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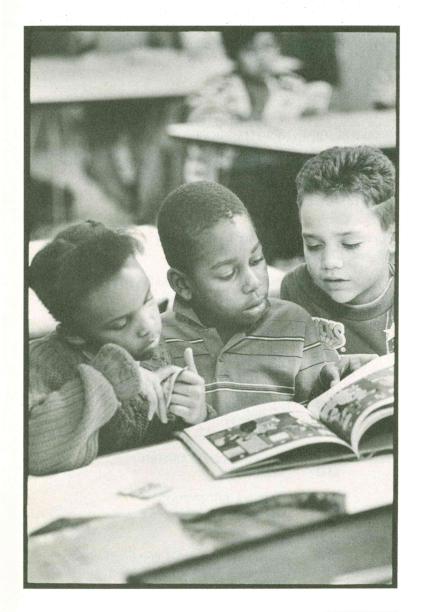
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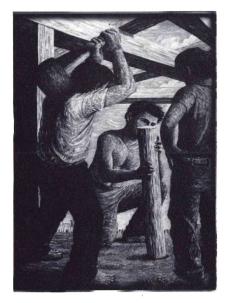


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Painting by Jon Imber.

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The New England Board of Higher Education was established as a nonprofit agency by the New England Higher Education Compact, a 1955 agreement among the six states that was authorized by the U.S. Congress NEBHE's purpose is to advance and develop programs that encourage higher education opportunities and improve efficiency in the use of resources among New England's public and independent colleges and universities.

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We do not customarily use this space to talk about the "back of the book." But two items near the end of this issue of CONNECTION warrant attention.

First, note the Campus department, which begins on p. 47. Each quarter, Campus captures the collective verve of New England higher education with news on grants, new programs and other key developments from literally dozens of the region's colleges and universities: A University of New Hampshire scientist wins federal funding to develop sweeter, healthier strawberries ... Middlebury College overhauls its undergraduate curriculum ... Naugatuck Valley Community-Technical College establishes an Alternative Fuel Vehicle Technology Center to help the state comply with federal clean air legislation ... University of Rhode Island researchers seek new methods to detect mines under the sea ... the Massachusetts Institute of Technology introduces an intensive course on technical Japanese for materials science engineers ...

Campus is an unusually egalitarian place where a National Science Foundation grant of \$74,731 to Elms College for faculty research into thyroid deficiencies is worth the same space as a \$20 million donation to Harvard University from a wealthy alum.

Moreover, education and economic trends tend to be expressed in broad assertions; Campus backs up those assertions with specifics. For instance, publications such as CONNECTION have noted that colleges and universities are stepping up efforts to improve K-12 education. This issue's Campus department offers readers some concrete examples: Brown University, Hampshire College and the Brown-based Coalition for Essential Schools are bringing high school teachers to campus to help them integrate math and science classes and move away from rote drills and memorization. Bowdoin College is developing interactive three-dimensional animation to help teach biology to high school students. The University of Connecticut is working on ways to improve calculus instruction in high schools across the state. And Dartmouth College is collaborating with New England Telephone and NYNEX to develop an educational network linking campus facilities to area schools, libraries and museums.

Campus also provides context for the points advanced in CONNECTION's more cerebral Cover Stories and Commentaries. For example, what precisely are New England's colleges and universities doing to respond to the new realities of work and the workforce — the focus of this issue's Cover Stories? Some are introducing new academic programs in specialized fields. This issue's Campus reports on new academic offerings from a bachelor's degree program in architectural engineering technology at Vermont Technical College to a doctoral program in environmental studies at Antioch New England Graduate School — and more.

If Campus offers a snapshot of New England higher education, the other item in the back of the book — Seven Years of CONNECTION — provides a long view of the evolution of New England's higher education-economic development nexus. This seven-year index of CONNECTION articles begins on p. 52.

The index reveals the persistence of some of the tough problems facing New England as well as the changes that have swept the region and the higher education landscape since the journal's debut in 1986. Articles from the journal's first year of publication, for example, focus on topics that still nag New England, such as rising college costs and the underrepresentation of minorities at the region's colleges and universites, but also on the superpower arms race and "Remarkable Growth in State Support" of New England higher education.

Notably, the index also reveals that work and the workforce has occupied a prominent place in CONNECTION from the beginning. The problem, however, has changed. As recently as 1989, the journal explored the region's labor shortage. Now, of course, it's jobs that are in short supply.

The index is a tool. We urge you to mark it up, photocopy it, fax it to a colleague and, most of all, use it to order back issues of CONNECTION.

John O. Harney is the editor of CONNECTION

#### **Homesick Students**

When Congress reauthorized the landmark Higher Education Act last summer, New England higher education leaders lobbied successfully to remove home equity from the calculations used to determine eligibility for federal student aid. New England's inflated home values, they argued, put the region's students at a disadvantage in the competition for federal financial aid. But alas, the victory was short-lived for many students. Some of New England's private colleges and universities, it turns out, are still using home equity to determine their own institutional aid packages.

Lucia Whittelsey, director of financial aid for Colby College, says home equity is an important "indicator of financial strength." A home, she reasons, is an asset, "in the same way that a savings account is an asset." To give some relief to families with high home values, but low income, Colby's financial need analysis caps home equity at three times family income.

The variations in institutions' financial need analyses led to deep disparities in the awards offered to students in the spring. The result, according to college admissions officers: unprecedented, last minute negotiations with consumerist students and parents trying to cut the best deal.

#### **But Can They Teach?**

School reformers of various stripes have long scolded states for erecting barriers to classroom teaching by practitioners in fields such as math and science. But how far is the pendulum swinging in Massachusetts?

When Gov. William F. Weld recently signed major school reform legislation, the Massachusetts Teachers Association (MTA) was riled by the revision of a teacher education reform worked out four years ago — one which many colleges have already prepared for.

The "old" reform required prospective teachers to take a certain number of courses in education as undergraduates and earn a master's degree in a subject area within a specified time in order to be fully certified.

The new law does away with the master's degree requirement and places less emphasis on classroom experience and pedagogy by requiring only a bachelor's degree in liberal arts and completion of a 20-day training program for a "certificate of eligibility" to teach in a public school classroom, according to the MTA.

While the new law doesn't penalize teachers who have education degrees, it does belittle them by ignoring the professional training necessary to prepare for classroom teaching, according to MTA spokesman Jack Polidori. "It's a lowering of standards for admission into the profession."

#### Neither a Lender Nor ...

The stress on some college financial aid officers is building as the Clinton administration gets closer to making guaranteed student loans available "directly" to students through their institutions. Direct lending will cut private lenders out of the \$15 billion-a-year student loan program. It has been advocated by large, wellendowed institutions such as Harvard University, which already makes its own student loans and can easily switch to direct lending. But some smaller campuses fear the program will require new and expensive paperwork. "I don't know how we'd handle it," says Nelberta Lunde, director of the four-person financial aid office at St. Michael's College, where 65 percent of the 1,700 students receive federal loans.

#### Aaa-OK

Dartmouth College has joined the exclusive ranks of higher education institutions with Aaa ratings from Moody's Investor Service. In the spring, the service upped the college's credit rating two levels to the coveted Triple A. Only 11 other higher education institutions nationwide can claim Aaa ratings. They include the Massachusetts Institute of Technology and Harvard and Yale universities. Dartmouth's host state, incidentally, cannot make such a boast. The state of New Hampshire has an Aa rating from Moody's.

#### From the Frying Pan ...

The number of the nation's business school deans with corporate leadership experience is growing, according to the American Assembly of Collegiate Schools of Business (AACSB). Two years ago, only

about 20 of the 670 AACSB member institutions were led by deans fresh from corporate posts. As of May 1993, 28 business deans had gone straight from corporations to academia, according to an informal AACSB survey.

In New England, Louis Lataif, the former president of Ford Motor Co., Europe, was appointed to lead Boston University's Graduate School of Management; and Edward A. Fox, the former president of the Student Loan Marketing Association, now heads Dartmouth College's Tuck School of Business.

The increasing presence of corporate types in campus corner offices may be evidence that business schools are beginning to realize how far they've drifted away from the business world, according to Jay A. Halfond, associate dean of the College of Business Administration at Northeastern University.

But Halfond worries that the culture change could force a rude awakening on business executives unaware of "just how less responsive a university can be compared to a business environment." Says Halfond, "Managing people with tenure is a real challenge."

#### White House North

From the moment Bill Clinton and Al Gore won the White House, the two Southerners began looking to New England to fill key policy positions. A few administration officials and their old New England jobs:

- Robert B. Reich, secretary of labor (Harvard lecturer);
- Ira Magaziner, senior advisor for policy implementation (Rhode Island business consultant);
- Madeleine M. Kunin, deputy secretary of education (Dartmouth professor, former Vermont governor);
- Susan Tierney, assistant secretary of energy (Massachusetts secretary of environmental affairs);
- Anthony Lake, national security advisor (Mount Holyoke College professor);
- John M. Deutch, undersecretary of defense for technology and acquisition (MIT professor);
- Mollie Beattie, director of the Fish and Wildlife Service (former deputy

secretary of Vermont Natural Resources Agency);

- Eli J. Segal, director of National Service (Boston businessman);
- Philip Heymann, deputy attorney general (Harvard law professor);
- Drew Days III, solicitor general (Yale law professor); and
- Raymond Flynn, ambassador to the Vatican (Boston mayor).

#### **Not So Pompous**

What do the folks at the Massachusetts School of Law at Andover think about the typical law journal? Not much apparently. In April, the school unveiled its own MSL Law Review, promising an alternative to "one more pompous forum where law professors can talk to themselves about purely theoretical matters," and suggesting, "I hope you'll do something that most people rarely do with a law review. I hope you'll read it."

#### Taxing Nonprofits ...

Boston's higher education community has been mum on a long-shot mayoral candidate's proposal to require the city's colleges and universities to provide "lifetime job training" for Boston residents if the schools want to keep their tax-exempt status.

But former public television news anchor Christopher Lydon's proposal did come at a sensitive time for New England nonprofits. In June, the Massachusetts Legislature's Taxation Committee heard testimony on a proposal to allow local communities to tax nonprofits for up to 0.5 percent of the assessed value of their property.

Though the bill is likely to die in committee, state and local demands on New England's nonprofits are growing. The Boston Redevelopment Authority recently ordered Boston College to establish a scholarship program for city residents and donate a portion of ticket proceeds to neighborhood charities in exchange for permission to add 12,000 seats to its football stadium.

As the pressure from host communities grows, expect colleges and universities to step up the defense of their tax-exempt

status a la Brown University's recent report that it provided Providence with \$3.2 million in academic year 1991-92 in property and excise taxes paid by employees, taxes on its commercial property, police services and parking fines.

#### ... And Watching Them

Also figure on increased scrutiny of New England's nonprofits in the wake of scandals involving the United Way of America and Covenant House.

One sign of the times: Massachusetts Attorney General L. Scott Harshbarger has released a 10-page guide on the rights and responsibilities of trustees of the state's nonprofit institutions.

Three months earlier, Harshbarger concluded a highly publicized investigation into financial dealings between Boston University and its board of trustees.

Peter Dobkin Hall, director of the Project on Changing Dimensions of Trusteeship at Yale University's Program on Non-Profit Organizations, says public authorities are "on the verge of a big change" in the way they police the non-profit community.

#### **Giving Less**

Harvard University led all U.S. colleges and universities in 1992 gifts from all sources with a total of \$206.2 million, according to a new report by the Council for Aid to Education. Yale University and the Massachusetts Institute of Technology also ranked in the top 20.

In alumni support, Harvard, Yale, MIT and Wellesley and Smith colleges ranked among the top 20.

Yale reported a 9 percent increase in total gifts over 1991, while Harvard posted a 5.4 percent gain. MIT reported a drop of almost 14 percent. Glenn Strehle, vice president of resource development for MIT, says the institution's 1992 performance was dragged down by a significant drop in equipment gifts. Donations of cash, securities and real estate to MIT declined only 3 percent in 1992 — a normal fluctuation, he says.

The council's annual survey of voluntary support of higher education revealed that 1992 total contributions did not keep

up with increases in institutional costs. The total value of private contributions to U.S. campuses inched up just 1.6 percent in 1992 to \$10.7 billion. Meanwhile, higher education costs climbed 3 percent.

Among New England campuses reporting impressive gains in total gifts: Wentworth Institute of Technology recorded a jump of 261 percent; Lasell College, 231 percent; Husson College, 191 percent; Central Maine Technical College, 157 percent; Saint Joseph College, 143 percent; and Babson College, 115 percent.

#### Hail to the Chiefs

New England higher education continues to change at the top. In the highest profile case, Yale University appointed Arts and Sciences Dean Richard C. Levin, a longtime teacher of economics at Yale and an alumnus, to succeed Benno C. Schmidt Jr., who resigned last year to become president of the Edison Project, a plan to build a chain of profit-making elementary schools. Schmidt's six-year tenure, the shortest in Yale history, was marked by unprecedented fundraising successes, but also bitter feuds with faculty and students irritated by budget cutting measures. Schmidt also irked Yale students and faculty by commuting from Manhattan. Levin lives in New Haven.

Levin will find plenty of company when he takes the helm this fall. David K. Scott, a nuclear physicist and former provost of Michigan State University, was appointed chancellor of the University of Massachusetts at Amherst. And Peter H. Cressy, president of the Massachusetts Maritime Academy and a former rear admiral in the U.S. Navy, was named chancellor of UMass-Dartmouth.

The entire public higher education system in Massachusetts also has a new leader. In June, Stanley Z. Koplik, executive director of the Kansas Board of Regents, was named chancellor of higher education.

Among other recent presidential appointments: David M. Gordis was tapped to lead Hebrew College; Booker T. DeVaughn joins Three Rivers Community-Technical College; Steven K. Katona takes the reins of College of the Atlantic; and Donald Wharton goes to Plymouth State College.

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8.9% *SET* RATE 5.96%\* **VARIABLE** RATE

\*As of July 1, 1993

#### D A T A C O N N E C T I O N

- Women as a percentage of all recipients of bachelor's degrees in engineering during academic year 1991-92: 19
- Women as a percentage of African-American recipients of bachelor's degrees in engineering: 49
- Percentage of news reports carried by Boston television stations that are presented by male reporters: 66
- Percentage of semifinalists for 1993 National Merit Scholarships who are male: **61**
- Manufacturing jobs as a share of all New England jobs in 1970: 27
- In 1990: 16
- Change in number of service jobs in Maine, 1980 to 1989: +36%
- Change in number of manufacturing jobs in Maine during that period: -9%
- Cumulative decline in Connecticut's gross state product since 1989: 5.6%
- Unemployment rate in Bridgeport, Conn., February 1993: 11.3%
- In Bridgewater, Conn.: 2.6%
- Of New England's 200 largest employers, percentage that are located in the region's 10 largest cities and towns: 54
- Number of New England's 67 counties with a greater percentage of racial minorities than the national average: 1
- Number of New England companies among Business Week's best 100 small companies nationwide based on sales and earnings growth and return on invested capital: 13
- Percentage of typical higher education costs, including tuition, fees, room and board covered by the maximum Pell Grant in academic year 1992-93: 35
- Percentage of costs covered by maximum grant in academic year 1979-80: 77
- Percentage of full-time doctoral students who used loans toward their education in 1989-90: 16
- Percentage of full-time students seeking first-professional degrees who did: 63
- Average amount of loan for full-time doctoral students: \$6,363
- Average amount for full-time first-professional students: \$11,166
- Change in spending by U.S. households on reading materials between 1986 and 1991: -6%
- Change in spending on health insurance: +42%
- Percentage of U.S. health care dollars that pay for administration and overhead: 24
- Percentage of college freshmen in 1992 who reported "frequently" or "occasionally" drinking beer: 54
- Percentage in 1982: **75**
- Number of U.S. nonprofit organizations (not affiliated with a church) in 1940: **13,000**
- Number in 1965: **350,000**
- Number in 1992: 1,200,000
- Ratio of growth in number of nonprofit organizations to growth in number of for-profit corporations since 1940: 4:1
- Change in number of mainland Chinese students attending U.S. colleges and universities from 1984 to 1991: +386%
- Change in number of Iranian students at U.S. institutions from 1984 to 1991: -225%
- Change in number of Iragi students: -220%
- In number of Kuwaiti students: -135%
- Percentage of 1991 postdoctoral appointees in engineering, science and health fields at U.S. colleges and universities who were not U.S. citizens: 50
- Percentage in 1981: 33

**Sources**: 1,2 National Action Council for Minorities in Engineering; 3 Greater Boston NOW; 4 FairTest; 5,6 New England Governors' Conference; 7,8 Maine Science and Technology Commission; 9,10,11 University of Connecticut; 12 Economic Development and Industrial Corp. of Boston; 13 Bank of Boston, U.S. Bureau of the Census (Suffolk County, Mass.); 14 NEBHE analysis of *Business Week* data; 15,16 *Postsecondary Education Opportunity*, 17,18,19,20 U.S. Department of Education; 21,22 *American Demographics*; 23 Public Citizen; 24,25 Higher Education Research Institute, University of California, Los Angeles; 26,27,28,29 Yale University Program on Non-Profit Organizations; 30,31,32,33,34,35 National Science Foundation

#### Embedded Knowledge ... Embedded Skills

JOHN C. HOY

n the depths of an earlier recession, a Pulitzer Prize-winning historian at one New England university summed up the state of the region this way: "The problem is, we are far better than our reputation but not really as good as we think we are."

But in the "miracle" decade of the 1980s, New England really did perform better than perhaps even its most severe critics believed possible. One remarkable accomplishment to come out of that decade was New England's emergence as the region with the highest proportion of college and university graduates in the United States. In 1980, 19 percent of New Englanders age 25 and older held at least a bachelor's degree; by 1990, the proportion had risen to 25 percent. That represents an increase of 30 percent in the share of New Englanders with bachelor's degrees in just one decade.

Meanwhile, New England colleges and universities awarded 22 percent more master's degrees in 1990 than in 1980, 15 percent more doctorates and 14 percent more bachelor's degrees.

Such impressive gains were not seen at the community college level. In fact, New England institutions awarded slightly fewer associate degrees in 1990 than a decade earlier. Still, 7 percent of New England's adults hold associate degrees and 16 percent have completed some college coursework. Only California, with its extensive community college system, claims a higher percentage of adults with associate degrees.

Predicting the future productivity of higher education is a perilous task given the impact of changing economic conditions, human aspirations, rising costs, demographic change and most importantly, the continuing advancement of knowledge. The numbers reveal that the dire warnings of enrollment declines

issued during the 1980s were simply wrong. The strong performance throughout that decade should build confidence that New England will maintain — probably expand — the proportion of its labor force possessing postsecondary training and advanced education.

In the 1960s and '70s, vast numbers of baby boomers pumped up enrollments around New England. Then the baby bust generation caught up to higher education. Since 1979, the traditional college-age population has been declining steadily. But when the 15-year dry spell is over (the decline is expected to stop in 1994), sur-

veyors of the New England higher education landscape will find that the region's colleges and universities were more resourceful than earlier predicted. New England's higher education institutions successfully reached out to admit women, part-time students and, to some degree, minority students. Moreover, New Englanders revealed their tenden-

cy to place more value on lifelong education and training than their counterparts in other regions of the United States.

Yet, it would be premature for the region's higher education enterprise to rest on its laurels. New England will not experience a dramatic increase in collegeage students anytime soon. In fact, the region will not regain the number of high school graduates it produced in 1986 — a relatively low level — until 2006.

The New England dilemma may still become one of higher education *overca-pacity* given the prospect of slow population growth and more turbulent economic times.

By contrast, California projects an additional 450,000 college-age students by the year 2006. California's potential higher education population will continue to grow beyond what the current higher education system can now support. A report from the recently established California Higher Education Policy Center Study states: "Over the next 15 years, California's colleges and universities will continue to face profound revenue shortfalls that the state will not be able to overcome

through financial means alone. Either the state of California and its colleges and universities must begin planning and developing a broad range of strategies to increase productivity and effectiveness, or the next generations of California's citizens will face significantly reduced educational opportunities."

This bicoastal dichotomy — one reflection of the continuing regionalization of U.S. demographic trends — will be a powerful factor in establishing education and economic policies.

