

# CONNECTION

NEW ENGLAND'S JOURNAL  
OF HIGHER EDUCATION AND ECONOMIC DEVELOPMENT  
VOLUME IX, NUMBER 4

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## Taking Stock

1955 *to* 1995

The Boston Globe  
Gunsmen Kill 4 Students in Ohio  
India Spurs Campus Upheaval

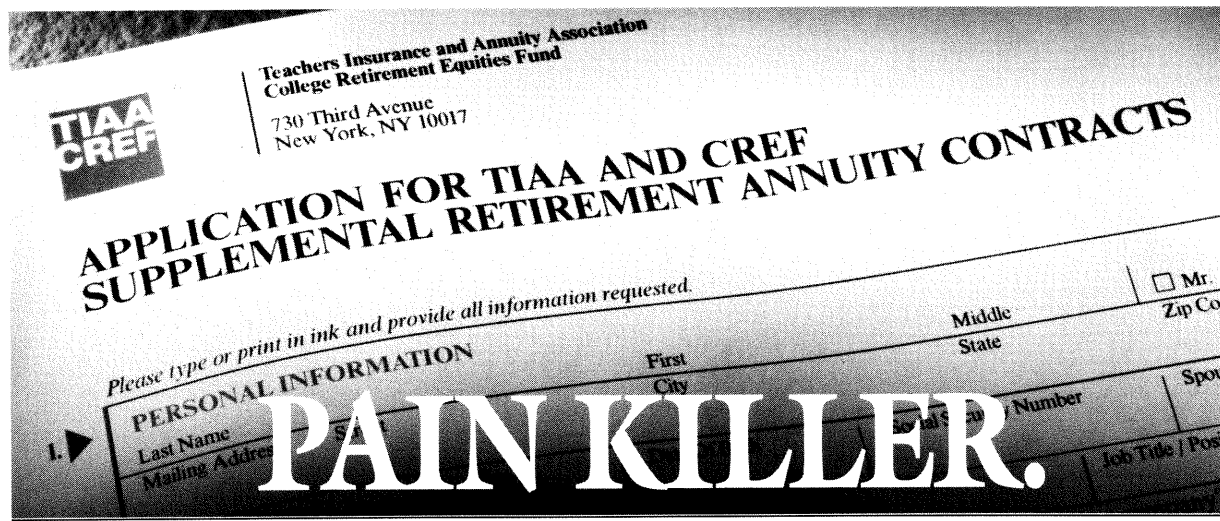
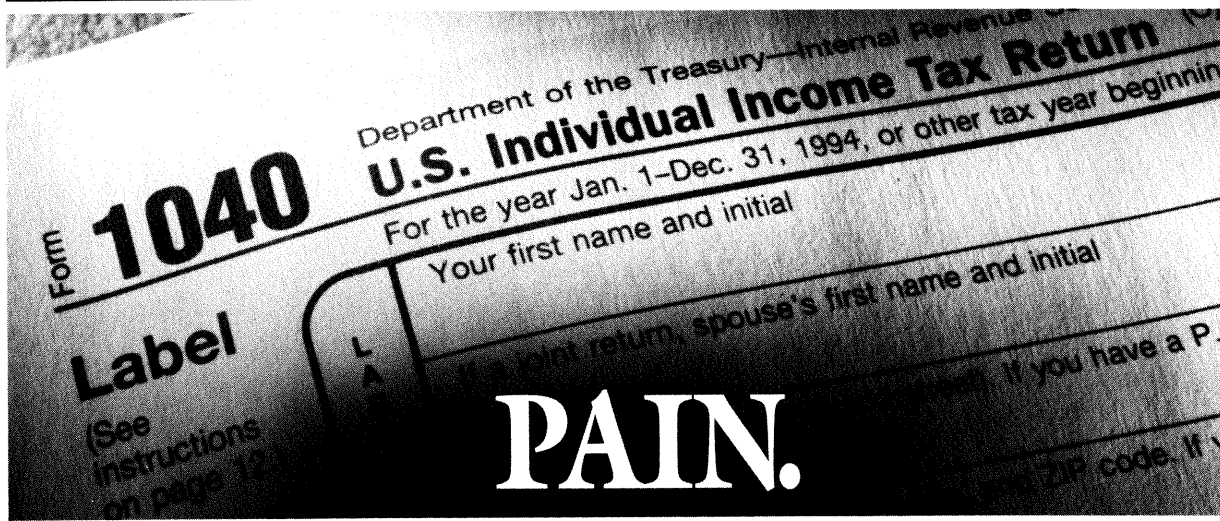
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# CONNECTION

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OF HIGHER EDUCATION AND ECONOMIC DEVELOPMENT

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The New England Board of Higher Education is a nonprofit, congressionally authorized, interstate agency whose mission is to foster cooperation and the efficient use of resources among New England's approximately 260 colleges and universities. NEBHE was established by the New England Higher Education Compact, a 1955 agreement among the states of Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island and Vermont.

