this country have now discovered that it is in fact possible to teach

math and other subjects successfully even to people who've long been thought of as incapable of mastering complex material. Since the publication of *Involvement in Learning: Realizing the Potential of American Higher Education* (Washington: Department of Education, 1984), we've had little excuse for not knowing that students profit most from experiences that encourage their active participation in the learning process. "All too often," we're told in *A New Vitality in General Education* (Washington: Association of American Colleges, 1988), "our operational assumption as teachers is that learning takes place when we talk. But students learn when they talk to themselves and to others." In accordance with the recommendations of the new *Mathematics Curriculum and Evaluation Standards* produced by the National Council of Teachers of Mathematics and published in 1989, many teachers are now deploying "constructivism," an approach that motivates students to "construct their own knowledge by wrestling with personally engaging problems" (David Stipp, "Reinventing Math," *Wall Street Journal*, September 11, 1992).

It turns out, too, that students learn much faster when they collaborate on projects. By paying close attention to how Berkeley undergraduates studied, Uri Treisman noted that one key to the success of the Asian-Americans in his classes was that they worked together on their assignments. He encouraged his other students -- including some underachieving African-American and Hispanic-American youth -- to try the same study methods, and their performance improved dramatically. The lesson Treisman derived from all this is summed up in *Everybody Counts*:

> Competition and individualism, ingrained parts of traditional American culture, are reflected in typical mathemantical courses where students work alone to solve set problems. Other cultures, including many which are now a growing part of the American scene, stress teamwork and group problem-solving. To the extent that mathematics instruction in the United States continues to stress individualism and competition over cooperation and teamwork, to that extent we continue to introduce unnecessary counterproductive practices for many in our multicultural nation.

Another of Treisman's conclusions -- reinforced by the example of Jaime Escalante, a Los Angeles mathematics teacher who has become famous because of the remarkable success his economically and culturally disadvantaged, predominantly Hispanic-American and African-American students at Garfield High School have had on the Advanced Placement calculus examination -- is that expectations have a great deal to do with academic achievement. Setting high standards and communicating high expectations, particularly when students are measuring their efforts against objective criteria rather than against the grades being given to other students, can have revolutionary consequences.

In *What Works: Building Natural Science Communities -- A Plan for Strengthening Undergraduate Science and Mathematics* (Washington: National Academy Press, 1991), the authors of Project Kaleidoscope extend these findings to what they call a new "Learning Model."

> The prominence of the community of learners in the experience of science learning at liberal arts colleges indicates that it is one important component of effective science education. We are also impressed with the frequency and power with which lack of com-

> munity has been emphasized by recent studies as a crucial shortcoming in college learning. Learning, motivation to learn, and the practice of science are all deeply social phenomena. We reject models that conceive of learning as a constant test put to isolated and beleaguered individuals who are thereby winnowed so that only the strongest and brightest remain. An able scientist becomes that not because of endowments conferred at birth, but because others cared enough to nurture and inform that person and enmesh him or her in a healthy social interaction that created a sturdy sense of identity.

According to *What Works*,

> The implications of "community" for institutional and departmental policies are profound; they reach to architecture, study arrangements, access to facilities, grading standards and policies, campus life, opportunities and arrangements for research, visiting speakers, seminar programs, displays in the department, internal communications, involvement of students in educational policies, teaching loads, and sectioning of courses and laboratories. For individual faculty, implications include new attention to grading assumptions, homework assignments, and laboratory exercises, course emphasis on the social context for science and scientists, and arrangements for office hours, help sessions, tutoring by upper-class students, and testing.

One of the things that militates most vehemently against a sense of "community" is the practice known as "grading on the curve." One student interviewed by the authors of *What Works*

> commented that you could be a B+ and know that you had mastered nothing; you could be "totally fogged" on what it meant or how it applied or why it worked, yet have gotten by quite well by memorizing the tidy manipulations needed to solve problems. Furthermore, grading on the curve was seen as the enforcer of the banal and degrading "culture of competition." It made learning into a zero sum game. It stifled the impulse to get together with one or more classmates to discuss and work over the course content, labs, and problems, because curved grading has a quota of high grades. If your neighbor does better, you do worse.
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> The alternative, which demands more thought by faculty, is to assign grades on the basis of an absolute assessment of competence. But all are in the game together: it is the whole class -- including the instructor -- as a community trying to understand nature.