In recession-strapped New England, a key question troubling economists, edu-

The 1980s saw

**New England** 

produce the

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educated

workforce in the

nation and,

arguably, in the

world.

cators and policymakers is this: Education, training and retraining for what? The region remains confounded by the question of where the jobs are — or better yet, where they will be after defense conversion and the restructuring of the manufacturing, service and construction sectors. In fact, the job-creation dilemma here has been an urgent issue ever

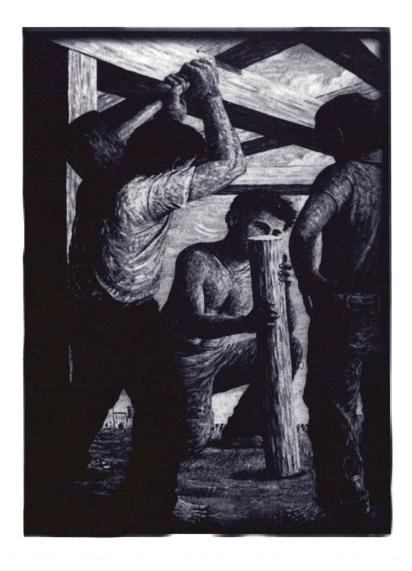
since the "peace dividend" was prematurely proclaimed in the nation's most defense-dependent region a few years ago.

We should remember, however, that the embedded skills of New England's defense workers and the embedded knowledge of the region's research-based defense enterprises are — or more correctly were — a cherished national resource.

What to do about redundant industrial, technical and scientific skills in general is not yet clear, and remains a major economic and social issue in each state. What we do know is that the 1980s saw New England produce the most highly educated workforce in the nation and, arguably, in the world. These workers and our recent college graduates remain the region's most promising resource because, in the final analysis, more education, greater skills and deeper knowledge will be the key ingredients of a full economic recovery. Our challenge today is to pry loose those embedded treasures from a still-moribund regional economy.

John C. Hoy is the president of NEBHE and the publisher of CONNECTION.

## WORK AND THE WORKFORCE



ew England is embarking upon the regional equivalent of a career change. Building missile guidance systems, fighter jet engines and nuclear submarines will now be little more than a night job. Without the Cold War, there just isn't enough work to keep places like Groton, Conn., and Bath, Maine, humming at 1980s arms race levels. Manufacturing computers and marketing advanced financial services won't pay the bills anymore, either. Both industries have been battered by domestic and international competition.

And so, as a new century approaches, New England is redefining itself as a center of ... of ... uh, err ... Well, that's the problem. We don't know what. Biotechnology? Environmental technology? Computer software? How about telecommunications? Keep guessing. These industries and others are promising. But experts doubt any

single one of them will put dinner on New England's table.

As the region contemplates its future, economists and other commentators offer some career counseling:

First of all, that prestigious New England college that graces the regional resume no longer guarantees success. One reason is New England's foreign competitors now offer not just cheaper labor, but well-educated workers. As a recent issue of Fortune magazine notes, "Don't scoff just because you never heard of the University of Limerick or the Indian Institute of Science in Bangalore. Corporate recruiters have, and they are often impressed."

In addition, the regional resume will have to put more emphasis on community and technical colleges. World-class research universities may have created the biotechnology industry, for example. But strong one- and two-year technical programs are needed to attract biotech's manufacturing jobs. What's more, whichever career(s) New England chooses to pursue are likely to be characterized by "highperformance" work organizations, where frontline workers make judgments, recommendations and decisions, rather than performing tasks by rote and leaving the thinking to a handful of engineers and supervisors. Community and technical colleges — with their ability to develop customized training programs quickly — will help make high performance possible.

New England's collective resume will also have to demonstrate that students who choose not to go to college have the chance to master skills through apprenticeships and other "school-to-work transition" programs. The region will have to take pains to ensure that these initiatives do not simply provide employers with cheap temporary labor nor "track" students from disadvantaged backgrounds into blue-collar jobs. The goal will be to give frontline workers the cutting-edge technical skills they need to make the high-performance work organizations purr, combined with the academic grounding to make future career shifts with relative ease.

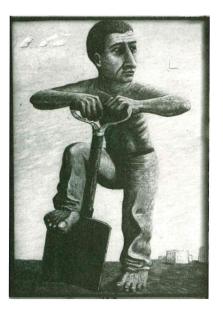
ltimately, the success of New England's career move will hinge not only on workers' skills, but also on employers' attitudes toward work and the workforce. In this too, there is plenty of room for improvement. For example, only 40 percent of New England employees believe their companies' policies help them balance work and family responsibilities, according to a 1991 survey of employee attitudes by the Wyatt Co., the international human resources consulting firm. Yet the National Federation of Independent Businesses and other organizations representing small businesses have consistently opposed family-friendly policies, such as the Family and Medical Leave Act, which requires employers with 50 or more workers to provide unpaid leave for certain conditions.

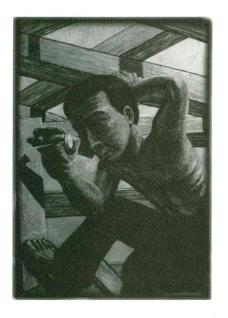
And in a remarkable display of cynicism toward business-government partnership, more than half of small-business owners oppose the idea of the federal government establishing a national apprenticeship system for young people not bound for college, according to a poll conducted early this year by Nation's Business, the U.S. Chamber of Commerce publication. Forty-six percent oppose establishment of a national program to help high school dropouts acquire marketable skills!

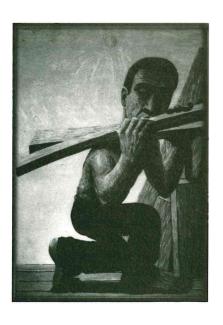
New England businesses will have to do better than the nation at training people who are already on the job. Ninety percent of the \$30 billion that U.S. companies spend each year on training is directed at just 0.5 percent of workers, mostly executives and managers, according to the American Society for Training and Development.

Above all, the region — like an individual contemplating a big career move will have to take a careful look at where it's been and where it wants to go. We trust that CONNECTION's essays on "Work and the Workforce" will contribute to that examination.

— John O. Harney









#### A Decade of Change in **New England's Labor Market**

Paul E. Harrington and Andrew M. Sum

n the early 1980s, a chorus of concerns rose over the long-term financial viability of key segments of the nation's and New England's higher education system. Some university planning experts predicted that as the baby bust generation reached traditional college age, enrollment declines and other factors would put up to one-third of New England private colleges and universities at risk of bankruptcy. Yet, by the end of the '80s, college enrollments were at an all-time high — both in the nation and in New England — despite the fact that inflation-adjusted tuition

During the 1980s,

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recessionary

1990-91 period, the

ratio was 6-to-1.

and fees among private colleges increased by nearly 50 percent during the decade. Contrary to the predictions of education planners, the demand for postsecondary education substantially increased in both the nation and in New England during this period. What happened?

Simply put, the perceived economic and social benefits of a college degree became more attractive to both young high school graduates and adults. During the 1980s, New England generated a substantial number of new wage

and salary jobs, slightly outpacing national employment growth. The occupational mix of these new employment opportunities changed significantly from 1979 to 1989, with opportunities expanding most rapidly for workers in professional, managerial and high-level sales occupations. Thus, four-year college graduates found themselves in an increasingly favorable labor market position.

The substantial increase in demand for college graduates occurred for two major reasons. First, professional services industries — including education, health care, law and engineering — which were already leading employers of college graduates, expanded their payrolls at an above average rate. Jobs in this sector grew 90 percent faster than overall employment in New England and accounted for 43 percent of the net employment gains that occurred in the region during the decade. By 1990, half of all workers employed in

professional services industries in New England had completed four or more years of college. Thus, the "traditional" college labor market in New England grew far more rapidly than the labor market as a whole.

land economy increased the proportion of college graduates on their payrolls. Changing production technologies led to occupational staffing pattern shifts favoring professionals, managers and high-level sales workers, so college graduates were employed more intensively even in industries that traditionally did not hire many college graduates. For example, in 1980, about 12 percent of those employed in nondurable goods manufacturing had college degrees. By 1990, this proportion had jumped to 21 percent. Sim-

> ilar increases occurred in the region's durable goods manufacturing, wholesale and retail trade and finance sectors.

> he expansion of the traditional college labor market in New England, combined with more intensive employment of college graduates in industries that had not traditionally required college degrees, led to a 60 percent rise in the employment of college graduates during the decade. This heightened the attractiveness of a college education for both new high school graduates and adults lacking postsecondary education. College enrollment rates among both groups increased considerably. In the fall of 1980, about 49 percent of the nation's new high school graduates had enrolled in a postsecondary education program. By fall 1992, this proportion reached 63 percent. Enrollment of adults age 35 or older also rose sharply. Nationally, this group

increased its postsecondary enrollment by nearly 40 percent between 1983 and 1988.

Unfortunately, since early 1989, New England has experienced a dramatic reversal of its economic fortunes. Following the sharply rising employment levels, declining in undergraduate enrollments during the same period. Nearly 9 of 10 new graduate students who enrolled between 1988 and 1992 attended school full-time. This suggests that a rising share of young graduates have opted to stay in school to enhance their career transition, while the recession has

lowered the opportunity costs of delaying entry into the job market.

unemployment and underemployment rates, and rising real per-capita and family incomes that characterized the 1980s, New England entered a period of steep economic decline unlike any since the 1930s. Between February 1989 and March 1993, the region lost about 670,000 jobs or more than 10 percent of its peak employment level. This substantial job loss was heavily concentration.

ed in the construction, manufacturing, and wholesale and retail trade sectors, which accounted for about 9 of 10 net jobs lost in the region during 1989-1993.

The steep declines in construction, manufacturing and trade jobs imposed a disproportionate burden on high school graduates and blue-collar workers, who were employed at above average rates in these sectors. The services industries — dominated by college graduates — were more heavily insulated from the job losses experienced in other sectors of the New England economy. In fact, between 1988 and 1992, employment among professional, technical and managerial workers in New England actually increased slightly.

Despite substantial decreases in real family incomes in New England over the past three years, college enrollments have held fairly steady. Between 1988 and 1992, undergraduate enrollment in Massachusetts, for example, declined by only 3 percent.

The recession's primary impact on New England higher education has not been declining enrollments, but worsening job prospects for new degree recipients. During the 1980s, U.S. colleges awarded approximately 1.2 associate, bachelor's and master's degrees for every net new college labor market job generated by the economy. This close match resulted in good employment prospects for most college graduates during the 1980s boom period and raised the relative earnings of college graduates considerably. However, during the recessionary 1990-91 period, the ratio of degrees to new college labor market jobs was 6-to-1.

The adverse shift in college labor market conditions has altered the behavior of a growing number of new college graduates. As immediate access to careers has diminished for some new graduates, a growing number appear to have simply opted to stay in school. Between 1988 and 1992, graduate enrollments in Massachusetts increased by more than one-third — a fairly spectacular increase that offset the modest declines observed

A New Englander with an associate degree can expect to earn 25 percent more than a counterpart with a high school diploma only. A bachelor's degree recipient can expect to earn 60 percent more than a high school graduate.

he New England labor market of the future will continue to provide substantial economic rewards to those who acquire a solid set of basic academic proficiencies while in high school and then complete four years of postsecondary education. This is likely to occur for the following reasons:

First, state and national employment projections consistently indicate that future job growth will be concentrated in the services industries, and the overwhelming majority of the new, better paying, full-time, year-round jobs in this sector will require some postsecondary education and frequently a four-year

or advanced degree.

Second, solid academic skills will have an important influence on who gets access to this set of jobs. Those with more proficient basic academic skills are most likely to enroll in and complete postsecondary educational programs. Thus, access to college labor market jobs is critically influenced by an individual's academic skills, and his academic performance in college.

Third, a growing share of future employees' occupational proficiencies will be developed at least partly in the classroom. Unlike many production oriented blue-collar and lower level whitecollar jobs, where a high fraction of occupational skills are learned on the job, an above average fraction of the occupational skills employed by higher-level workers in service industries are learned in the classroom. (Increasingly, even the "on-the-job" components of the professional development of these workers are delivered by institutions of higher learning in the form of programs that formally mix work and schooling.) U.S. employers also have been investing in their professional and management workers to a considerably higher degree than they have invested in frontline workers.

Those who fail to acquire a strong set of basic skills and complete fewer years of schooling will likely find themselves with diminished employment prospects and much reduced access to



#### **She PAs**

Are women achieving parity in the accounting profession? Yes and no, according to an ongoing study by **Bentley College Graduate** School Dean Patricia Flynn. Women made up 49.6 percent of the accounting workforce in 1988, up from 16.4 percent in 1960. And college enrollment data suggest that women are now in the majority. In 1987-88, they received 52 percent of U.S. accounting degrees, compared with 28 percent a decade earlier.

The rub: Women hold less than 5 percent of accounting firm partnerships. Some lag is expected between equal representation in the field and equal representation at its pinnacle, as generally **younger female accountants** log experience. But Flynn says there's more to it. Like their counterparts in law firms, accounting partners are supposed to bring in new business. Many of the women stuck below accounting's glass ceiling say those deals are still made in a men's club atmosphere. Flynn also suspects that women are leaving accounting for fields that offer better pay and more family-sensitive personnel policies.



#### **Health Jobs**

The health services industry, which employs more than 8 million people across the **United States, added** 350,000 jobs between 1990 and 1991, while the total **U.S. nonfarm economy lost** 1.5 million. And more growth is expected as an aging population requires more health services and medical technologies grow in sophistication. The U.S. Bureau of **Labor Statistics' ranking of** the 30 fastest-growing occupations between 1990 and 2005 includes about a dozen health-related positions ranging from nuclear medicine technologists to medical records technicians.

The strong prognosis for health jobs has sparked the interest of students. Fifteen percent of 1992 college freshmen said they wanted to pursue a career in the health professions, compared with 7.2 percent in 1987, according to a survey by the Higher **Education Research Institute** at the University of California at Los Angeles. And as of late June, U.S. medical schools had received applications from 42,418 students seeking fall admission — up 58 percent since 1989, according to the Association of **American Medical Colleges.** 

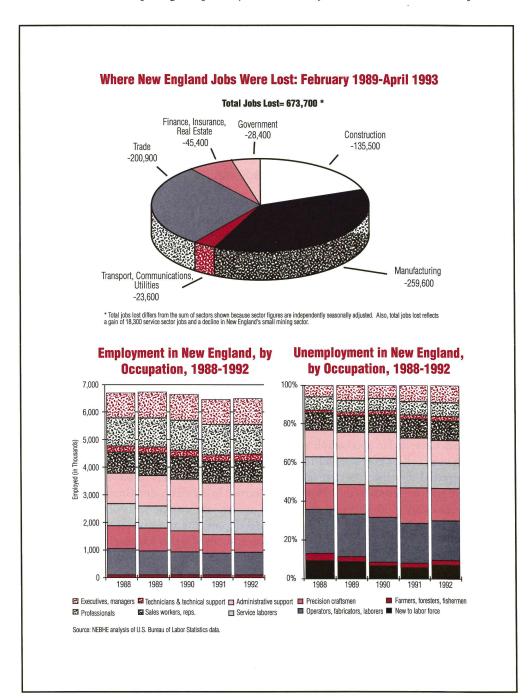
careers providing an adequate standard of living.

As the changing occupational job content of the New England economy continues to favor workers who have completed some postsecondary education, the economic rewards for earning an associate or bachelor's degree should remain strong. The 1990 U.S. Census reveals substantial earnings premiums for New England workers who hold these degrees. A New Englander with an associate degree can expect to earn 25 percent more than a counterpart with a high school diploma only. A bachelor's degree recipient can expect to earn 60 percent more than a high school graduate.

Meanwhile, Tech-Prep initiatives using applied academic curricula are opening new pathways to

college degrees for nontraditional college students. By 1992, about 25 percent of all vocational/technical graduates were enrolled full-time in postsecondary programs. Additionally, registered apprenticeship programs have proven extraordinarily effective in bolstering the earnings of young adults. As the New England states look to new strategies to enhance the career prospects of young high school graduates, Tech-Prep and registered apprentice programs offer viable models for mixing work and school at the postsecondary level.

Paul E. Harrington is the associate director of the Center for Labor Market Studies at Northeastern University. Andrew M. Sum is the director of the center.





## Higher Education and the Workforce: What is the Link in the *New* New Economy?

Ralph Whitehead Jr.

arly 1981: As the Massachusetts Legislature begins to deal with the fiscal consequences of Proposition 2 and 1/2, which severely limits local property taxes, the University of Massachusetts is told to brace for a 15 percent cut in its state funds. Six months later, its state funds rise by 13 percent. Many forces have combined to turn the threatened cut into an increase, but the most persuasive is the case UMass makes for itself. The first sentence of the university's case statement reads: "As it transforms our state, the rise of the knowledge economy casts a

powerful new light that reveals UMass as one of the prime strategic assets for the people of Massachusetts."

Early 1993: Just before President Clinton's inauguration, three dozen Democratic members of the U.S. House of Representatives go on a retreat, where guest speakers on a panel on the economy say the new administration will treat education and training — notably, higher education — as the engine of the nation's economy. The speakers offer this as good news. But one House member with close

ties to a world-class research university isn't as gratified as they figured he'd be.

"I've been touting higher education myself for quite a while now," the member says. "And let me tell ya: My constituents don't buy it anymore. They see their own kids: They finish college in debt, can't get good jobs, move back home and wind up working 18 hours a week at McDonald's. Ten years ago, my people started to say, 'A union card won't protect the blue-collar worker anymore.' Now they add to it: 'And a college degree won't protect the white-collar worker, either." There's silence for a moment among the lawmakers, as if to mark the heretical nature of what their colleague has just said. Then heads nod and the voices of eight or nine other members rise in agreement.

These are just anecdotes, of course, but they capture a crucial shift in the

public discussion of the relationship between higher education and the workforce. In the early 1980s, opinion leaders and ordinary people alike were willing to embrace the four-year college degree as the definitive credential for workers in the new economy. Now, the embrace is giving way to skepticism. For higher education, the first

step in dealing with this skepticism is to begin to understand why the shift has occurred.

A dozen years ago, the public discussion was colored by a new view of economic reality. In essence, this view said: There's a new economy. It's a knowledge-based economy. It's prime resource is knowledge. Its prime form of work is knowledge work. And its prime workers are knowledge workers.

More and more people accepted this view for two chief

reasons. One, it explained a troubling condition — the decline in the bluecollar share of the nation's workforce. Traditional blue-collar jobs, held by workers with high school diplomas or less, were vanishing, because the old economy they were part of was receding. Two, it offered hope. Though the old economy was receding, the new economy was advancing. As it advanced, it would create more knowledge work — presumably, jobs for managers and professionals with four-year degrees or better. If enough people moved out of the blue-collar orbit and into knowledge work, the decline of blue-collar work wouldn't be a problem.

As the means for people to move from blue-collar to knowledge work, higher education suddenly stood at the strategic center of the new econ-

omy. It was the leading creator of what would be the prime economic resource, a leading designer of the prime form of work and the leading supplier of the prime workers. Thus, supporting higher education looked like one of the best ways to improve society's ability to make a successful adjustment to the new economy. As that

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## Greener Pastures?

A total of 254,000 people moved to New England during the heady years between 1982 and 1989, accounting for one-third of the region's population growth, according to a recent report by the Bank of Boston. But when the boom turned to bust, migration shifted. Between 1989 and 1992, net migration from the region amounted to 199,000 people, which was only barely surpassed by the region's natural growth of 205,000 - the number of births minus the number of deaths.

Meanwhile, 61 percent of Allied Van Lines' interstate moves involving Connecticut in 1992 were out of the state, while only 39 percent were into the state, according to the University of Connecticut.

view gained acceptance, public support for higher education expanded.

The reigning assumption of the early 1980s was that as the new economy advanced, the number of jobs in management and the professions would grow; the challenge was to produce enough four-year college graduates to fill them.

This assumption has since become shaky for several reasons. For one, it's now clear that it's hard to increase the number of four-year college

graduates. In the '80s, after rising for decades, the percentage of people in their late 20s with four years of higher education leveled off. This flattening has many causes, including the steep rise in college costs, the drop in starting salaries for college graduates, the uneven quality of undergraduate teaching, the shortage of remediation at the college level, the changing demography of Americans in their teens and 20s, cutbacks in financial aid and the stagnation in the test scores of K-12 students. Many of these issues will have to be addressed before we achieve even a modest increase in the percentage of college graduates.

Also, it's now clear that a modest increase in college graduation rates—even if it's achieved—won't help the bulk of the workforce. Less than a quarter of today's workers have finished four years of college. Even if this figure were pushed up to a third, two-thirds of the workforce would still lack credentials for many of the jobs in management and the professions.

Together, these phenomena raise a new question about calls for increased investment in higher education: What share of our scarce resources should be used to achieve a modest increase in the percentage of college graduates? What share should be directed toward vocational

education, apprenticeships and other programs to aid the remaining two-thirds of the nation's workforce?

So it's no longer clear that the challenge is to create more college graduates.