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## E D I T O R ' S M E M O

If, as Tom Wolfe once observed, "The present we know is only a movie of the past," pass the popcorn. Today's feature presentation, co-directed by parallel events in New England higher education and economic development over the past 40 years, is at once epic triumph, sci-fi thriller and tormenting character study of a region haunted by old ghosts.

The triumph first. Despite the democratizing effects of the G.I. Bill, higher education still served a small elite in 1955. In New England, about 190 colleges and universities, mostly four-year institutions, enrolled approximately 180,000 students, mostly males between ages 18 and 24. Today, nearly 260 New England colleges and universities, including 45 publicly supported community and technical colleges, enroll more than 825,000 students, more than half of them women, nearly half of them part-time, and 35,000 of them foreign students drawn to the region by its world-renowned higher education offerings.

New England university research — dominated by military research in the aftermath of the Soviet Union's launch of Sputnik in 1957 — has dramatically pushed the frontiers of medicine, biotechnology, computer science, environmental technology and telecommunications. And interstate cooperation has found a place in fiercely independent New England, thanks in part to the prescient programs of the New England Board of Higher Education, whose 40th anniversary precipitates this look back — and forward.

But the ghosts keep popping up. Forty years after the U.S. Supreme Court ordered "all deliberate speed" in the integration of public schools and 20 years after the Boston School Committee plunged the city into a bitter battle over court-ordered desegregation, minorities remain underrepresented on New England college campuses, African-American and Jewish students in progressive Newton, Mass., are being harassed by young racists, and crackpot academics from such venerable institutions as Harvard and Wellesley preach bigotry to large audiences.

Thirty years after President Johnson signed laws creating major student financial aid programs, as well as the National Foundation for the Arts and National Foundation for the Humanities, the "Contract with America" dangles a noose over these programs.

About 25 years after Massachusetts engineers working on the ARPAnet computer network mixed the asphalt for the much talked about Information Superhighway, a lack of regional planning has raised the specter of advanced telecommunications missing New England just as surely as the opening of the St. Lawrence Seaway in 1959 caused ocean vessels to bypass the region's seaports.

In conjunction with NEBHE's 40th anniversary, this special issue of CONNECTION begins to take stock of higher education, economic development and interstate cooperation during the period 1955-1995. From an editorial standpoint, a timeline was a natural choice to mark such an occasion. We think you'll find ours to be unique in conveying the rich history of New England's higher education-economic development nexus — as full of plot twists as it is. Most importantly, we trust that, amid all the reflection, our distinguished commentators have also provided a framework for future progress, for the present we know is not *only* a movie of the past. It is also coming attractions.

*John O. Harney is the editor of CONNECTION.*



## Going the Distance

The New England Board of Higher Education conducted its first study of distance learning back in the days when Americans dialed black telephones and watched black and white TV sets. In 1959, the focus was on two of the nation's pioneering "educational television" stations — WENH at the University of New Hampshire and WGBH in Boston. Then in 1983, when the closest thing to an "Information Superhighway" was Route 128, the board issued a sobering report on the region's progress in distance learning, noting that of 70 outstanding instructional telecommunications programs nationwide, not one emanated from New England. "There may be no other major aspect of academic endeavor in which this level of New England inadequacy could occur," the report lamented.

In January, NEBHE received a two-year, \$125,000 grant from the AT&T Foundation toward its most comprehensive assessment of distance learning to date. The grant will support the work of NEBHE's Regional Commission on Telecommunications and Distance Learning, established last year to examine ways the six New England states and the region's colleges and universities can collaborate to develop and coordinate top-notch telecommunications and distance learning programs.

Because distance learning will expand rapidly across state boundaries, cooperation will be critical. Says NEBHE Senior Fellow Edmund T. Cranch, the director of the project, "Traditional educational institutions will have to modify their go-it-alone mentality and be willing to share programming in a collaborative manner."

## Hurry, Hurry

*Extra credit* isn't what it used to be. Some legislators and higher education administrators — wary of college students taking six or more years to earn bachelor's degrees — are trying to discourage "excessive credit accumulation" as a way to reduce the cost of a college education and send students into the job market sooner.

In one of the most aggressive policies, the University of North Carolina levies a hefty tuition surcharge on students who

take more than 140 credits to complete a bachelor's degree, which normally requires 120 credit hours.

Pinching credits is not the only way to shorten "time to degree." Some states are weighing steps to discourage students from taking *fewer* credits than required for graduation in four years, thus extending their stay on campus. States and institutions also are using advanced placement, summer school, distance learning and "compressed semesters."

In New England, Albertus Magnus College offers a tri-session program leading to a bachelor's degree in three years. Middlebury College has launched a three-year "International Major," featuring intensive language study and a year abroad. And under a Massachusetts dual-enrollment program, the state pays for qualified high school juniors and seniors to take certain courses for credit at public colleges.