Other educators are also questioning the use of a grading curve. In "Measuring Up" (*American Agenda*, Fall 1992), Marc S. Tucker says that "The whole American education system, as I now see it, is dedicated to throwing bell curves around kids. Psychologists of the 1920s told us that intelligence is normally distributed on a bell curve, and they also told us that achievement is a direct function of intelligence, and therefore it follows that achievement is distributed on a bell curve. Our whole system is designed to sort kids out."

One might think that doing away with the curve is tantamount to doing away with rigor. But

that's not so. Quite often getting rid of the curve has precisely the opposite effect: it raises the ante for the whole class. That's why Tucker says "I want national standards, because our standards now are lower for poor kids. I want higher standards for everybody."

Higher standards for everybody. Tucker's phrase encapsulates an idea that's anchored the reform agenda for the last decade.

It's a philosophy that combines "equity and excellence," to use the wording preferred by Diane Ravitch, Assistant Secretary for Educational Research and Improvement at the Department of Education. As Harold Wechsler observes in *The Transfer Challenge: Removing Barriers, Maintaining Commitment* (Washington: Association of American Colleges, 1989), it provides a way to wed "quality and equality."

In Ted Sizer's terminology, it's the formula for a "school 'tone' that stresses the values of 'unanxious expectation' and of 'decency,'" so that when students are asked questions in class it's never to put them down for what they don't know, but always to give them openings for "exhibitions of mastery" (quoted by Barbara Hall in "The Essential Theodore Sizer," *Washington Post*, August 7, 1992).

It's a pedagogy conducive to the aims of what Benno Schmidt describes as "a good and a just society," a civilization that exalts education as an instrument "to heal divisions" and keep "hope" and self-realization alive (from remarks at the National Press Club in Washington, September 17, 1992, where the former President of Yale helped launch the Edison Project, an ambitious plan to dot the nation with what a member of the audience labeled "Whittle red schoolhouses").

It's an attitude to the maturation experience that not only accepts but celebrates America's character as "a rich, vibrant mosaic," to appropriate a happy image from *The English Coalition Conference: Democracy Through Language* (Urbana: The National Council of Teachers of English, co-published with the Modern Language Association of America, 1989).

And of course it's a concept of instruction that's universally acknowledged as the key to our achieving the "National Education Goals" adopted by President Bush and America's governors in their Charlottesville conference of September 1989.

To create the citizenry this nation will need in the twenty-first century, it's been rightly assumed that our initial task is to define nationwide standards in such core subjects as English, mathematics, science, history, and geography. It's been gratifying to see those standards being drafted and disseminated by the proper professional organizations. But it's also been reassuring to observe that no one authentically committed to working toward "world-class" performance in accordance with the timetable promulgated under the *America 2000* strategy has been unaware that attaining higher levels of student achievement would require a radically new type of classroom in what the Department of Education has called "a New Generation of American Schools."

More than anything else, today's pedagogy embodies the pivotal recognition that "The focus of

schooling must shift from teaching to learning," as we read in *A Nation Prepared: Teachers for the 21st Century* (Washington: The Carnegie Forum on Education and the Economy, 1986). It repositions the teacher, so that where there used to be an all-controlling authority figure many classrooms are now being conducted by somebody who's a fellow explorer -- a more seasoned colleague, as it were -- whose function is to circulate among students like the leader of a scouting excursion, or like a coach "helping prepare kids for the Olympics," to cite a couple of Al Shanker's analogies (the first from a September 1992 *Washingtonian* interview, the second from a "Here We Stand" column that appeared December 6, 1992, in the *New York Times*). Since our objective is to promote active inquiry rather than passive reception, the role of the contemporary teacher is not to lecture like a know-it-all, and not to manipulate pseudo-discussions as if the younger participants were a virtuoso's puppets, but to stimulate and refine alert intellects. The ideal teacher is a catalytic converter, an agent who sparks reactive minds to the transforming and clarifying connections that signal new bursts of autonomy, creativity, and liberating insight.

Is this kind of educator new? Not according to Ted Sizer. In a *Wall Street Journal* interview for September 11, 1992, he points out that the concept behind interactive instruction "goes back to Socrates in the garden. A dialogue in which the great philosopher asked questions, the pupil responded, the philosopher took that response, gave it a spin, and threw back more questions. The pupil was always active. Socrates didn't say, 'This is what you should know and believe. Listen and take notes.'"