And it's no longer clear that the absolute number of U.S. managerial and professional jobs will grow. Corporate downsizings have already destroyed many such jobs. Furthermore, managers and professionals are now vulnerable to offshore competition. A decade or so ago, \$2-anhour workers in South Korea became competitive with \$15-an-hour blue-collar workers in Bridge-

port, Conn., but managers in the United States didn't face such global labor market pressures. Now, the \$3,000-a-year computer hardware engineer in China's Pearl River Valley is breathing down the neck of the \$45,000-a-year hardware engineer on Route 128.

For higher education, consequently, the workforce mission of the 1990s must be not only to increase the percentage of graduates, but to help create jobs for those graduates.

In pursuing this mission, higher education won't be alone. As a nation, we've come to a maddening turn in our economic road. In the public mind, the urgent question is: How do we create large numbers of good jobs in the private sector? At the moment, the answer is: We don't know.

We can create good jobs in the public sector, but there's no electoral demand for large numbers of them. We can create lots of jobs in the private sector, but too many of them are lousy jobs. There's no shame in our ignorance. No advanced nation knows how to create large numbers of good jobs in the private sector.

There isn't an *a priori* answer to the job-creation riddle. But an answer will emerge during the next few years through a body of widely scattered experiences ranging from trials and errors conducted on a shoestring by the Thai-born entrepreneurs in the Merrimack Valley to major experiments supported by large public grants. Eventually, the viable job creation paths will emerge.

It is in the interest of higher education in New England to contribute to this experience. Institutions that already have the capacity to create good private-sector jobs should consider ways to expand it. Institutions that don't have the

capacity, but are willing and able to develop it, should do so. Both sets of institutions should take pains to tell the public what they're doing. Increasingly, higher education's claim on public resources will rest on its ability to create a greater share of the jobs that its graduates seek.

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A decade or so

Ralph Whitehead Jr., a journalism professor at the University of Massachusetts at Amherst, has reported on the changing shape of the American workforce for Psychology Today, The Utne Reader, the Boston Globe and other publications. In the early 1980s, he served on the staff of UMass President David C. Knapp.



#### To Get a Good Job ...

Frederick S. Breimyer

o get a good job ... get a good education. Generations of Americans have heeded that advice. For many of them, a good education has provided the way out as well as the way up. Of course, there have also been other and perhaps better reasons to seek a good education. An educated individual, it might be argued, leads a fuller life. Indeed, the search for a good education might be likened to a quest. If God has given man consciousness, education can exploit and develop that consciousness to desirable ends.

Most people, though, have paid more attention to education's role in promoting upward social and economic mobility. If we possessed innate ability and sufficient determination — and if we were blessed with opportunity — the acquisition of a good education would virtually guarantee a good job. Benefits thus accrued to generations of individuals and, through them, to the wider society.

The current generation of workers and students, however, is finding that the link between a good education

and getting and keeping a good job is less certain than in the past. A college education has become a virtual necessity for obtaining a good job, but no longer guarantees one. Our age is marked by job *insecurity*, stemming not so much from deficiencies of workers as from the changing requirements of the workplace. Workers in New England have hardly been exempt from such pressures, as ongoing displacements in the premier industries of computer manufacturing and defense attest.

Education is both a cause of and cure for that insecurity. It is a cause particularly when it promotes the creation and spread of new technologies. By embodying intellectual capital in computers and communication networks, advances in information technologies, for example, have displaced professional and managerial workers, much as earlier machines displaced blue-collar workers.

But education can cure as well. Displaced individuals can be — and are being — retrained and redeployed. Such efforts, though, are not often coordinated closely with the needs of expanding firms and, in any case, have been available to a relatively small proportion of displaced workers. Retraining programs clearly are needed, but they are not always effective. Even when these programs do work, it is often the older worker who receives retraining and who once again must seek a new job as an entrant. Such per-

sonal retooling is possible, but few would seek it on its own merits, particularly since the new career may be less satisfying and less financially rewarding than the old one.

Few would argue that the technological processes that produce these changes in the workplace should be resisted. Nevertheless, by implication, the employee's long-term risk/reward trade-off has shifted. The educated worker now bears more risk, but cannot necessarily expect greater rewards. Moreover, vulnerability has increased

especially around the middle of an employee's expected working life. At that time, family obligations may still exist and financial needs for retirement may remain unmet.

Since economic consequences from unanticipated job loss are likely to endure far beyond the occasion of that loss, workers may seek compensatory safeguards from elsewhere in the economic and political system to deal with their demonstrated vulnerability. The push for health care reform is one manifestation of these pressures, as displaced employees are frequently denied access to health care previously available to them.

This attempt to modify the social contract with regard to health care may be followed by efforts to revamp pensions. Many employers arrange pension benefits on a sliding scale linked to years of service. As a result, job displacement can cause dispro-

portional loss of future retirement income. While companies often recognize this impact and attempt to respond by offering severance and early retirement packages, there is generally no guarantee or requirement that they do so. Clearly, employees would depend less on corporate goodwill if pension benefits were made fully proportional to years of service and were completely vested and portable.

These concerns are heightened further by growing demographic pressures and all too evident fiscal con-

market.



## Out of Business

Since peaking in 1987, interest in business careers among college freshmen continues to decline, according to the Higher Education Research Institute at the University of California at Los Angeles. In 1987, 25 percent of freshmen said they planned to pursue careers in business. By 1992, the figure had dropped to 14 percent. Interest in business-related majors. meanwhile, declined to 16 percent, the lowest level since 1972.

The institute found that 73 percent of 1992 freshmen counted "being very well off financially" as an important objective. Just 46 percent felt the same way about "developing a meaningful philosophy of life" — far short of the 85 percent who held that value in 1968.

straints, which will likely lead to funding problems for the Social Security system early in the next century.

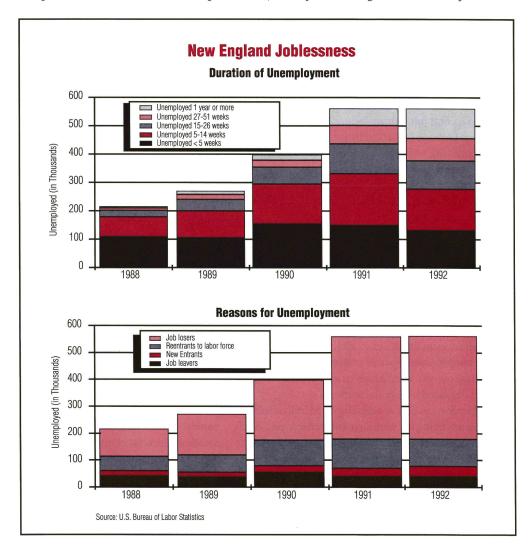
Similar pressures are developing with regard to retraining. As displaced individuals attempt to prepare for the remainder of their working lives, they often seek assistance from a broad variety of public and private sources. So far, the response has not met the need, however, and pressures for more support are likely to continue to grow. This may be particularly relevant for New England. It is not that pressures to displace workers are necessarily greater here. Rather, it is the near absence of large and growing industries to offset these pressures that makes the structural adjustments by workers more difficult to bear.

Generally speaking, the support that workers receive as they attempt difficult personal transitions may affect society's attitude toward technological progress and the search for efficiencies. From the standpoint of the economy, it is important that these processes continue, despite the pressures they exert. Long ago, economist Joseph Schumpeter noted that the creative destruction of capitalism is far more a cause for hope than its

negative aspects are a cause for hopelessness. Yet, to succeed overall, the economic system must be sufficiently flexible — and the political system sufficiently supportive — to allow those disenfranchised by the growth process to re-enter the job market.

The point is both moral and economic. It is moral in that it recognizes a social responsibility to assist individuals deprived by changes in the marketplace. It is economic in that it recognizes the ongoing value of such workers when bolstered with appropriate education and retraining. That — and that alone — may span the chasm between expendability and employability for today's generation of workers and allow workers to function productively even without the traditional safeguards that had been provided by employers. In this more fluid context, the search for a good job and a good education will be inherently intertwined, but the relationship between the two will be increasingly dynamic with no set ending.

Frederick S. Breimyer is vice president and chief economist at State Street Bank and Trust Co. and president of the New England Economic Project.





## Forging an Economic Development Partnership in New Hampshire

Ross Gittell, Allen Kaufman, Michael Merenda, William Naumes and Craig Wood

rior to the latest recession, New Hampshire's economy experienced impressive growth, significantly outperforming the U.S. and New England economies. Between 1967 and 1987, the two primary sectors in the state's economy — manufacturing and services — both posted gains in employment, productivity and wages substantially above the national average. By most measures of economic strength, New Hampshire outpaced its New England neighbors during the 1980s boom years.

The most significant growth in New Hampshire occurred during the first half of the 1980s when total nonagricultural employment jumped by more than 24 percent, durable goods manufacturing employment increased by more than 9 percent, and employment in electrical machinery manufacturing increased by 23 percent. This vibrant workplace easily absorbed the state's expanding population, which grew by 18 percent during the decade (placing New Hampshire among the top 10 states in population growth). Unemployment, meanwhile, remained below the regional and national averages.

But as the 1980s closed, the period of growth came to an abrupt end. New Hampshire's unemployment rate rose above the national average. The state had lost nearly 17 percent of its manufacturing jobs between 1986 and 1991 — an experience repeated all over New England. Over the same period, Rhode Island lost 23 percent of its manufacturing jobs, Massachusetts lost 21 percent, Vermont shed 11 percent and Maine, 7 percent.

New Hampshire — like the other New England states — is at a crossroads. The 1991 closing of one major military installation, Pease Air Force Base, the threatened closure and inevitable "build-down" at Portsmouth Naval Shipyard, and the decline in Defense Department orders for prime and subcontractors in New Hampshire makes the state vulnerable to further decline. New Hampshire's position as a low-cost, alternative manufacturing site — particularly for companies based in Massachusetts and Connecticut — is no longer viable, for with economic growth have come increases in costs, especially real estate and labor costs.

The downturn in the state's fortunes has prompted a number of reports on New Hampshire's economy, most of which agree that private and public initiatives are needed to hasten the recovery. All agree that entrepreneurs and managers of established businesses must bring together the capital and human resources needed to create and sus-

tain ongoing enterprises. All recognize that the globalization of the economy has changed the nature of competition — that companies must now compete not only on price, but also on quality and the ability to continuously improve their products. To do this, managers must develop organizations that upgrade workers' skills and they must keep abreast of technological developments and promote communication between the company and its customers regarding process and product innovations.

During the 1970s and '80s, New Hampshire's cost advantages, skilled labor and quality of life attracted new businesses and encouraged existing companies to expand; significant economic initiatives by the state were not needed.

But as New Hampshire's advantages evaporated and the state suffered prolonged economic hardships, private and public leaders acknowledged that state government must play an important, albeit limited, role in economic development. The new thinking recognizes that the state government cannot be the impetus for growth; only private initiative and national and international factors outside the state's control will play that role. But the state can help preserve and upgrade New Hampshire's core economic strengths and better position the state for recovery once the national and regional economies rebound.

New Hampshire has reached a point in its economic development where it must identify these core economic strengths, the scientific, technological and organizational foundations on which they rest, and the human resources needed to ensure their proper development and deployment. Without this type of audit and analysis, state economic policymakers cannot undertake the planning necessary to preserve New Hampshire's competitive advantages and ensure its industrial competitiveness once the national and regional economic recoveries begin.

In 1991, faculty at the University of New Hampshire's Whittemore School of Business and Economics formed an interdisciplinary study group, called the New Hampshire



#### **Hard Knocks**

College students are handicapped by a stagnant economy even before they enter the job market. A record 3.3 percent of U.S. college freshmen reported their father's occupation as "unemployed" in 1992, according to the Higher **Education Research Insti**tute at the University of California at Los Angeles. **Record numbers of fresh**men also said they: selected their college because the tuition was lower than at other institutions (30 percent), had a "major concern" about their ability to finance college (17.4 percent), and decided to go to college because they "could not find a job" (8.2 percent).

Industry Group (NHIG), to examine the industries that have made important contributions to the state's welfare and to estimate their potential to do so in the future.

NHIG found that four industries — fabricated metals, industrial machinery and equipment, electrical and electronic equipment and instruments — are critical to New Hampshire's future prosperity.

These four industries account for 48 percent of the state's manufacturing employment, 56 percent of total manufacturing output and 81 percent of manufactured exports. Between 1967 and 1987, these industries combined recorded more than 100 percent growth in manufacturing employment, output and international exports.

While companies in these four industries provide distinct products, preliminary analysis suggests that they use common technologies and make use of similar equipment, materials, technical knowledge and organizational practices. Companies in these industries share manufacturing processes such as the application of lightweight fiber-enforced composites, heat resistant ceramics and optical fibers. Knowledge of electrical engineering, computer science and advanced materials is required in the electronics, semiconductor and computer industries. Indeed, firms in the leading industries find skilled labor in these areas to be one of the state's assets, according to a recent NHIG survey. NHIG case studies also suggest that the most successful companies share management techniques that link product and process design with work organization.

These shared manufacturing, technological and organizational capabilities are referred to as core competencies. Because firms in each of New Hampshire's four leading industries share an interest in keeping abreast of advances in manufacturing processes and interrelated technologies, the core competencies provide the basis for collaboration.

Large companies in the leading industries account for a disproportionate share of employment. For example, Digital Equipment Corp. and Lockheed Sanders — two of New Hampshire's largest companies — together employ about 12,500 workers, accounting for 25 percent of all employment in the leading industries.

But 89 percent of firms in the four leading industries have fewer than 100 employees; and 95 percent have fewer than 250. They typically supply parts that ultimately find their way into products manufactured by large firms operating in distinct industrial clusters — most notably information technology, aerospace, scientific and industrial instrumentation, electric distribution and motor transportation. Although NHIG data suggest that smaller companies — particularly

startups — face technical difficulties in becoming part of a vertical supplier network, they also provide the state's best hope for sustained economic growth. They are more likely than larger firms to be locally owned and managed and to have a long-term commitment to reinvest in New Hampshire.

A survey conducted by NHIG last year provides data on the various customers and markets that New Hampshire's leading industries serve. Most companies produce for large original equipment manufacturers (OEMs) in a variety of industrial clusters. But this diversification generally follows technological lines.

For example, Walker Power, a Warner-based electronic component parts supplier with sales of \$50 million and approximately 175 employees, produces custom-designed power conversion systems for large industrial customers. However, its technological and production expertise in electronic application engineering has allowed it to grow in related areas, most notably medical/scientific equipment and information technology. Walker Power has achieved economies of scope, which allows the firm to economize by sharing common technological and manufacturing know-how across product lines and to develop new products for existing customers while entering new markets.

ompanies in New Hampshire's leading industries do not compete directly with one another. Instead, they tend to operate in distinct product market niches in which competitors are geographically dispersed. The NHIG customer survey asked companies to identify their competitor's geographic location and whether geographic proximity promoted rivalry, price competition and innovation. Less than 5 percent of survey respondents identified a concentration of competitors in New Hampshire, while just over 10 percent reported their competitors were mainly spread throughout the Northeast. Sixtyfour percent of respondents said their competitors were mostly located in other areas of the United States. And 16 percent said their competitors were mostly located outside the United States. Thanks to the absence of intensive, widespread rivalry among companies in the leading industries, there exists the potential for cooperative ventures in the state.

Already, collaborative customer relationships help New Hampshire companies continuously improve their products and production processes as they respond to customer needs. Walker Power's separate marketing group, comprised of eight employees with technical backgrounds, constantly works with customers to understand their specific needs and takes the information back to the company's engineering/production group to

design and manufacture products that meet those needs. This market interaction forces the company to improve its products and production processes continuously and to develop the know-how for entering new markets.

A collaborative relationship also allows a sophisticated customer to transfer advanced technology to a trusted components supplier. After Simplex Wire and Cable Co. of Portsmouth became expert in fiber-optic and submarine cables, the telecommunications giant AT&T contracted with Simplex to produce intercontinental telephone wires. Because AT&T found Simplex's performance exceptional, it instructed Simplex in the handling of fiber-optic cables and hired the New Hampshire company to lay intercontinental fiber-optic cables.

HIG observations about core competencies and relations among New Hampshire's strongest companies suggested the need for and feasibility of a New Hampshire public/private technology partnership to ensure the state's industrial competitiveness.

In March 1993, Gov. Stephen E. Merrill created a statewide Technology Partnership which included representatives of the University of New Hampshire system, prominent business leaders and the commissioners of Postsecondary and Technical Education, the state department of Resources and Economic Development and the departments of Transportation and Environmental Services. The partnership will coordinate the state's existing networks that link business to education and state government, and private businesses to the public sector.

The partnership's industry representatives sit on the boards of the Whittemore School of Business and Economics, the New Hampshire Industrial Research Center and the New Hampshire Technology Council. And the Department of Resources and Economic Development representative works with the Small Business Development Center representative on a business visitation program, which surveys and reaches out to businesses throughout the state, and meets regularly with regional development groups in Manchester, Nashua, Sullivan County and the Seacoast.

By joining the partnership, these various interests have accepted the responsibility of establishing a coordinating group that can convert the state's existing networks and resources into a more effective technology infrastructure. The mission of the partnership is to build an institutional and administrative structure to make more efficient use of existing resources and identify the need for new resources to support the competitiveness of small-and medium-sized manufacturing firms in New Hampshire.

In May 1993, the partnership initiated two

studies to determine industry needs. The first, conducted in cooperation with the Northeast Manufacturing Technology Center, will survey companies in the leading industries. The second will involve focus groups within these industries, as well as emerging industries (such as software and environmental services) and traditionally strong industries (particularly, wood and paper products). These studies are part of a planning process that will end with the partnership's programmatic recommendations to the governor in October 1993.

As partnership activities unfold, NHIG and the faculty of the University of New Hampshire foresee a threefold mission: (1) to inform state government and other public and private economic development actors in the state about the best private industry and government development practices in and outside the state, and about national and international industrial, technological and economic changes that could significantly impact the state's economy; (2) to help identify the future direction for state economic development strategy; and (3) to monitor and evaluate the performance of state economic development initiatives. Toward these ends, the group will continue to track the state's economic performance through analysis of federal and state data, surveys, visits with private industry and partnership activities with public and private agencies throughout the state.

The activities of the Technology Partnership and the NHIG offer the promise of an informed and balanced approach to economic policymaking in New Hampshire. Recent economic initiatives in the state represent a significant change from the laissez-faire approach of the past, yet are consistent with private and public priorities. The new efforts recognize the limited public resources available, resistance to a broad-based tax and New Hampshire's long history of limited government involvement in the economy. The priority for New Hampshire, as it is for an increasing number of states in New England and across the nation, is cost-effective and focused economic development policy with the public and private sectors and state institutions of higher education working together to overcome economic barriers and leverage emerging industrial opportunities. The lessons coming from New Hampshire over the next several years — most notably the experience of the Technology Partnership and the active use of university faculty to help guide and implement state policy — could provide insight for economic development policymaking in the other New England states and nationally.

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#### MASSNET (Working)

Massachusetts' 15 community colleges have been training workers in more than 1,000 businesses in their respective regions of the state for over 20 years. Now, the colleges have formed a clearinghouse called MASSNET to provide "onestop shopping" for employers with retraining needs ranging from upgrading the skills of clerical workers to management training.

**MASSNET** provides businesses with access to consultants and industry experts as well as customized community college programs around the state - all at the toll-free touch of the telephone. Businesses pay for the service on a contract basis, so there's no extra cost to the state. In July 1993, the network was receiving about 10 new inquiries a day, mainly from smaller businesses unaware that community colleges offered such services. "There is a greater recognition of their reliance on us for retraining," says Quinsigamond Community College

**President Clifford Peterson.** 



## High-Quality Workers: Our Distinctive Natural Resource

John C. Rennie

t has been said before, but bears repeating, that if the nation had been settled from west to east, instead of east to west, New England would probably be a national park. The region has much natural beauty, but few natural resources, a difficult climate and poor land for agriculture. Perhaps that's why our forebears were so conscious of education, realizing that a well-educated populace could make up for other deficiencies and provide the region with its own distinctive "natural" resource.

As industry after industry becomes dominated by technology and information processing, it is becoming increasingly obvious that this special New England resource may be the most important one for any region to possess in coming decades. So, on the surface, New England seems well-positioned to prosper in the next century. But New England won't prosper unless we take drastic steps to ensure that the region produces the quality workforce demanded by the new economy.

Today, the skill requirements of the workplace are rising, while the competencies of job-seekers are declining. The top, say, 50 percent of graduates of decent colleges and universities are keeping pace with changing requirements for entry-level skills and knowledge. But the lower 50 percent are slowly losing ground — and they are very expensive to train. Among high school graduates, the top few percent from the best schools have adequate skills for some entry-level work, but the rest are rapidly falling behind — and all of them require on-the-job training, sometimes at a high cost. Those who have not finished high school do not have the skills required for most entry-level jobs and cannot be trained at a reasonable cost.

With its high energy and housing costs, harsh climate and image as insular and unfriendly, New England historically has not attracted working-age people from oth-

er regions. Unlike some other regions, New England is expected to have a relatively static total population over the next 20 years, with births and migration into the region staying only slightly ahead of deaths and migration out of the region. New England can make the best of this situation by creating the highest quality workforce in the

nation. This should be the priority of the region's political, business and education leaders in the 1990s.

To support a strong economy, vital political and social structures and excellent quality of life in the coming decades, New England must extract the maximum potential from every person in the region. To do so, we must first ensure that our population is afforded opportunities for modern and relevant education. Significant improve-

ment must be achieved in embracing the often-neglected segments of our population, such as minorities and immigrants, illiterate adults, and the physically and mentally impaired. They must have their skills and knowledge elevated to the demands of sophisticated job markets. Only then will we be making the best use of our distinctive resource.

To achieve these goals, the following steps should be taken regionwide — and soon:

1) All elementary and secondary schools must be dramatically improved. Systemic reform must be driven by a commitment to equitable education, so children are not penalized for living in poor communities. States have a constitutional responsibility to educate *all* children so they have an even chance at leading productive lives.

2) Increased and serious attention must be paid to the school-to-work transition not just rhetorically but in policy, programs and budgets. Such a commitment could

dramatically improve the futures of the majority of young people who do not pursue a college education. The entire construct of vocational-technical education needs to be overhauled to reflect the new workforce realities. New England must change the image of voc-tech schools, integrate the voc-tech experience with the so-called "com-

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prehensive" high schools, and foster greater cooperation and articulation between secondary schools and higher education institutions. Middlesex Community College in Massachusetts, for example, has agreements with nearby high schools enabling transfer of credits and sharing of facilities. Such programs are increasingly common — and greatly needed.

3) Teachers must be exposed to today's workplace so they can better grasp the new demands on workers and understand the relevance of schoolwork to the career pursuits of their students. This new perspective should lead to advancements in pedagogy and provide teachers with increased confidence in their societal and economic development roles.

4) Industry must increase its support of education and educators. This can be achieved on three levels: direct assistance in such activities as school-business partnerships; advocacy on behalf of education in community and business groups; and adoption of company policies to underline the importance of education. For instance, requesting grade transcripts from job applicants and allowing employees time off during working hours for parent-teacher meetings are ways to demonstrate the company's seriousness about education.

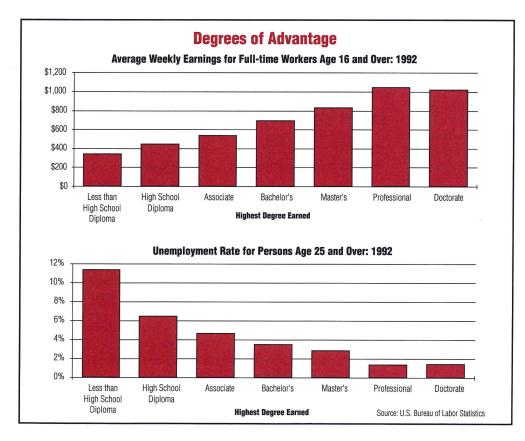
5) State governments must coordinate all efforts to address adult literacy, job training and retraining of productive workers from obsolete industries. State and federal programs must be carefully coordinated — and if necessary augmented

— to obtain the maximum positive outcome, namely, an educated and employable citizenry.

If these steps are taken, the region's colleges and universities will have an improved and enlarged applicant pool. And New England will be known throughout the country and the world as a region with a clear grasp of economic priorities and an extremely skilled and stable workforce to see those priorities through.

Some strides have been made in this direction. For example, recently passed school reform legislation in Massachusetts raises expectations of student performance and imposes sanctions against schools for persistent underperformance. The legislation also decentralizes the system, with decision-making and resource allocation pushed down to district levels, and introduces a new school finance system promising equity among school districts and stability in funding from year to year. But more is needed across the region. Though solutions will vary from state to state — indeed, from school district to school district — a regional mechanism allowing cross-pollination of innovative school programs would be valuable. If we fail, our children and grandchildren may yet see New England become a national park — curious and interesting, but totally dependent on visitors from prosperous economies for its livelihood.

John C. Rennie is the chairman and chief executive officer of Pacer Systems Inc. of Billerica, Mass., and founder of the Massachusetts Business Alliance for Education.





#### Good Vibrations

Interactive video technology provides a way for workers to learn at their workplaces. **The Hartford Graduate Center** (HGC), for example, uses such technology to bring professional training to Connecticut-based United Technologies' more than 16,000 engineers and scientists worldwide. Acoustics is a popular subject, because noise and vibration are a concern for UTC divisions that manufacture helicopters, air conditioners and elevators. More than 90 of the company's employees at various sites in the Northeast have taken acoustics courses from Pennsylvania State **University via HGC without** leaving their worksites.



## New England Is Choosing High Skills

Eleanor M. McMahon

hen the Clinton administration and Congress agree on a national school-to-work initiative, it may well bear the markings of state programs already underway in New England and other regions.

Three New England states are among the 20 leaders across the nation in implementing key recommendations of *America's Choice: high skills or low wages!*, the 1990 report of the national Commission on the Skills of the American Workforce. *America's Choice* warned

that the United States is silently ensuring low productivity and, therefore, low wages for its future workers by failing to develop school-to-work transition systems for students who do not pursue college.

The landmark report proposed several steps to develop high-performance work skills, including a requirement that high school students meet national performance standards leading to a Certificate of Initial Mastery by age 16.

Students who do not plan to attend four-year institutions would work toward a technical or professional certificate based on national competency standards for various occupations. The report identifies employers as critical partners in helping young people meet those standards through a two- to four-year program of combined work and study, beginning typically in the junior year of high school and continuing at least through completion of the secondary level, perhaps through community college as well.

Three years after the release of America's Choice, this general concept has support in the White House. Indeed, one of the key authors of the report, Rhode Island business strategist Ira Magaziner, is President Clinton's senior advisor for policy implementation.

State responses to *America's Choice* have ranged from creating study commissions to actually developing and

implementing school-to-work programs. One popular strategy, for example, has been to provide youth apprenticeships beginning in high school and including related classroom instruction and supervised work experience.

Many state programs look to Germany's public appren-

ticeship program as a model. It enrolls 70 percent of that nation's 16- to 19-year-olds. In grades 7 through 9, students receive information about a variety of occupations and then choose either a college-preparatory, academictechnical, or vocational program. Notably, there is no option similar to what we in the United States call the "general program," to which students not enrolled in either college-preparatory classes or vocational or business stud-

ies are relegated. General programs of study enroll about 40 percent of U.S. students, and remain devoid of any academic or vocational direction or any connection with the world of work. Twothirds of the Americans who drop out of high school leave general programs.

In Germany, students who go into vocational programs attend school parttime while they receive on-the-job training and stipends from employers. By age 18, more than half of those enrolled in such programs sign contracts with employers that specify the training and compensation they will receive. While in the apprenticeship programs, students take standardized interim and final examinations established by worker and employer organizations. Competency standards covering 400 occupations are established by Germany's Federal Institute for Vocational Training. Employers are assured long-term productivity of workers and given the opportunity

to observe potential workers during tryout periods. In fact, 80 percent to 90 percent of apprentices who train in large firms continue as employees in the same companies when the apprenticeship ends.

In the United States, some recent school-to-work tran-

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sition efforts are referred to as Tech-Prep 2+2. These programs integrate the last two years of high school with the first two years of college for students interested in technical fields. Many Tech-Prep programs rely on the business community's involvement in curriculum development and student assessment.

Some school-to-work demonstration projects have been funded by two-year grants from the U.S. Department of Labor. In other cases, such as in Arkansas, New York, Oregon and Wisconsin, the states are the principal supporters, though their level of funding varies substantially. President Clinton's home state of Arkansas provided the greatest amount among those four states — \$2 million over two years. Private foundations are also contributing a significant share of funding to efforts such as the Southern Regional Education Board's "High Schools That Work" project, which involves 28 pilot programs in 13 Southern states.

The Southern project has recently reported promising results. Over the past five years, the pilot schools have revised their curricula by weaving together academic study and the world of work. Approximately half the schools involved have replaced general program courses with integrated curricula in which students take applied science and applied mathematics courses rather than courses such as consumer math and introductory science. Participating students showed significant improvement on national reading, math and science tests, with the most impressive gains made by students in programs which had achieved the greatest integration of academic and vocational agendas.

Il six New England states have launched major initiatives to develop school-to-work transition programs. Approximately 40 Tech-Prep and school-to-work transition projects funded under the federal Carl B. Perkins Act are in place in the region, according to the New England Board of Higher Education. Total funding across the states amounts to approximately \$3.9 million in fiscal 1993, and subject areas range from agriculture to telecommunications.

In Rhode Island, Gov. Bruce Sundlun in 1991 assembled a Skills Commission comprised of 113 members from industry, education and the public sector to address the issues set forth in America's Choice. Magaziner was appointed co-chair and in May 1992, the Rhode Island commission issued its report, Rhode Island's Choice: High Skills or Low Wages. Consistent with the America's Choice theme, the Rhode Island report argued that America stands at a crossroads, facing a choice between low wages and low skills or high wages based on high-performance work organizations

and highly skilled workers. The Rhode Island commission recommended that students be required to earn a Certificate of Initial Mastery before graduating from high school. The commission also recommended the establishment of three- to four-year programs leading to professional certification in occupations not requiring a bachelor's degree.

The commission envisioned the professional certification programs beginning at the high school level after a student earned the Certificate of Initial Mastery. The programs would combine general education, specific occupational skills and work experience in a curriculum created by industries and educators. Students would leave the program with a valued industry certification, a strong academic foundation, work experience in a range of related jobs and, possibly, an associate degree. Employers would serve as mentors to ensure that students had acquired the skills and knowledge required by particular industries and then would reward graduates with preference in hiring and compensation.

Currently, school systems, as well as business and labor leaders across Rhode Island, are examining the commission's recommendations. The review is essentially a "bottom-up" one, in which each local education agency and community makes its own decision regarding implementation. Within one year of the report's release, 17 of the state's 37 school districts had expressed a strong interest in the proposals. Of those, seven had reached consensus among constituent groups and begun planning implementation.

Rhode Island has a head start in school-to-work programs. In 1987, a cooperative effort between the Community College of Rhode Island (CCRI), the state Office of Higher Education and the Department of Elementary and Secondary Education created and funded a Tech-Prep associate degree program. This program was part of a national effort sponsored by the American Association of Community Colleges to produce more "work-ready" workers. Currently operating in 27 of Rhode Island's 41 high schools, the Tech-Prep program provides a promising alternative for students enrolled in unfocused general education courses and a model for school-to-work transition programs.

A fundamental mission of the Tech-Prep program is to increase skills by keeping students in school. Of the high school seniors who participated in the Rhode Island program in the 1990-91 academic year, 94 percent graduated that spring. And of those who graduated, 57 percent went on to CCRI on a full-time or part-time basis. More than 1,000 students are now involved at the high school level, and more than 300 have moved up to the community college level.

## Swords to Plowshares

Per-capita defense expenditures in New England are more than double the national average. And with just 5 percent of the U.S. population, the region accounts for 9.3 percent of jobs in the private defense industry. But the bigger they are, the harder they fall. New England would lose an estimated 76,000 privatesector defense jobs over the next five years - or more than 10 percent of the national loss — under defense cuts proposed by President Clinton, according to data from the nonprofit Defense Budget Project.

The defense "drawdown" will sting defense-dependent local economies from New London, Conn., to Bath, Maine. But a report by the **Bank of Boston's Economics Department notes that spend**ing on operations and maintenance of military facilities and hardware procurement will take the deepest cuts. Therefore, according to the report, Maine, Rhode Island and Connecticut will take bigger hits, while Massachusetts may benefit from its emphasis on research.

Connecticut already has seen the value of defense contracts shrink from \$5 billion in 1991 to \$3.1 billion in 1992.



#### **Maine Skills**

**Under Maine's Youth** Apprenticeship Program, jobs specialists from the **Jobs for Maine's Graduates** program teach 9th- and 10th-graders about career opportunities. To be eligible for a youth apprenticeship, 10th grade students must demonstrate a mastery of academic skills, motivation and social maturity, in a test based on Maine's Common Core of Learning. In the 11th and 12th grades, apprentices spend 20 weeks at high school and 30 weeks working for an employer. At the end of 12th grade, the student receives a high school diploma. In the "13th grade," the student spends 16 weeks at Maine Technical College and 34 weeks working. At the end of this third year of the apprenticeship, the student receives a one-year Technical College certificate and a Certificate of Skill Mastery, which lists the skills possessed by the apprentice. If an employer determines the apprentice does not meet those standards, the apprentice can return to school at no cost. As apprentices, students receive stipends of about \$5,000 a year.

As the Rhode Island program has evolved, the role of business has become increasingly important. Local chambers of commerce have helped develop mentoring programs. And the Tech-Prep program now features many of the school-towork transition initiatives envisioned in both *America's Choice* and *Rhode Island's Choice*, such as a summer program, in which students are on jobs four days a week and in the classroom one day a week.

The leadership role of CCRI in this area was most recently recognized in the form of a \$312,657 federal grant — one of only nine such national awards — which will be used to help other states, school systems and community colleges replicate the Rhode Island Tech-Prep associate degree program.

Vermont is another pioneer in school-to-work programs. In 1988, then-Gov. Madeleine M. Kunin appointed a "Getting READY To Work" study commission to address issues of education, job preparation and economic development. One year later, that commission released a report recommending greater coordination of state education and training programs and a change in the governance of area vocational centers. The Vermont experience may also influence national policy; Kunin is now deputy secretary of education in the Clinton Administration.

Maine has also taken a leadership role in applying the basic recommendations of *America's* 

Choice, launching a statewide youth apprenticeship program in the fall of 1992. The program is expected to cover all of Maine by the end of 1995, with each local project featuring a partnership between an employer, a technical college, a secondary vocational center and a local school administrative unit. Successful applicants will be enrolled in Maine's "Jobs for America's Graduates" schoolto-work transition program. Participants will complete a qualifying performance- and portfolio-based assessment and will be awarded a Certificate of Skill Mastery and a Maine Technical College System Certificate with an option to continue on to an associate or bachelor's degree.

Many of the policy directives of *America's Choice* have been endorsed at the national level — most notably in President Clinton's proposal to launch a national youth apprenticeship program with \$270 million in funding in fiscal 1994.

The Clinton plan, along with state school-towork initiatives like those underway in New England, could turn America's silent acceptance of low skills for its youngest workers into a clarion call for a more highly skilled and efficient workforce.

Eleanor M. McMahon, a Distinguished Visiting Professor at Brown University, is the former Commissioner of Higher Education in Rhode Island and was co-chair of the Rhode Island Skills Commission's committee on school-to-work transition programs.

#### **FASTEST GROWING U.S. OCCUPATIONS, 1990-2005**

	1990	1990-2005			
Occupation	# of Jobs	% Increase	New Jobs	Reason for Growth	
Homemaker-Home Health Aides	391,000	88%	343,000	Growth of elderly population	
Paralegals	90,000	85%	77,000	More demand from lawyers	
Computer Systems Analysts	463,000	79%	366,000	Increases in computer networking	
Physical Therapists	88,000	76%	67,000	Expanding rehab and long-term care services	
Medical Assistants	165,000	74%	122,000	Growth of health services industry	
Operations Research Analysts	57,000	73%	42,000	Competitive pressures on organizations	
Human Services Workers	145,000	71%	103,000	More programs for elderly, disabled and families in crisis	
Radiologic Technologists	149,000	70%	103,000	Growth of elderly population	
Psychologists	125,000	64%	79,000	More attention to mental health	
Travel Agents	132,000	62%	82,000	Increases in vacation and business travel	
Correction Officers	230,000	61%	142,000	More prisons	
Flight Attendants	101,000	59%	59,000	Increases in number and size of planes	
EEG Technologists	6,700	57%	3,800	More diagnostic tests	
Computer Programmers	565,000	56%	317,000	More computer applications	
Surgical Technologists	38,000	55%	21,000	More surgeries	
Services Sales Representatives	588,000	55%	325,000	Increases in demand for services	
Occupational Therapists	36,000	55%	20,000	Growth of elderly population and increases in survival rates after accidents	
Medical Record Technicians	52,000	54%	28,000	More medical records for financial management and quality control	
Nuclear Medicine Technologists	10,000	53%	5,500	Growth of elderly population	
Respiratory Therapists	60,000	52%	31,000	Growth of elderly population	
Management Analysts/Consultants	151,000	52%	79,000	Competitive pressures on organizations	
Source: NEBHE analysis of U.S. Bureau of Lab	or Statistics data.				



## **Environmental Education Thrives: But How Best to Prepare Green Professionals?**

Julie Lanza

tudent demand for environmental degree programs has risen considerably over the past five years, fueled primarily by the prospect of good jobs in the environmental technology industry and a growing need for environmental knowledge in the broader job market. But more than two decades after the first environmental studies programs were introduced, there is little agreement on how to prepare a generation of workers to tackle looming ecological challenges.

Harvard University's introduction of an environmental studies major early this year might have marked a sort of coming of age for environmental programs. But Harvard — like many of the roughly 80 New England colleges and universities that preceded it in offering degrees in environmental fields — struggled to reach the appropriate balance of science and policy. From the start of the process, Harvard scholars and administrators raised concerns about the broad nature of most existing environmental studies programs. Harvard eventually settled on an interdepartmental program in environmental science and public policy, with a heavy emphasis on chemistry, biology, earth sciences and mathematics.

"It was felt that, without that amount of science, policy doesn't make any sense," explains Ulrich Petersen, the Harry C. Dudley professor of economic geology in Harvard's Department of Earth and Planetary Sciences, who will teach an introductory course in the new program. "This is the minimal amount of science we felt any environmentalist should know to make intelligent decisions."

In some programs, the balance is tipped toward the social sciences and humanities. Middlebury College's environmental studies program was constructed under the tenets of traditional liberal arts education, "emphasizing breadth of coursework and attempting to develop critical thinking," according to John Elder, the English professor who directs the program. Middlebury's goal, Elder says, is to produce environmentally literate graduates with the knowledge, skills and ethical values needed to encourage sustainable development.

Middlebury requires students to take introductory courses in the natural sciences, the social sciences and the humanities. Elder teaches an introductory course on the literary and artistic heritage of the environmental movement. "By requiring those courses at the beginning, we want to be very clear that this is not simply an environmental sciences program, it's environmental studies more

broadly construed," he says. "At the same time, we feel that any environmental program does need to have at least some significant grounding in the sciences."

James Hornig, chairman of environmental studies at Dartmouth College, says that when Dartmouth designed its interdisciplinary environmental program in 1970, the objective was to "infect" as many students on campus as possible "with some of the emerging ideas of environmental quality." In some ways, that objective has been realized: Today approximately 40 percent of Dartmouth students take at least one of the 20 environmental studies courses offered.

Still, interdisciplinary programs find little security at liberal arts colleges. Dartmouth's environmental studies staffing levels have remained constant at four full-time equivalents for years, and Horning notes that any university-wide budget tensions always threaten to pit the more "entrenched" classical departments against newer programs like his.

The students, too, have changed over the past two decades. More and more students are clamoring for recognition of environmental studies at Dartmouth as a full-fledged major. "They know they want a career in some kind of environmental activity and [they want to know] why can't their transcripts show it, and why can't they have the same kind of advanced courses that would qualify them and lead them on into those kinds of careers?" explains Hornig.

Indeed, even the least career-oriented environmental programs are beginning to address the most practical of concerns: What will their students do after graduation?

ccording to the *Environmental Business Journal*, a trade newsletter published in San Diego, the U.S. environmental industry produced \$123 billion in revenue in 1992 and employed 970,000 people. Although growth in the domestic market has recently slowed, over-



#### **Brewing Jobs**

**Biotechnology firms have** favored New England because of its concentration of world-class research universities and hospitals. But the best source of trained workers for biotech process manufacturing tends to be the pharmaceutical industry, which is virtually nonexistent in New England. The region's high cost of living makes hiring from drug companies in other parts of the country impractical. So, the biotech industry is doing what it can to prepare homegrown talent.

For example, the Massachusetts Biotechnology Council has established a scholarship program to encourage high school seniors who are interested in science to continue their studies at four-year colleges and universities. The program also identifies summer jobs at biotech firms for scholarship recipients.