Sizer traces a lot of reform pedagogy to John Dewey, who opposed the notion that "the mind is an empty slate rather than a muscle to be exercised." Dewey's view was "that the child learns from experience. The child engages with ideas that interest her, and in that process of engagement, learns." In his foreword to the MLA/NCTE report on *The English Coalition Conference*, Wayne C. Booth also alludes to the educator who applied pragmatic philosophy to instruction.

> Active learners, not passive receivers: such language obviously is not brand new in our educational history. But the echoes in that language of John Dewey and other "progressive" theorists should not lead any reader to see us, as some of our critics have suggested, as falling back into the tired formula, "Teach the child, not the subject." To do so would be to engage in precisely the kind of polar thinking that has plagued too much recent criticism of the schools. We do not choose between "the child" and this or that ideal "subject." We choose subjects which, by their nature, if taught properly, will lead the child eagerly through increasingly independent steps toward full adult, self-sustained learning.

That definition of what assessment specialists refer to as a desirable "educational outcome" would be hard to beat. It echoes some remarks in *A Nation Prepared*, where we are told that the twenty-first century, even more than the twentieth, will require "humane and caring people," "people who have the tools they need to think for themselves, people who can act independently and with others, who can render critical judgment and contribute constructively to many enterprises, whose knowledge is wide-ranging, and whose understanding runs deep." And it calls to mind that same report's admonition that

> If our standard of living is to be maintained, if the growth of a permanent underclass is to be averted, if democracy is to function effectively into the next century, our schools must graduate the vast majority of their students with achievement levels long thought possible for only the privileged few. The American mass-education system, designed in the early part of the century for a mass-production economy, will not succeed unless it not only raises but redefines the essential standards of excellence and strives to make quality and equality of opportunity compatible with each other.

There are many intervals between the instructional transactions that occur in our institutions of higher education and the interchanges characteristic of a society that "strives to make quality and equality of opportunity compatible with each other." And of course there's little we can do to affect those intervals. But if we bring "total quality" to the "equality of opportunity" we seek to cultivate in our own demesnes, we may be pleasantly surprised by the abundance our orchards yield over time. Who knows? If enough of us do our jobs right, the millennium may one day arrive when America really *can* pledge "liberty and justice for all."

Higher Education and the Quest for

Better Instruction for Everybody

A Real Answer to the Nation's Call for More Demanding Standards

It's no longer debatable that a decent life for the people of this country can only be attained through a pedagogical system with "higher standards for everybody." It's now demonstrable, moreover, that "everybody" has to mean *everybody*.

We're an increasingly multicultural society; demographers tell us that "minorities" will constitute the U.S. majority, and thus the core of our workforce, by the middle of the next century. We're also becoming a more senior society; citizens who are eligible for retirement payments under current Social Security arrangements will continue to proliferate in proportion to -- and thus impose heavier and heavier burdens upon -- the republic's traditional employment-age population. Meanwhile we're becoming an ever more interdependent society; our lives are less and less insulated from what happens, or doesn't happen, in what we once thought of as remote portions of the globe.

What all these trends indicate is that we're compelled to abandon many of the assumptions that have brought us to where we are today. If we hope to secure the kind of future we'd prefer for ourselves and for our children, we simply have to live more intelligently, economically, equitably, and compassionately than we do at the moment. We can't afford to keep destroying or wasting so much of what we depend upon for sustenance. And we certainly can't permit ourselves to continue behaving as if the lives and livelihoods of some people don't matter.

To put the case another way, if we want to avoid seeing the American dream snuffed out by a suffocating incubus, we have to ensure that our polity's benefits -- and the prerogatives of citizenship that accompany those benefits -- are extended to segments of our populace who've tended to miss out on the nation's plenty. If we're going to need workers who can lift themselves and others by state-of-the-art bootstraps -- to update a proverb we used to hear from Martin Luther King, Jr. -- we'd better guarantee that everyone's footwear is equal to the strain.