In addition, the city of Cambridge, Mass., has launched a 12-month biotechnology skills training program for city residents. Forty-five Cambridge biotech companies already employ 3,500 people. The program is taught by Boston University and Just a Start, a local group specializing in job skills.

seas opportunities should increase by the end of the decade, especially for engineering and consulting firms and in the solid waste and resource recovery/recycling industries. This is not to say that the only jobs for graduates of environmental

programs are in industry: Graduates also find work in government offices, nonprofit organizations and law firms. Still, the post-graduation job search can be long and competitive.

Elder of Middlebury says that until recently, environmental studies graduates have been going the way of most Middlebury graduates — they wind up in a variety of professional pursuits from banking to medical studies that may or may not have anything to do with their degrees. Today that's changing for the environmental studies graduates. The job track more frequently leads to environmental organizations, but typically only after

some personal sacrifice, including a highly competitive search for a non-paying internship after graduation. "It's amazing how hard it is getting a job that doesn't pay you anything," says Elder.

John R. Cook Jr., president of the Boston-based Environmental Careers Organization, warns that colleges and universities should not be wooed into feeding particular segments of the environmental industry despite the demands of a competitive marketplace and edgy undergraduates. "My sense is the ramp-up time to establish an academic program is not a matter of months, it's a matter of ... three to five years. If you're targeting a particular

part of the environmental industry," he says, "when your students get to the door to go out, there may be nothing there."

Cook favors a broad-based program of studies in the environment for all students, noting that those graduates who may have the greatest impact on the natural world may not go into traditional environmental jobs. "You don't have to work for the National Park Service or a consulting firm. You could be a banker and have a major impact on the environment," says Cook. "You could encourage green lending policies."

Cook says the debate over the future form of environmental stud-

ies is a healthy one. "The tension between scientific understanding, political awareness, practical considerations such as career development, humanistic understanding and general environmental literacy will probably never be resolved, just as there's no real agreement on what a truly educated person is."

Julie Lanza is the assistant editor of CONNECTION.

#### **EMPLOYMENT IN THE ENVIRONMENTAL INDUSTRY**

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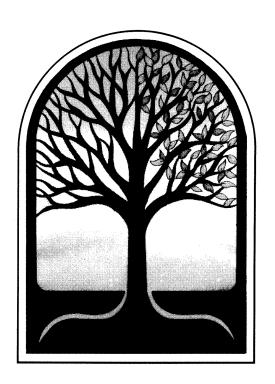
could encourage

green lending

policies."

	1	991	1991-1996	
	Revenue*	Jobs	Revenue Growth*	<b>New Jobs</b>
Solid Waste	\$27.4	228,000	\$7.9	67,000
Resource Recovery/Recycling	15.8	144,000	5.3	62,000
Water Treatment/Equipment	12.5	89,000	3.0	22,000
Hazardous Waste	13.7	119,000	4.7	41,000
Engineering/Consulting	13.4	134,000	7.2	72,000
Private Water Utilities	11.8	65,000	1.2	7,000
Pollution/Waste Mgmt Equip	11.0	78,000	4.1	29,000
Air Pollution Control	5.3	38,000	4.6	33,000
Asbestos Abatement	3.0	27,000	0.1	1,000
Analytical Services	1.7	17,000	0.6	6,000
Instruments	1.8	14,000	0.7	5,000
Alternative Energy	2.0	18,000	0.8	7,000
TOTAL	\$119.4	971,000	\$40.2	352,000

<sup>\*</sup> Revenue and revenue growth in billions. Source: Environmental Business Journal



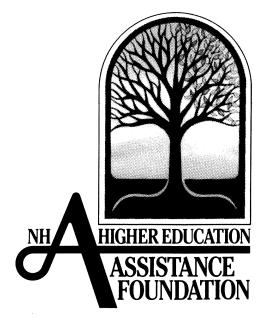
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#### Feedback:

### Research and the New England Economy

he "Cover Stories" in the Winter 1993 issue of CONNECTION warned that the balance of research power in America is shifting significantly, due to a combination of federal science policies, grassroots economic development efforts, bias against "elite" institutions and "pork-barrel" funding. The report focused primarily on the severe impact this shift has had on New England's fabled research enterprise. In 1984, New England universities accounted for \$10.10 of every \$100 spent by all U.S. universities on R&D. By 1991, the figure was \$8.70 — reflecting a drop of 14 percent. Following are a few reactions.

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understand what
is in the "black
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and development
to predict when
R&D is capable
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advantage.

## Regions Don't Live on R&D Alone

#### HARVEY BROOKS

A good deal of the recent commentary regarding New England's economic downturn deals with the region's declining share of U.S. research and development and its reduced public investment in higher education. Regional performance of R&D is taken as a surrogate for regional innovative activity, and it is assumed to be a predictor of future economic performance.

However, one has to be cautious about placing too exclusive an emphasis on this one indicator. There is a danger that the total volume of regional R&D — regardless of its content and of the state of numerous complementary factors — may become an end in itself. Much of the new knowledge created by R&D is in part a "public good." There is no assurance that *New England* businesses and residents will necessarily reap the economic benefits of *New England* R&D. In fact, as capital becomes more mobile and the rate of knowledge diffusion increases, it becomes less certain that R&D performance alone will be able to confer a competitive advantage upon New England to the degree that it appears to have done so in the past.

As technological know-how becomes more grounded in science, it diffuses faster. This has already become evident with respect to the competitive advantage of nations, and is likely to be even more true in the case of regions. The too-exclusive focus on R&D and even on the investment in advanced

human resources implies an assumption that the fundamental barriers to economic progress — the societal bottlenecks — lie in the supply of new knowledge and in the ability of New Englanders to create and master it first. This may or may not be true. Indeed, this is an assumption that is not necessarily self-evident, though it has frequently been treated so.

A famous report prepared for the U.S. Department of Commerce as long ago as 1966 by a New Englander, former Cabot Corp. Chief Executive Officer Robert Charpie, showed that R&D constituted only about 10 percent to 15 percent of the investment required to bring a new product or process to market, so if the other 85 percent to 90 percent is absent, it cannot necessarily be offset by more R&D.

It is true, however, that one of the most important functions of R&D is to reduce the risks — both technical and, to some extent, economic - associated with the "downstream" investments necessary to bring technology to market. In that sense, R&D and human resources may be prerequisite to economic success. There is also some evidence deriving from the analysis of patent statistics that geographical proximity of R&D to downstream activities provides a competitive advantage in realizing the economic benefits of such activities. This is partly because some of the knowhow moves with — and is embodied in people and organizations, rather than spreading through the more recognized forms of technical communication. Despite modern high-speed travel and communications, proximity does provide an advantage in the speed in which capabilities diffuse from a source. And as knowledge becomes more public, this speed can become a critical competitive advantage under some circumstances.

Still, one must understand in far greater detail what is in the "black box" of R&D — and even of advanced education — in order to predict when R&D is capable of conferring a regional competitive advantage. Becoming obsessed with the region's share of R&D can be a serious barrier to this deeper understanding.

Harvey Brooks is a professor of technology policy at Harvard University's John F. Kennedy School of Government and former Harvard engineering dean.

## Lowell Spins a New Success Story

#### WILLIAM T. HOGAN

The Winter 1993 CONNECTION reported that the University of Massachusetts at Lowell led New England's public universities in growth of research and development expenditures from 1986 to 1991. This leadership is partly attributable to the university's sharply focused mission and organizational structure of interdisciplinary centers and institutes.

When UMass-Lowell's predecessor, the University of Lowell, was formed in 1975, it was given the specific mission of increasing economic opportunities in the region, in addition to the fundamental mission of educating the next generation. As a new institution, the university had the rare opportunity to decide where to position itself on the spectrum of university activity.

In matters of R&D, Lowell deliberately focused on industrial product development, so as to most effectively make its individual contribution to regional economic vitality. This focus accounts for the university's steady growth in R&D expenditures. Only half of the total funds come from federal sources; most of the remainder comes from private industry. (On average, federal funds account for 68 percent of R&D expenditures at New England colleges and universities.)

The development of a supplementary organizational structure to help carry out the university's industrial development mission has also fostered the growth of R&D funds. The interdisciplinary centers and institutes that comprise this structure cut across the traditional academic disciplines in an effort to more accurately address the information needs of industry.

To cover the breadth of competitive challenges posed by the knowledge-driven, global economy, the number of these cross-disciplinary centers grew rapidly in the 1980s from three at the beginning of the decade to 19 today. The university then organized these 19 centers under a central committee in order to focus their efforts on certain industrial issues.

This arrangement is one step in a campus-wide effort to develop a sustainable regional industrial economy that is both environmentally and socially sensitive. Two interdisciplinary centers — The Center for Plastics Innovation and the Toxic Use Reduction Institute (TURI) — are illustrative of Lowell's approach to its niche mission and the corresponding impact on its R&D activity.

The U.S. plastics manufacturing industry shipped more than \$81 billion in products in 1989 — almost double that of the steel industry and other metal industries. In the late 1980s, Massachusetts ranked 9th in the nation in plastics manufacturing, hosting 959 fabrication establishments, which employed nearly 56,000 people. Massachusetts' plastic industry affects many of the state's other key economic segments, such as the computer, electronics, medical devices, aerospace, toys and packaging industries.

The Institute for Plastics Innovation aims to improve the competitiveness of the plastics industry through a comprehensive program of industry-driven applied research, graduate education, professional seminars, worker training, industry consulting and technology updates. The institute tracks worldwide technological developments — in areas such as electronics, computer systems, hydraulics and automation — and diffuses the information to benefit industry.

TURI was formed when the Massachusetts Legislature passed the Toxic Use Reduction Act in 1990. TURI is designed to help regional industry, while reducing the burden of toxic waste on the environment. TURI helps develop cleaner and safer production technologies for use within existing operations and helps new enterprises penetrate export markets.

Lowell's decision to focus on a limited portion of the R&D spectrum was part of a strategy to maximize its efforts in regional industrial development with the resources available to the campus. When the strategy was developed in 1981, New England boasted a richly populated R&D landscape. Indeed, the strategy depends on that landscape remaining fully covered by the collective contribution of all institutions.

Only then can the information which is needed to drive continuous regional industrial innovation be harvested and disseminated. Without this continuous innovation, there is little hope that the region can attain and sustain a competitive advantage. For a region to generate a wide variety of jobs that can pay a socially fair wage in the highly innovative global economy, it is necessary to develop and maintain a collective learning process, so the region's industries can learn at least as quickly as their competitors outside New England. The region's high level of R&D is one of the key vehicles for diffusing knowledge.

Lowell's strategy was not driven by lack of appreciation of the traditional university location toward the basic research end of the R&D spectrum nor by disenchantment with the traditional academic structure. It was driven by a wish to pursue the public benefit of economic development.

William T. Hogan is the chancellor of the University of Massachusetts at Lowell.

#### Defense Conversion: A Region Disarmed

#### THOMAS P. O'NEILL III

As New England continues to slog through a stubborn recession, economists, academics and policymakers postulate about the coming wave of opportunity that will refloat our collective economic boat.

The steep decline in manufacturing throughout New England in the 1980s was supposed to have leveled out and at least stabilized in this decade as various manufacturing sectors retooled, according to the experts. But manufacturing continues its remarkable slide today, joined by almost all other sectors of the New England economy. The fail-safe computer industries that invigorated New England in the 1980s have proven vulnerable to national and international competition as well as misdirected investments and other maladies that threaten virtually all businesses at some point in their growth cycles. The region then discovered that genetic engineering and biotechnology manufacturing, while promising, have not provided the jobs that some had hopefully forecast.

Perhaps most important, the main engine of our growth — the robust defense industry that created New England icons such

as Pratt & Whitney, Raytheon and General Dynamics — has begun to idle. We now find ourselves searching for a new industrial revolution. We even have a name for it: Defense Conversion.

With the dismantling of the Soviet military empire, there is little question that we need to move away from a military-based industrial economy. But the central question remains: Move toward what?

President Clinton pledged \$20 billion over five years to make the leap from warships to widgets a smooth one. The concept is promising enough that in April 1993, about 600 executives from companies across New England attended a seminar at the World Trade Center in Boston to find out how to apply for federal conversion funding.

The impact of vanishing defense spending is clear to major defense companies, and it is becoming clearer still to the thousands of smaller companies that form a defense-dependent chain of parts manufacturers, contractors and retail suppliers.

As William T. Hanley of Galileo Electro-Optics Corp. in Sturbridge, Mass. commented during the Boston meeting: "Anybody who thinks conversion [to commercial applications] is going to be short and sweet is mistaken. Engineering, hiring — everything you do now will have to be different."

One source of economic strength for New England in the post-defense-buildup era is the region's unparalleled university research and development enterprise. In 1991, federal R&D obligations to New England colleges and universities totaled \$1.5 billion, or \$112 per New Englander—the highest per-capita obligation of any region. University R&D holds the promise not only of new jobs, but of whole new industries unrelated to defense.

Yet even New England's vaunted R&D enterprise faces new pressures, as federal policies emphasize applied over basic research, increased accountability and geographic dispersion of R&D funds. (Additionally, research universities will have to undergo their own conversion from defense to civilian areas. In recent years, nearly \$1 in \$10 of New England university research has come directly from the Defense Department, while some funds from other agencies such as the Department of Energy have also been geared to military research.)

In its nascent effort to manage its own role in the conversion process, the federal government is attempting to impose more stringent rules for investing in research, annual obligation limits for federal conversion funds and deadlines for application filings. The process argues for an unprecedented level of cooperation among academic institutions as well as joint ventures between some of the emerging companies — large and small — and the academic institutions.

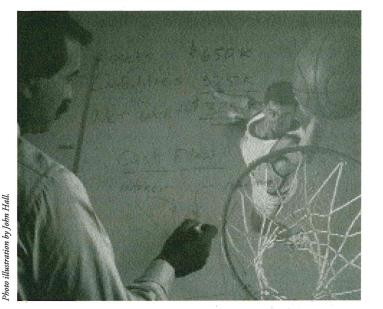
Seeking R&D funding is not the only endeavor in which New England's higher education institutions will have to cooperate with one another and with other sectors. The lifeblood of emerging technologies and new industries in this conversion period will be well-trained workers, so regional approaches to undergraduate and graduate curricula will also be needed.

The ideal role for elected government officials — at both the state and federal levels — is that of matchmaker. Collectively, government, academic and industry leaders need to begin forging a vision of where we want to go in a peacetime economy. The key players in New England's economy must organize the region's substantial human resources in the fields of government, industry and academia to inventory our ideas and chart a course for the post-Cold War industrial revolution.

It is inevitable that individual companies will pursue federal conversion funding on their own, just as they have pursued defense contracts. And they should. But it is also clear that to achieve the objective of reemploying New England workers and creating a secure economic future, the region's colleges and universities, companies and state governments must declare their common goals and work together to capitalize on regional strengths.

As New England scrambles to find its way in this era of defense conversion, the region must focus its limited resources on promising research and product development and the preparation of an educated workforce that can take a concept into production. Clearly, that will require a new level of regional and interdisciplinary cooperation.

Thomas P. O'Neill III, the chairman of McDermott/O'Neill & Associates, was lieutenant governor of Massachusetts from 1975 - 1982.



## Examining the *Trust* in Trustee

## Some Boards May Need a Lesson in Ethics

WILLIAM T. O'HARA

t was an almost offhand comment by a college trustee: "Bypass the bidding process. Take my word for it, our company will meet or exceed the college's requirements."

Some might argue there was nothing wrong with the trustee's offer. But the remark created a no-win situation for the college's new president. Even if he responded with the utmost tack and diplomacy,

choosing another vendor would leave the trustee dissatisfied. Choosing the

trustee's company, on the other hand, would create at the very least an appearance of impropriety.

In this case, the college had no conflict-of-interest policy. To complicate matters, board members were preoccupied with budgetary problems and dissatisfaction from a unionized faculty. They were not inclined to side with the brand new president against a powerful senior trustee used to getting his way—especially not over an "insignificant ethics issue." And so the offer was put forth as a simple one; the trustee assumed that, as in the past, his company would receive special consideration to provide a service the college needed.

It may have been naiveté, sheer madness or outright courage, but the president ultimately insisted that the normal bidding process be followed, with each provider submitting a proposal specifying the exact services to be rendered and their costs. Although it made him uncomfortable, the president allowed the trustee vendor to participate on equal terms with other bidders. After a two-month process, the trustee lost the bid to a competitor. His resentment lasted

for years. The relationship between the president and the trustee was never repaired, and two or three other board members continued to view the president's decision as the work of a self-righteous administrator.

This incident occurred more than a decade ago. In those days, little attention was paid to ethical issues facing trustees of higher education institutions. The public's respect and esteem for the academy and all it represented seemed immutable. Colleges and universities were seen as pillars of honesty and rectitude. It was always assumed that they were ethically sound. When a rare violation occurred, it was considered a matter for administrative attention and seldom involved any kind of board action.

But today, trustees are operating under increased scrutiny. The misuse of federal research funds, faculty plagiarism, the falsification of research results, questionable fundraising practices, athletic scandals and conflicts of interest have plagued a higher education community already weakened by shrinking budgets, tumbling enrollments and deteriorating facilities.

Most of the criticism of intercollegiate athletic abuses has focused on coaches, presidents, alumni and student athletes — but seldom on trustees.

Report after report of administrative and academic shenanigans has fostered a public suspicion of those serving in our institutions of higher education. Furthermore, there are increasing signs that the public is calling into question the role of those who hold the ultimate responsibility for the integrity of our colleges and universities the trustees. The recent controversy at Boston University involving President John Silber's business relationships with a university-sponsored commercial venture focused wide attention not only on Silber, but also on several BU trustees who provided services for profit to the university.

So far, trustee response to criticism from outside has been lukewarm. Most boards do not seem to feel a sense of urgency about the issue. Many trustees ignore or reject outright the fact that higher education's continued prominence in society and confidence in their own institutions are inextricably bound together.

The governing boards of higher education institutions still consist of men and women who bring prestige and wisdom to their service. As they have for decades, boards of trustees hire and fire presidents, manage budgets and raise funds. But the circumstances in which they work have changed. Trustees must realize their schools exist in a more complex society than the one in which they moved as undergraduates. Since Watergate, we have seen political corruption, lies and mismanagement erode trust in government. In this environment, colleges and universities suddenly face a public that is more questioning and less trusting. People want to know more about campus crime, academic standards for athletes and rising levels of racial and ethnic confrontation on campus.

Historically, Congress has been reluctant to involve itself in the administration of colleges and universities. But abuses in college sports ranging from low graduation rates for athletes at Memphis State University to the involvement of University of Nevada/Las Vegas basketball players with a convicted gambler have prompted congressional action. Last year, a bill was introduced to require that the National Collegiate Athletic Association (NCAA) be administered by a 33-member board of institutional chief executive officers. Other proposals before Congress would require institutions to disclose information on athletic expenditures related to recruiting, scholarships and coaching personnel.

It is unfortunate, but not terribly surprising, that the trustee response to intercollegiate athletic abuses by administrators has been negligible. In the wake of many of these incidents, the criticism has focused on coaches, presidents, alumni and student athletes — but seldom on trustees. Even in institutions faced with embarrassing violations — such as alumni boosters

at Southern Methodist University making improper under-the-table payments to varsity athletes — there has been little criticism of governing boards and few calls from trustees urging efforts to ensure integrity in college sports.

But calls intended to direct trustee attention to institutional ethics and social responsibility have, in fact, been delivered over the years. Derek Bok, the former president of Harvard University, has noted that trustees are

uniquely positioned to advance ethical discussions related to academic programming, teaching, research and administration. More recently, the Association of Governing Boards of Universities and Colleges has urged its members to place greater emphasis on the examination of their institutions' values, responsibilities and ethics.

Trustee reticence continues, however, perhaps fostered by the assumption that academics are somehow more likely to be ethical than their peers in business, government service and other professions. Perhaps, too, board members assume that their institutions, as nonprofit entities, do not in the normal course of events have to face many ethical dilemmas. Congressional scrutiny of research overhead and other events of the past few years should dissuade them of this naive conclusion. Colleges and universities of every size, type and mission have been damaged by the serious consequences of a variety of ethical lapses, ranging from charges of embezzlement at Brooklyn College to questions of sexual harassment at the University of Virginia.

Today's cynical climate demands broader governing board sensitivity to public concerns. The failure of trustees to educate themselves in ethical responsibilities will risk the college's reputation and even institutional autonomy. There is a growing threat that third parties — particularly Congress, government agencies and accrediting bodies — will step up their oversight if higher education is unable to keep its own house in order.

To safeguard public trust in higher education and Colleges and keep federal and state govuniversities suddenly face a public that is more questioning and less trusting. People want to know more about campus crime, academic standards for athletes and rising levels of racial and ethnic confrontation on campus.

ernment oversight to a minimum, trustees should consider adopting several fundamental procedures. A few of the following recommendations are borrowed from the corporate world; others are uniquely applicable to campus governance. All will help position boards to properly gauge the ethical climate of their campuses, to ensure appropriate accountability and to anticipate possible problems. Trustees should:

- 1) Require an annual report from the president related to ethical issues and practices on campus, including a description of the extent and nature of ethics as an academic subject.
- 2) Endorse a conflict-of-interest policy, requiring each trustee to complete a disclosure statement and implementing a procedure whereby conflict-of-interest issues can be dealt with by the board and not by the president.
- 3) Appoint a trustee Ethics Committee to review the institution's conformance to ethical standards.
- 4) Require the president to address the campus community each year concerning the school's commitment to ethics.
- 5) Adopt a written code of ethics for institutional officials.
- 6) Provide seminars on ethical issues to acquaint staff members with ways to cope with ethical dilemmas.
- 7) Appoint an ombudsman to investigate and be consulted on ethical problems that may occur.

- 8) Draft a mission statement reflecting the school's commitment to ethical values.
- 9) Review the institution's policies and practices every two years.
- 10) Establish procedures which require trustees to act promptly, fairly and emphatically when violations occur.

Paul N. Ylvisaker, the late dean of the Harvard University School of Education, pointed to genetic research as an area where trustees would have to step in and confront ethical challenges.

"Can we trust the individual scholar's determination when that person has become heavily involved in commercial activity and the tempting calculus of the market?" asked Ylvisaker, adding: "I can't see any alternative for trustees than to assume some of the ethical responsibilities that have traditionally been claimed by the individual educator — or at least to share."

More recently, 36 concerned college and university trustees signed an "urgent open letter" published in *The Chronicle of Higher Education*, calling for better monitoring of ethics in institutional performance.

In another warning, Richard T. Ingram, president of The Association of Governing Boards of Universities and Colleges, noted, "The public trust in higher education has been severely shaken by a decade of ... scandals stemming from the misallocation of indirect cost funds, athletic abuses and allegations of price fixing ... All our institutions are tainted by the improprieties of a few."

Ingram correctly explained that the mistrust generated by these acts and accusations has marked the end of higher education's sanctuary.

With the walls of the academy crumbling, it behooves college and university trustees to consider some or all of the warnings and suggestions regarding ethical guidelines. Boards will function at their own peril if they ignore the measures necessary to best conduct their duties in the realm of ethics — measures they surely owe to their individual institutions and to the public at large.

William T. O'Hara is president emeritus and professor of business ethics at Bryant College. He was a member of the NCAA Presidents Commission from 1984 to 1989 and in 1991 chaired the Rhode Island Governor's Ethics Task Force.

# Local and Inequitable

### Financing New England's Public Schools

Il six New England states boasted more public school revenue per pupil than the U.S. average of \$6,224 in the 1992-93 school year, according to new data from the National Education Association (NEA). Per-pupil revenues in New England ranged from \$6,371 in Maine to \$9,385 in Connecticut. But that's where the good news on New England's public school financing ends.

When New England's comparatively high personal incomes are taken into account, the support of public schools looks much less generous. Americans on average devote 4.6 cents of each dollar they earn to public schools, according to the New England Board of Higher Education's analysis of the data. Rhode Islanders devote 4.3 cents per dollar of personal income, while New Hampshirites provide 4.2 cents per dollar. Massachusetts residents direct a paltry 3.7 cents of every dollar of personal income to public schools.

More bad news: The NEA revenue figures reflect state averages. Yet, increasing reliance on local property taxes to fund public schools creates wild variations from one community to another within a state — a system that courts in 28 states have found unconstitutional. In June, the Massachusetts Supreme Judicial Court ruled that the state had failed to meet its constitutional responsibility to provide adequate and equitable education for all its students. The decision on the nearly 15-year-old lawsuit by students from property-poor school districts highlighted the inequalities between the resources of schools in wealthier communities and those in poorer ones. Boston University, which filed a brief in support of the lawsuit, found that in 1989-90, for example, affluent Brookline spent nearly \$2,000 more per pupil than Chelsea, the state's poorest city, whose school system is managed by BU.

State revenues can be used to help poorer communities support their schools. But Masssachusetts public schools suffered an 8 percent decline in *state* support from 1988 to 1993 — the only such decline in the nation. And Massachusetts and New Hampshire are the only states in the country that budget more for Medicaid than schools, according to the National Conference of State Legislatures.

In Massachusetts, the court outlined seven broad capabilities that every educated child must possess, ranging from a "sufficient grounding in the arts to enable each student to appreciate his or her cultural and historical heritage" to a "sufficient level of academic or vocational skills to enable public school students to compete favorably with their counterparts in surrounding states in academics or the job market."

"Equity doesn't necessarily mean 'equal,' but it has to mean at least 'adequate,' now," says Norma Shapiro, who handles legislative issues for the Civil Liberties Union of Massachusetts and served on the Council for Fair School Finance, which

supported the suit. "Once you define 'adequate' and set a level of what that costs, then you can say, 'This is at least what everybody has to spend.' Once all communities are spending at an adequate level, it doesn't matter if some towns want to spend more."

A single judge will be watching how Massachusetts state officials deal with the problem. And the other New England states will be watching Massachusetts.

<b>Local Share of School Revenues</b>			
Connecticut	55%		
Maine	41%		
Massachusetts	63%		
New Hampshire	89%		
Rhode Island	54%		
Vermont	62%		
New England Average	60%		
U.S. Average	46%		

## Minority Share of Bachelor's Degrees: Still Dismal

The share of bachelor's degrees awarded to African-Americans, Hispanics and Asian-Americans grew faster in New England between 1985 and 1990 than nationally, according to a new analysis of U.S. Education Department data by the New England Board of Higher Education. But then, the region had farther to go to achieve full minority participation in higher education — and it still hasn't done so.

African-Americans comprised 4.4 percent of New England's population in 1990, but received only 2.7 percent of bachelor's degrees. Hispanics made up 4.3 percent of the region's population, but received just 1.8 percent of bachelor's degrees. Only Asian-Americans were "overrepresented," accounting for 1.7 percent of the population, but 2.9 percent of bachelor's degrees. (Native Americans represented 0.2 percent of the region's population and 0.3 percent of bachelor's degrees awarded by New England institutions.)

All the minority groups comprised a significantly larger share of bachelor's degree recipients nationally.

However, while the percentage of bachelor's degrees awarded to African-Americans increased slightly in New England, the African-American share nationwide declined slightly — one more sign that cuts in federal financial assistance and the erosion of civil rights programs during the 1980s have hurt Black participation in higher education.

At New England's 50 largest colleges and universities — which accounted for 78 percent of the region's minority bachelor degree recipients in 1990 — progress in graduating minorities has been mixed. From 1985 to 1990, the share of bachelor's degrees going to African-Americans rose at just 26 of the 50 largest institutions; the Hispanic representation increased at 31 of the campuses; and the Asian-American share grew at 40.

The tables show the fastest gainers among New England's 50 largest institutions ranked by percentage-point increases in the share of bachelor's degrees conferred on African-Americans, Hispanics and Asian-Americans.

### **AFRICAN-AMERICAN REPRESENTATION** Class of '85 Class of '90 Point Change University of Massachusetts at Boston 3.3% +2.0 1.2% 3.2% Connecticut College Eastern Connecticut State University 1.7% 3.5% +1.8 Western Connecticut State University 1.6% 3.0% +1.4University of Massachusetts at Amherst 0.7% 2.0% +1.3Wellesley College 3.6% 4.9% +1.31.1% 2.2% Middlebury College +1.1 Worcester State College 0.2% 1.2% +1.02.2% 1.3% +0.9**Boston College Bryant College** 0.2% 1.1% +0.9Bentley College 0.4% 1.2% +0.80.5% 1.1% +0.6 University of Rhode Island 0.9% Bridgewater State College 1.5% +0.62.2% **Boston University** 2.6% +0.4Southern Connecticut State University 4.5% +0.44.9% Central Connecticut State University 2.5% 2.9% +0.41.4% 1.8% +0.4Salem State College 2.5% 2.7% +0.2 **All New England Institutions All U.S. Academic Institutions** 5.8% 5.6% -0.2

HISPANIC REPRESENTATION				
	Class of '85	Class of '90	<b>Point Change</b>	
Massachusetts Institute of Technology	3.0%	5.1%	+2.1	
Radcliffe College	4.1%	5.8%	+1.7	
Springfield College	1.2%	2.7%	+1.5	
Boston University	1.2%	2.5%	+1.3	
Tufts University	1.1%	2.3%	+1.2	
Connecticut College	1.2%	2.3%	+1.1	
Bryant College	0.1%	1.2%	+1.1	
Bentley College	1.8%	2.8%	+1.0	
Dartmouth College	0.6%	1.6%	+1.0	
University of Massachusetts at Amherst	1.1%	1.9%	+0.8	
Yale University	2.9%	3.6%	+0.7	
Salem State College	0.5%	1.2%	+0.7	
Worcester State College	0.2%	0.9%	+0.7	
Boston College	3.1%	3.6%	+0.5	
University of Massachusetts at Dartmouth	0.1%	0.6%	+0.5	
Framingham State College	0.0%	0.5%	+0.5	
All New England Institutions All U.S. Academic Institutions	1.3% 3.7%	1.8% 4.1%	+0.5 +0.4	
All U.S. Academic Institutions	00000			

ASIAN-AMERICAN REPRESENTATION				
	Class of '85	Class of '90	Point Change	
Wellesley College	5.9%	17.0%	+11.1	
Massachusetts Institute of Technology	8.6%	17.4%	+8.8	
Boston University	2.2%	6.9%	+4.7	
Dartmouth College	1.3%	5.8%	+4.5	
Harvard University	6.6%	10.4%	+3.8	
Worcester Polytechnic Institute	0.3%	3.6%	+3.3	
Brown University	4.4%	7.4%	+3.0	
Radcliffe College	7.6%	10.5%	+2.9	
Middlebury College	0.0%	2.8%	+2.8	
Yale University	6.6%	9.2%	+2.6	
University of Massachusetts at Lowell	1.4%	3.4%	+2.0	
New Hampshire College	0.0%	2.0%	+2.0	
University of Massachusetts at Boston	0.8%	2.7%	+1.9	
Boston College	2.8%	4.5%	+1.7	
Wesleyan University	3.8%	5.3%	+1.5	
Connecticut College	1.0%	2.5%	+1.5	
All New England Institutions All U.S. Academic Institutions	1.7% 2.6%	2.9% 3.6%	+1.2 +1.0	



# Its Primary Care, Stupid! Health Care Reform's Message to Medical Schools

NEIL ROLDE

hen the national examination of health care services inevitably turns to how doctors are trained, the dislocations for New England medical schools could be severe. For starters, much of the debate over health care reform has centered on expanding the ratio of primary care physicians to specialists in American medicine. This is heralded as a quick and effective way to reduce costs, since primary care

Medical schools
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primary care.
For example,
institutions can
give admissions
preference to
students who
want to devote
themselves to
family care.

doctors are paid much less than specialists — in some cases, only about half as much. But most U.S. medical education is geared toward preparing specialists.

Other industrialized nations such as Canada, England, France and Germany provide health care for all their people, while maintaining a ratio of roughly 70 percent primary care doctors and 30 percent specialists. In the United States, the figures are reversed. Of 600,000 physicians, 400,000 practice specialties or subspecialties. Meanwhile, millions of Americans who cannot afford health insurance, but are not poor enough to qualify for government assistance, go without basic care.

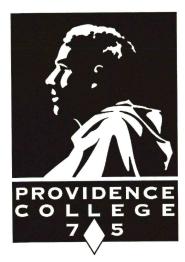
If the 1992 Clinton campaign message was "It's the economy, stupid," the new refrain on health care reform could well be, "It's primary care, stupid."

What does the demand for more general practitioners mean for medical education in the United States and New England? And conversely, how does medical education influence the current mix of primary care physicians and specialists? As one practicing cancer specialist in Texas recently wrote in the

New York Times, "The American medical school curriculum is designed to teach acute care and high-tech medicine. It is time to reverse this trend."

Any reversal will have a major impact on New England. The position of the region's medical schools among the nation's finest is indisputable. Students around the world clamor for admission to the prestigious halls of medical learning from Yale to the University of Vermont. And Boston is a Mecca for patients seeking sophisticated medical care. Institutions such as Massachusetts General Hospital, Beth Israel Hospital, Brigham and Women's Hospital, the Dana Farber Cancer Institute, Children's Hospital and the Leahy Clinic are symbiotically linked to Massachusetts' great complex of medical learning, as are leading hospital centers in the other New England states.

Health care has been one of New England's few growth industries throughout the recession. In 1991, Massachusetts hospitals alone purchased more than \$8.5 billion in goods and services, employed 155,000 workers (not counting doctors and trainees), and garnered \$619 million in National Institutes of Health



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research grants — more research dollars per capita than any other state, according to the state's hospital association. New England institutions have long stood at the cutting edge of the world's most sophisticated, hightech health care. But Americans now realize that these same institutions represent the world's most expensive — and least accessible — health care system.

The total U.S. health care bill for 1993 will soar to an estimated \$940 billion and account for 14 percent of the gross national product, up from 12.3 percent in 1991. At the same time, at least 37 million Americans have no health insurance, and an additional 50 million have inadequate coverage.

Without a change in the thinking of those who educate future doctors, health care reform will fail, regardless of the system eventually adopted. One important step is for medical schools to place more emphasis on preparing primary care physicians.

Today, powerful financial incentives steer medical school graduates toward lucrative specialties. According to the American Medical Association, the mean income in 1991 for primary care family practitioners was \$111,000. The mean income for surgeons, on the other hand, was \$234,000; for radiologists, \$230,000. The difference can be compelling for the new doctor who graduates from medical school owing, on average, more than \$100,000 in education loans.

Attitude can also be a problem. Prestige has been attached to high-tech medicine for so long that it will take a revolution in thinking to change course. The vested interests are found not only in academic medical centers. Huge economic investments by the medical industry ride on the continued sale and use of specialty equipment, as well as state-of-the-art pharmaceuticals.

Still, medical schools can adopt strategies to emphasize primary care. For example, institutions can give admissions preference to students who want to devote themselves to family care. The schools can arrange for students to train with primary care doctors and in community health centers, rather than in high-tech hospitals. They can encourage students to work in interdisciplinary teams with other health providers, such as nurse practitioners and physician assistants.

The personal debt problem that drives so many students into specialization could be solved if government assumed more medical education costs, particularly to encourage students to pursue primary care. Such assistance could be offered at a reasonable cost. All medical education in the United States costs \$1 billion annually — a mere trifle in comparison to almost \$1 trillion in health care costs.

The Robert Wood Johnson Foundation is also trying to attract more medical students to primary care. The foundation's Generalists Physician Initiative is investing more than \$30 million to convince U.S. medical schools to make their curricula more "primary-care friendly." The first round of support came in the form of planning grants awarded to 18 out of more than 80 applicants in the fall of 1992. The 18 will now compete for 12 final awards.

Five of these preliminary winners were New England institutions. Notably, the University of New England College of Osteopathic Medicine (UNECOM) of Biddeford, Maine, was the only osteopathic medical school in the country chosen for a planning grant. Osteopathic medical education provides students with the same grounding in basic science as more traditional allopathic education. But the osteopathic philosophy emphasizes treatment of the whole person, not just the disease. Almost 70 percent of UNECOM graduates go into primary care.

President Clinton's high-profile appointment of his wife, Hillary Rodham Clinton, to head up a special commission on health care signaled his resolve to deal with the issue immediately. But if health care reform is to produce incentives for medical schools to emphasize primary care, the first step will have to be a change in mindset about what kind of practice is prestigious. The current emphasis in health care reform discussions on the key role of primary care shows some progress has already been made. The federal government's relative value payment scale -which reimburses specialists at a lower rate than primary care physicians — is another positive sign. But meaningful reform may require more significant government initiatives, such as basing federal support for medical schools on training an increased number of primary care providers.

Neil Rolde is a former Maine state representative and the author of Your Money or Your Health. He is a trustee of the University of New England and former NEBHE delegate.



# Regionalism: All Aboard

JAMES P. REPASS

ot long ago, a business friend of mine said goodbye to New England, and took his import-export business with him. He is an Englishman and — like many of his countrymen — loves New England, especially Boston, above all other places American.

I naturally asked my friend, given his proclivities, why leave? His answer was short and to the point: "I just can't get around, mate." Just as

The economic impact of high-speed rail will continue to be felt for decades, as commerce and tourism follow the rail lines. It's a sort of regional application of the "Field of Dreams" argument: If you build it, they will come.

importantly, neither could his company's goods. And so he was leaving and taking jobs and commerce with him — to New Jersey.

I was thinking about my English friend and his comments when I read and then reread the "Essays on Interstate Cooperation" published in the Spring/Summer 1992 issue of CONNECTION. As we contemplate the smoldering debris of New England's economy and await the next round of reductions in defense spending, the call for greater regional cooperation and planning has not gone entirely unheeded.

Four years ago, the Northeast Corridor Initiative, then little more than an idea, today an active federally registered nonprofit corporation, began to put together an alliance of business, academic and government leaders from throughout New England and New York state to ensure that after many false starts, high-speed rail at last would come to the United States, beginning here in the Northeast.

Like so many "action" groups, the Northeast Corridor Initiative came into being because of person-

al experience: In early 1989, I decided that I had circled Boston in an airplane one time too many and resolved to do something about it. But the option of train travel didn't guarantee efficiency either. I called Amtrak President Graham Claytor to ask why the 231-mile train trip from New York to Boston took four to five hours.

I learned from Claytor that electrification, with other infrastructure improvements, would cut travel time from Boston's South Station to Penn Station in the heart of Manhattan down to three hours or less — in most cases, faster than taking a plane and fighting airport traffic. But in 1989, there was no funding for electrification.

To help find the funding, the Northeast Corridor Initiative took a deliberately regional approach. Our purpose was to convince the general public, the media and the political and business leadership of New England that a modernized ground transportation infrastructure is an absolute must if we are to compete with Europe and the rest of the United States for jobs, investment and tourism. The recent

decline of industries that have been central to our regional economy — minicomputers and defense, for example — combined with the growing competitiveness of other nations and regions in world markets should spur New England leaders to action.

Our recent history, however, is somewhat disheartening. President Reagan drastically reduced funding for the Northeast Corridor Project in 1981, and Congress remained unwilling to invest in modernizing ground transportation infrastructure throughout the decade. By April 1989, practically no funds were available for capital improvements to the corridor. That made it doubly important to activate New England businesses to support modernization of the corridor; today, the Northeast Corridor Initiative seeks to develop alternative funding mechanisms for infrastructure, recognizing that tax dollars can go only so far, and that the private sector must become involved in the effort to rebuild the region's ground transportation infrastructure.

Our initiative was undertaken by private citizens who recognized that nonpartisan regional support was necessary if New England ever were to see high-speed rail similar to that operating in Europe and Japan.

Taking an approach that involves business and government leaders from every New England state and Canada too, in a consciously nonpartisan manner, we have begun — *just begun* — to see the fruits of a coordinated regional effort.

Indeed, \$448 million has been appropriated for the project over the past three years, starting with \$125 million in 1990. In addition to encouraging a newly proactive rail transportation stance in Congress, we won from the Bush administration a promise of "OK, OK. No more body blocks" against corridor capital funding, in the words of one White House budget official. With the Clinton administration's pro-rail policy, we hope to see an even more active federal effort, although the need to cut the budget deficit will restrict the support.

Few New Englanders are aware that after decades of abandoned plans and aborted projects, the fundamental subsystems to permit three-hour service between Boston and New York are in fact funded. The installation of high-speed signaling is largely completed; high-speed crossovers are being built; and, electrification from New Haven to

Boston, the last non-electrified gap between Washington and Boston, is to be started in late 1993 or early 1994.

The money so far appropriated is only a start, and the task is far from complete. Another \$450 million is needed for additional infrastructure improvements to permit "true" high-speed rail, able to handle sustained speeds of 125 miles per hour or above, and still \$450 million more is needed for new trains. But the foundation for threehour service between Boston and New York is at last being put in place. The next steps should be high-speed rail between Boston and New York via Albany, between New York and Montreal via Albany, between Boston and Portland, Maine, and on up to Canada's Eastern provinces, and between Boston and Montreal. The economic impact of high-speed rail will continue to be felt for decades, as commerce and tourism follow the rail lines. It's a sort of regional application of the "Field of Dreams" argument: If you build it, they will come.

Equally important, the federally appointed Infrastructure Investment Commission recently called for the kind of public/private partnership bonds that the Northeast Corridor Initiative began developing four years ago. These bonds would be purchased by the private sector to support infrastructure projects, and would carry a full or partial federal guarantee. If this new mechanism finds support in Congress, it will permit pension fund managers - with their deep pool of capital — to invest safely in infrastructure projects that otherwise would be considered too risky. One such project could be the proposed rail link between Boston's North and South stations, which has very broad support, but may be hard to finance.