To bring about the society America has to become, our most fundamental task is to establish a real educational system -- one that's built on explicit criteria for rigorous performance at every level of every instructional hierarchy, and one that provides suitable means for everyone on

every pedagogical ladder to meet those criteria. This is a tall order, and there's small comfort in the knowledge that few if any previous civilizations have fulfilled it with total success. It may be a saving grace for us that it actually *is* an order. If we're forced to acknowledge that we don't have any acceptable alternatives, and if we lack for nobler motives, we may at least be able to evoke the will to proceed on what our instinct for self-preservation induces us to do.

But what exactly do we mean when we speak of a "real educational system"? What would such a creature look like?

First, an educational system worthy of the name would be truly *national*. As Al Shanker notes in the September 1992 *Washingtonian*, "Successful countries have a basic curriculum that enables teachers in every grade to know precisely what they're accountable for. In the U.S. we have 15,500 separate school boards. No teacher knows just what the students learned last year," especially when many of the youngsters in a given class will have spent the year before in another school district. Diane Ravitch writes to similar effect in an op-ed piece for the *Washington Post* (September 15, 1992). "The absence of clear standards has contributed to the inequities and incoherence of American education. Some students get the courses that prepare them for college or good jobs while others do not. Teacher education varies wildly in quality, since expectations are undefined. In the absence of a clear national consensus, textbooks and tests define what students are supposed to know and be able to do. This incoherence undermines the quality of American education, misdirects resources, reinforces unequal educational opportunity, and institutionalizes low expectations." In these comments Shanker and Ravitch are speaking primarily about the need for curricular predictability in precollegiate instruction; but both would agree that a coherent precollegiate system is unthinkable without a cohesive and vertically articulated postsecondary system to complete it, reinforce it, and keep it replenished with teachers and other personnel.

Second, a real educational system would be *rational*. It would bring the most cogent research and analysis to bear upon the problem of organizing and managing a nationwide complex of coordinated pedagogical programs, and it would make available a logical and smoothly flowing route network with the wherewithal to convey any student, at any time, from a specified point of origin to a full menu of possible destinations. It would offer clear, readable guidelines on how to move from A, B, or C to X, Y, or Z. It would also define the various intervals along any route, with uniform measures of the proficiency increments required for progress from one station to the next. Of equal importance, it would be supervised in such a way as to detect and correct malfunctions or inefficiencies in any of its operations. In other words, it would include an intelligently designed structure of assessment and improvement procedures, one to gauge the movements of each of the network's individual travelers, another to compare the paces of different categories of travelers, and still others to test and constantly upgrade the effectiveness of the network itself in all its aspects.

Third, a real educational system would be *accessible*. It would be as user-friendly as a thoughtfully planned transportation network. It would be readily decipherable by everyone who wanted to use it, with adequate provisions for communicating its potential itineraries and explaining its

schedules and fares to any person prepared to enter it at a given location. It would also be affordable to all comers, with appropriate assistance for qualified travelers who'd otherwise be barred from availing themselves of its services.

Fourth, an educational system that really fit America would be *malleable*. It would remain open to expansion, contraction, rerouting, and other adjustments to keep it current. It would have the flexibility and adaptability of a modular assembly of electronic and mechanical elements.

In many ways the system we want would need to be organic. It would have to evolve with the nation. Perhaps we'd do well to think of it as analogous to a vascular, endocrine, or neural system -- an indispensable counterpart to the other components of a dynamic body politic, but one that's at its best when it calls least attention to itself.

To do its work properly, a strong educational system would need to be as self-contained and all-encompassing as possible within its own sphere of responsibility. It wouldn't perform harmoniously if the instruments essential to its operation were not included in its internal governance; it wouldn't meet the expectations of those who relied upon it if collateral directives from without were permitted to subvert the authority of those commissioned to oversee its activities from within. At the same time, however, it wouldn't be able to play its role cooperatively if it weren't fully integrated with the body's other functions, and if it weren't firmly but tactfully guided by the same mind and spirit that presides over them.

Happily, many of the prerequisites to a comprehensive instructional system are already in place. It's now widely acknowledged, for example, that the National Center for Education Statistics (NCES), a division of the Department of Education's Office of Educational Research and Improvement (OERI), is doing the reconnaissance basic to such an entity. The charge of NCES is "to collect and analyze, and disseminate statistics and other data related to, education in the United States and in other nations." Through publications such as its annual review of *The Condition of Education*, its periodic *Projections of Education Statistics*, and its compilations of information like the *Characteristics of Doctorate Recipients: 1979, 1984, and 1989* (Washington, 1992), the NCES provides convenient digests of key trends in America's schools, colleges, and universities.