What does all this have to do with NEBHE's call for greater regionalism in New England? Everything. Had the Northeast Corridor Initiative been a one-state organization, or an industry trade group, instead of a regional organization of private citizens, the prospects for high-speed rail in New England would be grim. It is almost certain that the project would not have survived federal funding battles. Even today parochial problems remain in certain parts of the region.

Twice during the past four years, the Northeast Corridor Initiative has had to intervene to prevent the high-speed rail pro-

ject from being killed. Two years ago, our frantic efforts to alert Amtrak to its problems in Congress were ignored until an eleventh-hour telephone call from a concerned congressman who asked us to set up a meeting of the principals. That meeting led to restoration of \$155 million for the project. That the project was saved at all is surprising, and that it was saved by an unofficial, informal coalition, with a fraction of the resources of more established groups, makes it all the more remarkable.

Although last year brought a renewed threat of elimination of corridor funding, the timely and aggressive assistance of the New England Council under its new president, Peter Meade, made restoration of funds much less dicey. It is instructive that when a regional business group such as the council joined hands with the Northeast Corridor Initiative, victory was swifter. The lesson: Cooperation among regional organizations works.

This year, the New England Council joined the Northeast Corridor Initiative, Trainriders Northeast (an activist group based in Maine that won federal funding for Boston-to-Portland rail service to begin in 1994), a major regional law firm, Bostonbased Peabody & Brown, and investment bankers, Bear Stearns and First Boston, in presenting a conference, "The New Northeast Corridor and the Economic Revival of New England and the Northeast" to further bolster efforts on behalf of regional passenger and freight rail development. Those gathering at the conference honored U.S. Sen. Claiborne Pell (D-RI) whose vision regarding transportation development is especially evident in his book Megalopolis Unbound.

Clearly, there is a future in New England regionalism if we care to nurture it. The story of high-speed rail in many ways is a chicken-egg story. A vibrant spirit of regionalism is essential to the success of an improved rail transportation system in New England. The system, in turn, will form the basis for increased regionalism as New England's business leaders, policymakers, faculty and students find themselves closer to one another.

James P. RePass is the president and CEO of the Northeast Corridor Initiative, which is headquartered in Providence.



# Academic Budgeting In New England, the old model prevails

ew England's private liberal arts colleges have made little progress in encouraging department chairmen to participate in academic budgeting decisions, according to an unpublished study by Harold F. De Bruyn, a former corporate controller and college comptroller who examined academic budgeting as part of his doctoral work at Northeastern University. De Bruyn surveyed nearly 300 department chairmen at 19 of the

region's private, four-year liberal arts colleges to find out whether the institutions had heeded the advice of a group of higher education finance experts who in the early 1970s proposed revamping the academic budgeting process to deal with more difficult fiscal times.

Those experts argued that colleges and universities were entering an increasingly competitive period when academic budgeting would be recognized as a management tool. In 1973, George Kaludis, then vice chancellor of operations and fiscal planning at Vanderbilt University, noted that affluent times had ended for higher education; no longer would budgeting be a simple matter of "recording at year's end those commitments made during the year."

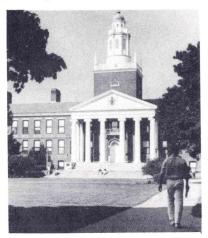
Kaludis and others recommended that colleges and universities adopt new academic budgeting practices to improve financial control and management flexibility. Major recommendations: 1) The chief academic officer (CAO) — whether an academic vice president, provost or dean — should have the operating responsibility for the academic budget;

2) All department chairmen should take part in budgeting; 3) "Financial openness" should be achieved by making relevant information available to all who participate in budgeting, rather than asking department chairs to navigate in the dark; and 4) All academic administrators, from the president to department chairmen, should be trained in financial budgeting.

De Bruyn finds that New England colleges have made substantial progress in putting responsibility for academic budgeting decisions in the hands of academic officers. In the 1970s, chief financial officers (CFOs) were generally in charge of all campus budgeting, including academic budgeting. But today, at nearly half the colleges surveyed (47 percent), department chairmen receive budget expense guidelines and send completed budgets to their chief *academic* officers. At an additional 21 percent of the colleges, the CAO is in charge of academic budgets, but shares some of the responsibility with the CFO.

Still, 92 department chairmen at six institutions say their academic budgets are solely the responsi-

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bility of the CFO, or in one case, of the CFO and a budget officer. Notes De Bruyn: "Making a department chair accountable to a CFO for financial outcomes and to a CAO for educational outcomes weakens the lines of authority, responsibility and accountability."

De Bruyn also explains that CFOs and

Ideally, an academic

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one-year budget

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CAOs view budgets differently. "CFOs see budgets as fences, because they are not responsible for the educational goals to be achieved. They are the police, reporting on someone else's budgetary infractions," he observes. "When CAOs do their own academic planning, budgeting and monitoring, the budget restrictions become guidelines for their academic plans."

As for the recommendation on participation by department chairs, only 27 percent of the chairmen say they attend budget planning meetings with their counterparts from other departments — and most of them are concen-

trated in just four colleges. However, 63 percent of department chairmen at all 19 colleges report holding budget planning meetings with faculty members.

Virtually all department chairmen project department expenses, while none projects faculty salaries and benefits. In most cases, knowledge of and responsibility for salaries and benefits appear to be limited to presidents, CAOs and CFOs, De Bruyn reports. At a few colleges, department chairmen project staff salaries. More than half of department chairmen project capital expenditures. But interestingly, only 31 percent report reviewing their budget and actual results with their CAOs.

Progress toward "financial openness" has been extremely limited, according to De Bruyn. Almost all department chairmen receive monthly reports on their department's expenditures, comparing actual results with budget amounts on both a monthly and year-to-date basis. But the centralized control of financial information

that characterized college budgeting before 1973 is still very evident. Thirty percent of the department chairmen say faculty salary and benefit information is available only as single line total in the monthly reports; the remaining 70 percent receive no salary information on their expense reports, and therefore do not see the true financial con-

ditions of their departments, let alone their institutions, De Bruyn says. Indeed, even among those department chairmen who do meet with their counterparts either regularly or sporadically - less than 10 percent say they have access to any institutionwide numbers. absence of such campuswide information, De Bruyn says, leaves the department chairs to budget in a vacuum.

The recommendation on training has been largely ignored. Only 5 percent of department chairmen report having any *formal* budget training in their current insti-

tutions. About 45 percent report receiving some *informal* training at their current institutions, mostly from other department chairs or secretaries. (In fact, De Bruyn reports that secretaries are responsible for the control, responsibility and necessary minimum monitoring of budgets in some cases, where department chairs have successfully avoided the task.)

Ideally, an academic department's budget should be the result of a process that begins with strategic planning and moves through multiple-year goals and multiple-year budget planning to reach a one-year budget projection. But De Bruyn says many department chairmen view budgeting as a necessary evil at best. And the region's colleges have done little to change that perception. The former comptroller concludes: "Not taking advantage of the department chairs' or faculties' potential contributions to the planning and budgeting process is wasting available and needed resources."

— J.O.H.

# The G.I. Bill at 50

The following is adapted from an unpublished manuscript by Michael J. Bennett about the origins of the G.I. Bill. Bennett is a former reporter for the Boston Herald and The Boston Record-American and a former congressional fellow of the American Political Science Association. Harvard University historian Donald Fleming has commented that Bennett's synopsis will "smoke out a great many reminiscences and snowball considerable interest in this almost forgotten saga."

here can be little question that the impact of the G.I. Bill of Rights transcends that of all the legislation passed during the New Deal and Great Society. Yet no record of the bill's passage can be found in the history books used in the colleges and universities that were its primary institutional beneficiaries. Only one journalistic account of the period, Joseph Goulden's *The Best Years 1945-50*, refers extensively to the bill. Only one scholarly account, *The G.I. Bill, the Veterans and the College* by Keith Olson, a history professor at the University of Maryland, has emerged from the ranks of the thousands upon thousands of social writers and commentators whose education was financed by the bill.

In literature, the bill serves as the backdrop for only one novel, *The Crack in the Picture Window* by John Keats. The plot, however, revolves around a character who inexplicably defaults on his Veterans Administration mortgage. In fact, almost none of the nearly 5 million who took advantage of the bill to buy a home did default. World War II veterans proved to be infinitely better credit risks than the considerably more affluent students of the '70s and '80s. ...

Why hasn't the full story of the G.I. Bill been told? Perhaps because its beneficiaries became so preoccupied fighting communism, they didn't stop to think about what democracy had wrought in the G.I. Bill. Perhaps because the American Legion was the principal legislative sponsor of the bill, and the Hearst Newspaper Corp. and papers such as *The Boston American*, its greatest supporters. Perhaps because the grandchildren of pioneers appreciate their heritage more than the children of pioneers. ...

Most likely, the story of the G.I. Bill has been conveniently ignored because it doesn't fit into any political paradigm, doesn't affirm any sociological pieties, endorse any ideology or philosophy, liberal or conservative, and above all, cannot be claimed as the product of any great man or woman or movement. The law was produced not by the educated, not by the politicians, not by industry, certainly not by liberals, unions or state planners, and most assuredly, not by market conservatives, but rather by entirely ordinary people who in their time and ours would probably be dismissed by us as not the right kind, not our kind, not the kind we have become largely because of the G.I. Bill.

These ordinary people succeeded despite opposition from the most powerful education leaders of the time. The G.I. Bill would turn the nation's colleges and universities into "educational hobo jungles," warned Robert Hutchins, president of the University of Chicago. The bill was "distressing" to Harvard's president, James Conant. "The bill is clearly a scheme to push people beyond what their intelligence admit," sniffed Conant. "It does not distinguish between those who can profit most from an advanced education and those who cannot ... We may find the least capable among the war generation flooding our campuses."

The G.I. Bill's unlikely and remarkable founding fathers (and *mother*, Rep. Edith Nourse Rogers of Lowell, Mass.) who pushed the law through Congress were all White, middle class, small town Rotarians. One was a notorious racist and anti-Semite, who later became the biggest stumbling block to passage of the law. Far from being progressive, many were strongly, even violently anti-communist, anti-New Deal and anti-labor. Culturally, most would have been counted among the Philistines and Yahoos of the time, people who may have joined the Book-of-the-Month Club, but rarely read the books, people to whom Norman Rockwell was high art. Yet they were Americans with a vision that transcended that of all their contemporaries. ...

Only a few weeks of planning had gone into the demobilization of the enormous military force that fought World War I. No provision was made for mustering out pay or reemployment assistance for the 4 million soldiers, sailors and airmen dumped back on the economy. The sight of veterans, still in their uniforms, selling apples on the streets of American cities had become commonplace. Hobos in uniform rode trains from town to town, begging for work. ... But the people who conceived the G.I. Bill had the foresight — when the government, industry and enlightened thinkers did not — to know that an even greater "Red Scare" could occur after World War II if 12 million, rather than 4 million, exservicemen were selling apples or riding the rails. ...

The bill provided veterans with vocational and educational opportunities; loan guarantees for houses, farms or small businesses; hospitalization; unemployment benefits and job placement. Between 1944 and 1949, about 9 million veterans received an average of 17 weeks of unemployment benefits under the bill, which eased their transition back into civilian life and may very well have staved off another Depression and the rise of an even greater menace to democracy than Joe McCarthy.

As the 50th anniversary of the bill approaches, there are new mutterings about "national service" and educational "vouchers." Those two phrases incorporate the two basic principles of the G.I. Bill: reward for service in the national interest and free choice of educational institution unfettered by ability to pay. (Those remarkably foresighted and generous provisions of the original World War II bill were struck from the much more limited Korean and Vietnam

bills. Those two wars, especially Vietnam, simply weren't as popular as World War II.) ...

Understanding the origins of the G.I. Bill may help resolve today's apparent dilemma of accommodating both equality and merit ... What the G.I. Bill said to returning veterans was simply this: "You can go wherever you want and as far as you can — if you've got what it takes. Don't worry about whether you can pay the tuition at a private institution if it's the best place for you to go. Just concern yourself with whether you can meet that institution's standards. You had nothing to do with the historical circumstances under which colleges and universities became private or public; you don't have to worry about the way your bills will be paid there. As long as you can get in and stay in and graduate with a degree, you will have earned it entirely through your own work." ...

Under the G.I. Bill, any veteran with the desire, intelligence and determination could go to a college or university of his or her choice with tuition fully paid. From 1945 through 1956, 7.8 million veterans enrolled in education programs under the bill: 2.2 million in four-year colleges; 3.5 million in two-year colleges and technical programs; 1.4 million in on-the-job training; and 700,000 on farms. Since then, virtually every U.S. organization of every type and size has been run at one time or another by beneficiaries of the G.I. Bill.

The bill's impact on higher education was explosive. In New England, enrollments at institutions such as Colby College and Boston College doubled almost overnight. Everywhere, war-surplus Quonset huts served as temporary classrooms, where teachers would shout over the sound of jackhammers digging out foundations for new academic buildings. New York didn't have a public university, and the private institutions were full, so the State University of New York system was started from scratch. Quota systems limiting the hiring and enrollment of Jewish and Catholic faculty and students quietly disappeared. A pronounced emphasis on the practical over the academic soon became evident. Graduate programs proliferated, and the word "specialist" became part of the vocabulary, as doctors flocked to postgraduate programs. ...

While Europe was being rebuilt with the aid of the Marshall Plan, America was peacefully undergoing a revolution at home. The G.I. Bill was creating personal and social independence, rooted in education and homes. Moreover, the influence of the G.I. Bill has extended far beyond the immediate postwar years, implicitly opening up social rights for minorities in a society in which a middle class life rapidly became the norm, making possible social opportunities — and claims — particularly for education, but also for jobs, housing and upward mobility far beyond the purely legal rights guaranteed under the original Bill of Rights. ... By extending opportunities and opening possibilities never previously contemplated and certainly not previously

demanded by Americans, the G.I. Bill laid the foundation for the later civil rights campaigns of racial minorities, women and the disabled, in the 1960s, '70s and '80s. ...

Before 1945, higher education was reserved for a privileged few. Fifty years after the passage of the bill, a political and cultural climate has been created in which going to college has become the social norm. ...

The G.I. Bill also changed *where* Americans live. The first G.I. families were pioneers in the suburbs. As of the 1990 census, suburbanites are the majority in the United States.

The bill paid back every dime invested many times over and continues to produce billions of dollars in dividends to the U.S. Treasury in the form of increased taxes paid by better-educated — so better-paid — beneficiaries. Perhaps even more remarkably, the law almost exclusively benefited GIs, rather than lawyers and other professionals. ...

When Congress approved the bill in the summer of 1944, an old world was dying in Europe, and a new world was being born in the United States. It would not be a world of "gold in the streets," "a full lunchpail," "a chicken in every pot" or even a car in every driveway. Instead, it was the reality of millions of people going to college from families where parents had never graduated from grammar school. It was a revolution not of rising expectations, but of rising realities, as millions of veterans jammed into garages and converted Quonset huts to seek the college degrees that would be their passports to splitlevels, ranch houses, "good schools" and the lifestyles that have begotten every other lifestyle since. ...

# Clean Exports

The following is excerpted from May 1993 remarks by U.S. Rep. Gerry E. Studds before Congress. The Massachusetts Democrat was introducing the National Environmental Trade Development Act, designed to improve the U.S. position in the international market for environmental technologies by increasing exports of U.S. environmental products and services.

his bill has two simple purposes: create American jobs and protect the global environment. How can anyone object?

In his 1993 Earth Day address, President Clinton called on the secretary of commerce, in cooperation with the secretary of energy and the administrator of the Environmental Protection Agency, to develop an interagency strategic plan to increase exports of U.S.-made environmental technologies and improve the competitiveness of those technologies. I applaud the leadership of President Clinton in recognizing that the United States has developed environmental technologies which the world needs and that we have to explore new ways of get-

ting these technologies to the global marketplace. Creating linkages between U.S. know-how and foreign markets in need of this know-how requires a partnership between the government and the private sector. The National Environmental Trade Development Act establishes this partnership.

What are environmental technologies? Broadly speaking, they are technologies, goods, and services used to prevent, reduce and clean up air, water and land pollution. They consist of the actual hardware plus the education, training and information needed to put these technologies to good use in improving our environmental condition.

The United States is the world leader in the development of environmental technologies needed to comply with our tough environmental standards, but unfortunately, we are not the dominant trader of these technologies in the global market. Other countries like Japan and Germany are spending more of their gross national product to help their companies sell their technologies in the global market. We have to do the same if we wish to compete, if we wish to create new jobs for the next century and if we wish to save this planet from further pollution. ...

There is one group that the president failed to mention in his address: the private sector. Unless the private sector is included in the strategic planning process, I fear we will not be able to meet the president's goals of improving U.S. competitiveness. For it is the private sector that has developed these technologies, it is the private sector that will sell these technologies in the global market, and it is the private sector that will create the jobs we so badly need in this country.

According to the Office of Technology Assessment, the global market for environmental technology, goods and services was \$200 billion in 1990. By conservative estimates, it is expected to grow to \$300 billion, or possibly \$500 billion, by the year 2000.

The U.S. share of this market, while substantial, is only a small percentage compared to that of its major trading partners. According to a 1992 report from the Brookings Institution, exports from the 12-nation European Community average more than 30 percent of total GNP. In contrast, U.S. exports account for less than 7 percent of GNP. The reason for this difference: the lack of a coherent trade strategy in the United States compared to our European trading partners. If we create a true public-private partnership in the area of environmental technologies, we can capture a greater share of the world market and create more than 300,000 new jobs in this country at the same time.

This is good news for economically hard-hit regions like New England, where defense cutbacks and base closures are taking a toll on an already depressed regional economy. Yet, New England businesses are not waiting for the government to do something for them. They are starting to form their own organizations to promote exports of green technologies. In Massachusetts, an estimated 1,300 companies employing more than 40,000 people are involved in green

businesses. At least 200 of these companies, along with state agencies and institutions of higher education, such as the University of Massachusetts, have joined forces to establish the Environmental Business Council (EBC) of New England.

The council already has entered into a major agreement with CONCAMIN, an association of industries in Mexico. This is precisely the kind of cooperative arrangement that the United States among other countries pledged to support in Agenda 21, the strategic plan for sustainable development adopted at the 1992 Earth Summit. The EBC-Mexican agreement has already spawned major new contracts for air and water pollution equipment from Massachusetts businesses and more are expected. ...

While the private sector is getting organized, I cannot say the same for the government. At a February 1993 hearing of my Environment and Natural Resources Subcommittee, witnesses testified that the government has no clear leadership, focal point or agenda on this issue. At least 12 agencies have export promotion programs, and none is clearly in charge or has as its mission helping environmental businesses to sell their products overseas.

The National Environmental Trade Development Act of 1993 will put somebody in charge. ... The legislation has four key elements. First, it establishes a joint government-private sector Environmental Trade Promotion Council and calls on the council to develop by April 30, 1994, a national strategy for increasing exports of U.S. environmental technologies, goods and services. The council will be chaired by the secretary of commerce and will include representatives of key agencies with responsibility for export promotion and environmental assistance, as well as representatives of environmental businesses, labor, consumer and conservation groups. ...

A second important component of the bill authorizes matching funds for up to six Regional Environmental Business and Technology Cooperation Centers ... The centers will do what the government alone cannot do: prepare detailed assessments of foreign countries' demands for environmental technologies, provide hands-on assistance to small- and medium-sized environmental companies interested in establishing or expanding their export programs, and bring foreign nationals to the United States for training in U.S. environmental laws, management and technologies.

A third piece of the bill establishes a senior-level Environmental Service Corps within the Peace Corps. The aim is to take advantage of the experience of American businessmen, teachers and environmentalists who want to go abroad and provide technical assistance to developing nations. ...

Lastly, the bill authorizes the secretary of commerce to establish American Business Centers and Environmental Business Centers in nations other than the independent states of the former Soviet Union. The concept of establishing the centers was authorized in last year's Freedom

Support Act, but limited to the former Soviet Union. The centers offer space, facilities and market analysis services to U.S. firms, trade associations and state economic development offices on a user-fee basis; serve as repositories of commercial, legal and technical information, including environmental information; and provide assistance to small-and medium-sized businesses wishing to sell their goods and services to the independent states. ...