Then, of course, there are the studies of particular topics that emanate from the Office of Educational Research and Improvement. Under the patient eye of Clifford Adelman, OERI has produced a valuable series of longitudinal analyses, among them such recent contributions as *A College Course Map: Taxonomy and Transcript Data Based on the Postsecondary Records, 1972-1984, of the High School Class of 1972* (Washington, 1990), *The Way We Are: The Community College as American Thermometer* (Washington, 1992), and *Tourists in Our Own Land: Cultural Literacies and the College Curriculum* (Washington, 1992).

Meanwhile, the National Goals Panel, created by the National Governors Association to further the objectives agreed upon at the 1989 "Education Summit," now issues a yearly *Goals Report* to help everyone keep track of what the states are doing to make America "A Nation of Learners" by the year 2000.

When we include the data processed on a regular cycle by federal agencies such as the National Assessment of Educational Progress, the Bureau of Labor Statistics, and the National Commission for Employment Policy -- and when we then add all the material gathered and sifted so ably by the dozens of college and university federations, professional associations, and policy institutes that represent particular educational constituencies -- we realize that we're blessed (some would say cursed) with huge inventories of information.

As critical as such material is, however, it's only the most elementary prerequisite to the kind of pedagogical system America yearns to install. Of far greater importance are the mechanisms for constructive deployment of educational data. That's why it's encouraging to observe the vast repository of knowledge and expertise in the organizations that help collect and collate instructional information. A number of these organizations are so extensive, and so redoubtable in the domains defined by their networks, that they could almost be thought of as prototypes of the meganetwork now struggling to be born.

In recent years a few of the nation's most prominent associations and institutions have been depicted by their adversaries as obstacles to the revamping of American education. Without inquiring into the reasons for or merits of such portrayals, we can probably assert without fear of contradiction that the climate to which this kind of blame-throwing has contributed so much smoke and obfuscation has made it hard for all the parties who'd gain from improving the nation's schools, colleges, and universities to combine forces against the ills that beset them. In the time that's been devoted to internecine recrimination a lot that might have been done to further the cause of pedagogical renewal has been left undone, and it should now be obvious that none of us can afford the costs that would accompany any further retardation of the task at hand.

No, we'll all be better off if we set aside our remaining disagreements and bind up the wounds that have impaired our collective prowess. And one gesture to that end would be for everyone to acknowledge that any organizations that have been deprecated as symptomatic of the problem are, by the same line of argument, essential to its resolution.

It might be said, in fact, that if we'll merely adjust our focus we'll find ourselves in the presence of an answer to many of our difficulties. A glance at the record will disclose that the fissures that have scarred so much of our instructional landscape have not prevented joint endeavors from moving forward in one locale after another. Every educational institution of any magnitude, and virtually every major association of pedagogical institutions or personnel, has participated in some aspect of the reform effort. Most have made it clear that, given the normal incentives and protections, they're not only willing but eager to be enlisted in more ambitious undertakings. They've demonstrated by their own deeds that they're capable of subordinating their private interests, narrowly construed, to higher aims. In short, they've shown that they're more than ready to offer their services to a campaign that will elevate American education to the position it seeks to occupy by the advent of the twenty-first century.

Together these organizations constitute a rich reservoir of energy, talent, and, yes, patriotic fervor. They're comparable to what physicists refer to as a supersaturated solution, and all they

lack is the droplet that would finally conjure definition out of diffusion. A few molecules of the right composition -- a few manifestations of enlightened leadership -- could almost instantly coalesce them into a crystal of astonishing elegance and conductivity.

Let's hope it's not long before such a transfiguring moment occurs, because what American education needs most right now is the sense of mutuality, the clarity and commonality of purpose, that would spring from a galvanic infusion of vision.

That vision would have to be national, and in many respects international, in scope. It would have to embrace the whole of a society that becomes increasingly multifaceted by the day. It would have to permeate every corpuscle of the instructional enterprise. And it would have to devote due attention to all the nation's pedagogical institutions, from the humblest pre-school to the busiest center for occupational retooling and the most esoteric institute of postdoctoral research.

The kind of vision postulated here -- a unitary perspective that takes in every aspect of American education -- would provide the auspices under which representatives of the nation's schools, colleges, universities, and vocational-technical programs could formulate and periodically review the curricular content and proficiency expectations appropriate to every level of instruction and to every subject field across the spectrum. It would enable panels of recognized authorities to develop guidelines for the textbooks and technologies best suited to particular settings. It would permit designated research scholars to determine the assessment techniques most appropriate for different styles of presentation and different types of learning. It would help postsecondary institutions calibrate their career-preparation programs more exactly with the certification criteria for various professions. And it would make it possible for the nation's leading educators to correlate, standardize, and codify the accreditation procedures America needs to ensure that every instructional organization in the country is evaluated regularly and rigorously and is continuing to fulfill its licensed mandate.

It's obvious that a precision-engineered pedagogical system would require a steady hand at the helm. The only question, to quote a vivid clause from George Washington University's President Stephen J. Trachtenberg, is whether the wielder of that hand -- "the federal government, and the United States Department of Education in particular" -- would "have to shed its velvet gloves and reveal its iron fist" in order to mold and then maintain its hold over such a vehicle.

The history of earlier reforms in other areas of American life would suggest that new laws and regulations will need to be placed on the books before a genuine transformation can occur in U.S. education. That same history would suggest, however, that those laws and regulations will be limited in their efficacy if they contribute to the bureaucratic sclerosis that now clogs many of our instructional arteries, and if they're imposed too precipitously, autocratically, or forcibly from the top. The strategy that would seem most likely to yield and conserve the results we really want, therefore, would be one that relies primarily upon "velvet" tactics -- inviting "a spirit of willing cooperation," to quote Trachtenberg again, and proffering meaningful rewards to those who respond in a reciprocal spirit -- and one that resorts to the "iron fist" reluctantly

if at all, and then only after good-faith efforts to solicit voluntary participation have been spurned.

One argument in favor of a federal policy that gives the upper hand to a gentle disposition is that this mien would be most compatible with the Total Quality Management philosophy a vital educational system would depend upon to operate concordantly and to remain fresh and supple over time. If it does adopt this approach, the Department of Education would be well advised to continue emphasizing the inclusionary principles that foster communication and encourage the formation of partnerships. Recognizing that everyone would benefit from a concerted endeavor to seed the nation's schools, colleges, and universities with supervisors who listen, and ask questions, and listen again before they reach decisions and begin implementing them, the Department should do everything it can to nurture an open, congenial atmosphere. It should use its influence to hasten the day when demanding but considerate administrative practices prevail at every stratum of the instructional hierarchy. And it should make the most of its good offices to condition everyone everywhere to remember that there's no such item as an isolated problem -- that any activity or inactivity that disrupts or debilitates the smallest function of America's pedagogical system weakens the whole system, and the republic, in ways that can be incalculable.

What Higher Education Can Do to Enhance the Nation's Instructional Capacity

Since America's postsecondary institutions comprise but one untidy subsystem of a frequently chaotic pedagogical complex, it would be unreasonable to ask them, and the associations that represent them, to try remedying all the defects in a broader embroidery of instructional institutions. It would not be unreasonable, however, to suggest that they apply their resources to the analysis of those defects, and to the initial phases of treatment for any flaws that lie within, or connect with, their own purviews. By doing so they'd help themselves, and they'd also be doing their part to ready U.S. education for the systemic integration it expectantly awaits.

To begin with, even the most highly regarded of our institutions would be wise to submit themselves to the kind of self-appraisal Princeton has just set in motion. In a recent editorial (December 22, 1992), *The Washington Post* commends the multi-campus University of Maryland for its decision to "reconfigure or discontinue almost 100 academic programs" in an attempt to reduce "its duplicate programs, its marginal degrees, and its unproductive faculty." Meanwhile *The New York Times* (December 8, 1992) reports that Chancellor W. Ann Reynolds "of the City University of New York is pressing for an overhaul" of that 19-institution conglomerate, one that would dissolve or consolidate some academic offerings "so the university could improve and expand others." According to the *Times*, "A central element of the plan is a strategy to raise the level of programs at some colleges by eliminating similar programs at other colleges, thus concentrating resources in fewer places." Like the Maryland project, the CUNY reorganization is "already provoking anger among faculty members who say that they would be forced to transfer or travel from one campus to another for certain jobs or majors, and that the singular strength of each campus would be diluted under the proposal." There would also be inconven-