# Poetry as Thoroughbred

The following is excerpted from "Reading: Does the Future Even Require It?" an article by James Lichtenberg, vice president and director of the Higher Education Division of the Association of American Publishers. The article appeared in the Winter 1993 edition of Liberal Education, published by the Association of American Colleges. The edition explores "the future of the book in an electronic age." Lichtenberg challenges the notion that technology has made classical education obsolete. He suggests it is society's view of the written text — and its definition of literacy — that may need to change.

hen we speak of reading, we really are speaking on at least two levels: the relationship of an individual to information and a social relationship. For instance, if among a certain cohort of students, reading is not seen as being a part of adult life, or if among another cohort, "book" literacy (as opposed to video, economic or computer literacy) is not seen as being central to their future well-being, why indeed should they be inspired to pursue reading beyond the level of mechanical mastery required for school? ...

We must recognize that there is a question of values here, both normative and practical: What would we like to see among students? What does their future really require?

If we are going to work to send our students down a given path, we must be candid about the extent to which we are operating from the perspective of our personal value judgments, as well as reasonable about what students are going to need to live their lives. It may well be that as the world changes, the role of reading changes as well. ...

Part of the problem we are having with our undergraduates is that they may lack sufficient content knowledge of a common culture to be able to read at levels that seem to characterize the better students of several decades ago. ...

I would argue that cultural fragmentation in the United States is the outcome of four very specific and quite legitimate phenomena that are as influential as any purported zeitgeist, television, advertising or dilution of the high school curriculum. While we may not think of these phenomena as relevant to how we read as individuals, they unquestionably affect reading levels in a sociological context. They are:

— sustained levels of immigration during the last two decades that have brought large numbers of peoples to our shores with radically different cultural backgrounds from those in the earlier waves of European immigration;

— astounding and continuing advances in technology, especially video and computer, that have created powerful alternatives to ink on paper for the transfer of information;

— growing participation in higher education by women and minorities who want to see their cultural perspectives reflected in what students learn and what we as a culture consider "important;" and

— the explosion of knowledge in so many directions that experts are unable to stay on top of their fields. In many professions, a book is *ipso facto* out of date and various forms of on-line or unpublished communications are the only reliable sources of information.

In the face of these four forces, our cultural fabric is stretched, if not tearing. It is not surprising that even among liberal arts undergraduates, reading ability is affected. ...

With access to comprehensive forms of information, whether written, visual or aural — thanks to the magical powers of digitized information that provide us with actual music and sounds, photographs, manipulable reproductions of art and photography that allow us to zoom in and out on details — the very concept of "literate" takes on a whole new meaning. ...

In light of this kind of time and space travel, if we are concerned about developing a meaningful literacy for young people, then it seems a return to neoclassical protocols of the 1950s, however comforting, is simply irrelevant. This is not to say that language may not always be a primary — if not *the* primary — vehicle for information, or that poetry may not always remain the single most concentrated form of communication among human beings. Written language, however, was not always seen as a universal good. Plato, after all, was quite distressed at the rise of the written word. He believed it would destroy our ability and taste for oral memory — which it did.

Reading is only one means of acquiring information. If we understand it as such, we may do a better job of teaching the deeper aspects of it.

To draw an analogy with transportation: As the 20th century unfolded, the use of horses to transport materials disappeared almost completely in the industrialized world. Horses themselves didn't disappear, however, and we still ride them and race them for personal pleasure. In the future, fiction, poetry, creative essays and biographies may be our thoroughbreds; the bulk of information transfer will be accomplished by other means. ...

### FALL RIVER, MASS. —

Bristol Community College signed a dual admissions agreement with the University of Massachusetts at Dartmouth to make it easier for community college students to transfer to the four-year university. Under the agreement, students in associate degree programs at BCC will be automatically admitted to UMass-Dartmouth for bachelor's degree study as long as they maintain a 2.5 cumulative grade average.

### HANOVER, N.H. —

Dartmouth College, New England Telephone and NYNEX began collaborating on a three-year project to develop an educational network linking campus facilities to area schools, libraries and museums. Educators and students will use the network to communicate by voice and video and retrieve video, image or text resources from others on the network.

### CAMBRIDGE, MASS. —

Harvard Law School received \$5 million from Saudi Arabia's King Fahd to establish a campus center for Islamic law study, including an endowed professorship to be designated "The Custodian of the Two Holy Mosques" chair.

### BRUNSWICK, MAINE -

Bowdoin College was awarded \$38,000 by the National Science Foundation for research on legal disputes between businesses, which have increased substantially in recent years. The project brings together faculty researchers from the college's psychology, law and economics departments.

### NEW HAVEN, CONN. —

The Pew Charitable Trusts awarded Yale University \$1.5 million to establish a program on the role of religion in American history.

### LOWELL, MASS. —

The University of Massachusetts at Lowell reached an agreement with Middlesex Community College and Northern Essex Community College to allow nursing students to more easily transfer credits from an associate degree in nursing toward a bachelor's degree in nursing at UMass-Lowell.

### STORRS, CONN. —

The University of Connecticut announced it will admit freshmen into its business school for the first time, starting in September 1993. Under the new policy, freshman applicants can enroll in the School of Business Administration if their academic skills place them in the top 20 percent of the previous year's UConn freshman class. Currently, students interested in studying business at UConn spend their first two years as pre-business majors in the College of Liberal Arts and Sciences, and apply for admission to the business school at the end of sophomore year.

### WALTHAM, MASS. —

A group of faculty and students from Brandeis University's Peace Studies Program voted to change the program's name to Conflict and Peace Studies and shift the interdisciplinary focus from superpower conflicts in the nuclear age to the resurgence of ethnic hostilities around the world.

### WEST HARTFORD, CONN. —

United Technologies Corp. awarded a five-year, \$275,000 grant to Saint Joseph College to outfit a new science education and physics laboratory and renovate the college's science lecture halls.

### SOUTH HADLEY, MASS. —

A Mount Holyoke College anthropologist received \$1.3

million from the Andrew W. Mellon Foundation and The Pew Charitable Trusts to modernize the library systems of the Czech and Slovak republics in the former Czechoslovakia. The library, housing one of Europe's oldest collections, has suffered from 40 years of neglect under communist rule, and the collections have never been cataloged or preserved on microfilm.

### KEENE, N.H. —

Keene State College was awarded \$20,080 under the National Science Foundation's Instrumentation and Laboratory Improvement program to establish a laboratory for remote sensing and a geographic information system.

### NEW HAVEN, CONN. —

Yale University's Peabody Museum opened an exhibit entitled "Dinosaur Vision: Science and Fiction in Jurassic Park," complete with moving, robotic dinosaurs similar to the ones used in Steven Spielberg's blockbuster movie.

### CHICOPEE, MASS. —

Springfield-based Massachusetts Mutual Life Insurance Co. awarded \$50,000 to Elms College for a scholarship program to aid continuing-education students.

### PROVIDENCE, R.I. —

Johnson & Wales University provided special retraining for more than 60 foodservice employees from Harvard University. The Harvard cooks had difficulty keeping up with recently expanded menus at 13 campus dining halls.

### LOWELL, MASS. —

Environmentalist and former presidential candidate Barry Commoner joined the faculty of the College of Engineering at the University of Massachusetts at Lowell as a visiting professor. He will work with university officials to develop environmentally sound new technologies and pollution-preventing industrial production systems.

### STORRS, CONN. —

University of Connecticut scientists were awarded \$150,000 by NASA to continue work on special X-ray testing of new engine materials for high-speed aircraft. The tests may help NASA develop high-speed civilian transport planes.

### HANOVER, N.H. —

Dartmouth College's women's softball team complained to the U.S. Department of Education that Dartmouth's failure to upgrade the program to a varsity sport amounts to violation of Title IX of the Education Amendments of 1972, which require equal athletic opportunities for men and women in college sports.

### CAMBRIDGE, MASS. —

Harvard University was awarded \$25 million by the Walter H. Annenberg Foundation to support undergraduate student scholarships, undergraduate seminars and restoration of the Great Hall in the university's Victorian-style Memorial Hall.

### HARTFORD, CONN. —

The University of Connecticut and the Hartford Graduate Center, which is affiliated with Rensselaer Polytechnic Institute, agreed to collaborate on graduate and professional programs in business, engineering and public administration. Among other things, the initiative will allow students in certain engineering programs to cross-register. The collaboration also includes a series of jointly sponsored conferences on issues facing Connecticut.

### BEVERLY, MASS. —

Endicott College launched a new associate degree program to prepare students to work as assistants to licensed physical therapists. The program is being offered in affiliation with Beverly, Malden and Addison Gilbert hospitals.

### CAMBRIDGE, MASS. —

The Massachusetts Institute of Technology's Japan Program introduced a summer intensive course on technical Japanese for materials science and related engineering. The course is designed for scientists and engineers who already speak and read Japanese but need to access technological developments increasingly available only in Japanese-language publications.

### AMHERST, MASS. —

The Hewlett-Packard Co. awarded \$51,585 to Amherst College to buy equipment for its chemistry department.

### NEW HAVEN, CONN. --

Yale University's School of Medicine was awarded a \$25,000 challenge grant from The Carolyn Foundation for its mobile medical community outreach program, which provides free primary medical treatment to some of the estimated 6,000 homeless people in New Haven.

### WALTHAM, MASS. —

Two women's studies professors at Brandeis University formed a nationwide consortium in graduate women's studies. Based at Radcliffe College, the consortium joins Brandeis with Boston College, the Massachusetts Institute of Technology and Harvard, Northeastern and Tufts universities.

### DURHAM, N.H. —

A University of New Hampshire scientist discovered a way to dramatically increase the yield and value of certain crops. The UNH plant biologist found that using "high tunnels" — greenhouse-like structures that use no mechanical ventilation or heating systems to protect plants from the elements — could increase a one-acre yield of tomatoes from 18,000 pounds to 34,000 pounds, upping its net value from \$9,500 to \$24,000.

### LOWELL, MASS. -

The University of Massachusetts at Lowell and the other UMass campuses at Amherst, Dartmouth and Boston, were awarded \$1.2 million from the National Science Foundation to update physics teaching methods for public high school teachers across the state.

### PROVIDENCE, R.I. —

The Andrew W. Mellon Foundation awarded Brown University a four-year, \$200,000 grant to encourage minority students to pursue doctorates in arts and sciences fields in which they are underrepresented. Under the "Mellon scholars" program, five minority sophomores will be chosen each year to participate in academic projects with faculty mentors and advisors. The scholars will also receive financial assistance toward graduate school. A similar Mellon Foundation grant was awarded to Bowdoin College.

### MEDFORD, MASS. —

Raytheon Co. and its subsidiary, the Badger Co., contributed \$320,000 to establish a professorship of pollution prevention at Tufts University's College of Engineering.

### LEE, N.H. —

The School for Lifelong Learning introduced a certificate in adult learning and development for instructors of adult students.

### AMHERST, MASS. —

The founder of Dairy Mart donated \$1 million to the University of Massachusetts at Amherst to support the study of business leadership at the School of Management. Charles Nirenberg, a UMass alum, started the convenience store chain with a single store in Springfield, Mass., in 1957. Today, the Enfield, Conn.-based chain is the third largest in the country.

### FAIRFIELD, CONN. —

Fairfield University and Doshisha Women's College of Kyoto, Japan, agreed to create a two-year exchange program that will begin in fall 1993, when two Japanese students attend Fairfield.

### KINGSTON, R.I. —

The U.S. Naval Research Laboratory awarded University of Rhode Island researchers \$928,000 to develop ways to detect mines in seabed environments. The URI research is part of a five-year, national project.

### STORRS, CONN. —

The University of Connecticut began publishing *The Connecticut Economy: A University of Connecticut Quarterly Review*, reporting on employment, prices and consumer confidence, as well as less common economic indicators such as traffic volume on Connecticut roads. The publication is sponsored by a group of Connecticut businesses and public agencies.

### WALTHAM, MASS. —

A team of researchers from Brandeis University's Center for Human Resources began a three-year study of Serve-America, a community service program involving more than 100,000 public school students across the nation. University officials say the study could help the Clinton administration create a national service policy.

### NORTON, MASS. —

Wheaton College was awarded \$500,000 by the Shelby Cullom Davis Foundation of New York to endow a visiting professorship in Russian studies. The endowment will support annual one-semester appointments.

### DURHAM, N.H. —

The University of New Hampshire received a \$500,000 seed grant from the Gruber Foundation to open a new manufacturing management center in Manchester's Amoskeag Millyard. The Manchester Manufacturing Management Center will offer manufacturers a single resource for information about manufacturing practices and strategies.

### PROVIDENCE, R.I. —

The National Science Foundation awarded \$3.8 million to Brown University, Hampshire College and the Brown-based Coalition for Essential Schools for a four-year project to help high school teachers integrate math and science classes and move away from rote drills and memorization. Over the course of the project, 96 math and science teachers selected from high schools affiliated with the Coalition's national curriculum restructuring effort will receive advanced training at Brown and Hampshire in math, science and new ways of teaching.

### WORCESTER, MASS. —

The University of Massachusetts Medical Center at Worcester unveiled a new program, linking UMass faculty members with school teachers in an effort to improve science literacy in grades K-12. Within two years, the medical center plans to offer the program to half of Worcester's elementary and middle schools and create satellite programs in school systems throughout central Massachusetts.

### WELLESLEY, MASS. —

Wellesley College reported that applications for the class of 1997 jumped 15 percent over last year's figure, thanks in part to the "Hillary factor." Activist First Lady Hillary Rodham Clinton graduated from the women's college in 1969.

### MIDDLEBURY, VT. —

Middlebury College unveiled an overhauled undergraduate curriculum with a new set of course requirements. Beginning with the class of 1998, all students will be required to take at least one course from seven out of eight specified areas: literature, the arts, philosophical and religious studies, physical and life sciences, deductive reasoning and analytical process, social analysis, and foreign language. Students will also be required to study the cultures of the United States,

Europe and any other non-European nation or region.

### STORRS, CONN. —

The Hartford Courant announced it would "lend" two top staffers to the University of Connecticut journalism department in fall 1993. The department, with its four full-time faculty members, has seen an 80 percent jump in enrollment over the past six years. In exchange for their services, the Courant staffers will be allowed to take two courses of their choice.

### AMHERST, MASS. —

Five Colleges Inc., a consortium of western Massachusetts higher education institutions, was awarded \$400,000 from the Andrew W. Mellon Foundation to develop solutions to administrative issues such as: adapting to

advancements in communications technology; cost containment in risk management, health care and student lending; environmentally sound campus waste disposal; and increased campus-based career services. The consortium, which consists of Hampshire, Amherst, Smith and Mount Holyoke colleges and the University of Massachusetts at Amherst, plans to use the money to promote collaborative efforts that could be used as models by other institutions.

### PROVIDENCE, R.I. —

Johnson & Wales University announced it would begin offering a bachelor's degree in culinary arts in September 1993. University officials said it's the first degree of its kind in the country. Culinary schools typically offer only one- or two-year programs. The program will stress practical training in food preparation and management skills, and include six months of cooperative education.

### WEST HARTFORD, CONN. —

The University of Hartford's Biomechanics Research Institute was awarded \$88,000 by Connecticut's Department of Economic Development for its research on artificial hip implants. The research is part of a collaborative effort with the University of Connecticut Health Center. According to researchers, up to 20 percent of the 60,000 uncemented hip implant operations performed yearly in the United States fail.

### BOSTON, MASS. —

Boston College's Graduate School of Nursing and Carroll Graduate School of Management launched a dual-degree program to prepare executive nurses for the

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### RANDOLPH CENTER, VT. —

Vermont Technical College announced it will offer a bachelor's degree program in architectural engineering technology, starting in fall 1993. It will be the first bachelor's-level program offered by the college.

### CAMBRIDGE, MASS. —

Harvard University was awarded a \$2 million grant by the V. Kann Rasmussen Foundation to support its interdisciplinary program in environmental studies.

### NEW HAVEN, CONN. —

Yale University officials announced that the amount of trash the university hauls to the city's landfill dropped by 25 percent between 1988 and 1992, as a result of increased recycling activity. Yale's university-wide recycling program began in 1990. Almost 480 tons of cans, bottles, newspapers, office paper and corrugated cardboard were collected for recycling in 1992.

### MIDDLEBURY, VT. —

Middlebury College surveyed about 2,000 parents of students to determine their satisfaction with issues such as academic affairs, student affairs, residential life, co-curricular activities and parents services. Preliminary reports revealed the highest marks went to athletics

and the quality of teaching. Parents were less satisfied, however, with residence halls, dining services and career counseling.

### STORRS, CONN. —

The University of Connecticut was awarded \$594,000 by the National Science Foundation to improve calculus education in high schools across the state.

UConn officials note that more than half the students who enroll in college calculus drop out.

### DURHAM, N.H. —

The University of New Hampshire was awarded \$189,000 by the federal government to take part in a U.S.-Canadian effort to keep harbor porpoises out of fishing nets through the use of underwater acoustics.

### BRUNSWICK, MAINE —

The National Science Foundation awarded \$125,000 to a Bowdoin College team developing interactive three-dimensional animation to assist in teaching biology to high school students and college freshmen.

### KEENE, N.H. —

The U.S. Department of Education awarded a five-year, \$1 million grant to Keene State College to support its Aspire Program, which provides special services for disabled, low-income and first-generation students. Among the services offered by the program: academic advising, tutoring, counseling, career planning and advocacy. More than 1,000 students have been served by the program since it was established in 1980.

### WINDHAM, N.H. —

Castle College announced it would expand its certificate program in early childhood education to the two-year, associate degree level, beginning in fall 1993.

### FAIRFIELD, CONN. —

Fairfield University received \$90,000 from the Henry Luce Foundation to create two-year scholarships aimed at encouraging women to enter science fields. University officials report that the number of women enrolled in science majors at Fairfield tripled over the past four years to 291.

### NEWPORT, R.I. —

The William Randolph Hearst Foundation awarded \$25,000 to Salve Regina University for its scholarship fund for minority students. The university's minority student fund was begun with Hearst Foundation donations in 1987 and has so far awarded scholarships to approximately 12 students.

### WEST HAVEN, CONN. —

The University of New Haven was granted permission and accreditation to begin offering a bachelor's degree in medical technology. The new program will qualify graduates to begin careers as laboratory practitioners or pursue advanced study in public health, epidemiology or health care management.

### CHICOPEE, MASS. —

Elms College received a National Science Foundation grant of \$74,731 for faculty research into thyroid deficiencies that may contribute to jet lag, sleep disorders and seasonal affective disorders.

### KEENE, N.H. —

Antioch New England Graduate School announced it would introduce a doctoral program in environmental studies, beginning in summer 1995. College officials say the program will be introduced based on the increased popularity of Antioch's master's-level environmental program.

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### PROVIDENCE, R.I. —

The Davis Educational Foundation awarded a three-year, \$600,000 grant to Brown University to help complete an electronic library catalog, which will contain more than 6 million items.

### WEST HARTFORD, CONN. —

The University of Hartford's College of Engineering was awarded \$803,000 by the Society of Manufacturing Engineers for equipment and software to enhance the college's graduate education in manufacturing engineering.

### FAIRFIELD, CONN. —

Fairfield University's School of Nursing received \$79,600 from the Helene Fuld Health Trust to upgrade computers and other technical equipment in two nursing laboratories on campus.

### DURHAM, N.H. —

A University of New Hampshire scientist received a three-year, \$180,000 grant from the U.S.
Department of Agriculture to study the genetic makeup of strawberries and help breeders develop bigger, sweeter, more disease-resistant and pest-resistant berries.

### SPRINGFIELD, MASS. —

Springfield Technical Community College was awarded \$53,255 by the National Science Foundation toward a new optical test and measurement laboratory, with state-of-the-art equipment to determine the quality of precision optical components used in microscopes and other instruments. Officials said the acquisition would enable the college to add an associate degree in optical fabrication and testing to its Laser Electro-

Optics Technology program, beginning in September 1994.

### WATERBURY, CONN. —

Naugatuck Valley Community-Technical College was awarded a \$187,000 Yankee Ingenuity Initiative grant by Connecticut's Department of Economic Development to establish an Alternative Fuel Vehicle Technology Center, as part of the state's effort to comply with the federal 1990 Clean Air Act. Connecticut officials said the Naugatuck grant will be matched by a grant from the technical education fund established by the Board of Trustees of the Community-Technical Colleges of Connecticut.

### CAMBRIDGE, MASS. —

Harvard Medical School received \$20 million — the largest single donation in its history — from the Warren Alpert Foundation for a new medical research building, which will be named after Alpert, a 1947 graduate of the Harvard Business School, whose Warren Companies is one of the country's 400 largest privately held companies.

### MIDDLETOWN, CONN.. —

Middlesex Community-Technical College received a \$31,400 Yankee Ingenuity Initiative grant from Connecticut's Department of Economic Development, and almost \$200,000 in equipment and materials support from local businesses for its Opthalmic Design and Dispensing Program. The program teaches students lens crafting skills for today's optical retail businesses as well as precision optical manufacturing required by the aerospace industry.

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