Some educators aren't so sure about paring down the educational experience. If anything, they contend, today's students need *more* education and remedial courses. In addition, one less year of paying tuition would not eliminate the need for most students to work to pay for college. There is another concern: As former Bradford College President Arthur Levine, now president of Columbia University's Teachers College, put it in *The Wall Street Journal*, "Eliminating the final year of college would be a financial disaster for most institutions, which are heavily dependent on tuition or enrollments to fund their operations."

## Defense Rests?

Efforts to ease defense-dependent economies into civilian life are under fire from conservative columnists and Republican congressional leaders who don't want defense funds spent for nondefense purposes.

In February, the U.S. House Appropriations Committee voted to slash \$537 million allocated for defense conversion projects in the current fiscal year, including \$502 million from the Technology Reinvestment Project (TRP), a Clinton administration creation to promote collaboration among business, government and higher education in developing tech-

nologies that meet both commercial and defense needs.

New England projects funded through the TRP have included a joint initiative by the University of Massachusetts at Lowell, Worcester Polytechnic Institute and the Massachusetts Biotechnology Research Institute to retrain defense-industry engineers and manufacturing specialists for jobs in biotech, and a Tufts University program to retrain defense-industry electrical engineers and systems designers.

The Appropriations Committee's plan would also rescind \$150 million for environmental programs at U.S. military bases. Among Pentagon-funded environmental initiatives in New England: The University of Rhode Island was awarded \$1.3 million to establish an environmental research and training center at the former U.S. Navy site at Davisville-Quonset Point, and the University of Massachusetts at Amherst received \$1.3 million to train people in hazardous waste cleanup at Fort Devens in Ayer, Mass.

California Rep. George E. Brown, Jr., the ranking Democrat on the House Science Committee, called the appropriations bill "an early storm warning of the dismal future of federal support for research and development." That would be a hurricane in New England, where 68 cents of every dollar spent on university research comes from Washington, and defense funds account for a plump 11 percent of federal obligations to colleges and universities.

## The Other White Meat

Politicians and commentators love to rail against *earmarks* — those special appropriations for university research inserted into bills by senior members of congressional committees without peer review. But university officials increasingly defend the so-called pork-barrel projects without embarrassment.

In September, Boston University President John Silber told a congressional committee that BU has sought earmarked funds for certain research facilities because research in some fields crucial to U.S. competitiveness simply is not funded under more traditional peer-reviewed



programs. Silber cited photonics, noting that while the practical use of light has crucial applications from laser surgery to compact discs, no government agency funds large-scale photonics projects. So BU approached lawmakers directly and received \$29 million in federal funds for its Center for Photonics. Silber observed further that the research facilities BU has built with earmarked funds help the university compete for peer-reviewed research grants.

### Rolling the Dice

The economic power of the Foxwoods Resort and Casino in Ledyard, Conn., is becoming clear. A panel of New England economists recently attributed Connecticut's modest 1994 job growth, in part, to the success of the casino operated by the Mashantucket Pequot Indians of Ledyard. And an official of the Business & Industry Services Network of the Community-Technical Colleges of Connecticut told the colleges' trustees that while tough economic times had caused large companies such as Pratt & Whitney, Travelers Corp. and Aetna Life & Casualty Co., to cut back on customized training contracts through the network, healthier clients have emerged. Among them: Foxwoods. The casino has sent hundreds of workers through network programs in accounting, business and travel and tourism.

### Mass. Bonding

Now, every New England state offers a tax-favored college savings bond program. Massachusetts was the only hold-out, and that changed in January after four years of on-and-off debate.

Under the state's new "U. Plan," families buy certificates that can be used later to pay a set percentage of tuition at 67 participating colleges and universities. The tuition certificates will increase in value over time to cover the same portion of tuition upon redemption that they would now. For example, a family that buys a \$2,000 certificate this year and later sends a child to a participating institution whose tuition today is \$10,000, could use the certificate to cover 20 percent of tuition for one year, regardless of the tuition rate at the time.

Plan backers note that the state's pledge

to pay colleges and universities for the original value of the bonds, plus interest equal to inflation, plus two percentage points compounded annually, presents participating institutions with a compelling incentive to keep a lid on tuition costs. Twenty-eight public institutions and 39 private institutions, including Boston and Northeastern universities and Amherst, Smith and Wellesley colleges, are assuming the risk. Some private institutions, including Harvard, Brandeis and Tufts universities and the Massachusetts Institute of Technology, opted not to take part.

Rhode Island and Connecticut adopted college savings bond programs in 1988. New Hampshire and Vermont followed suit within two years, and Maine did so in 1992.

The Massachusetts plan is unique in that investors may pay as little as \$25 a month to buy certificates, and the program is open to all U.S. citizens, not just state residents. There's a viable national market: Already, 30 percent of first-time freshmen in Massachusetts hail from out of state.

### Looking for Clout

Regionalists have long argued that a regional presidential primary would give the six New England states a stronger voice in national elections. In February, the secretaries of state of Connecticut, Maine, Massachusetts, Rhode Island and Vermont agreed to push leaders in their states to arrive at a single date for 1996 primaries — probably March 12, the all-important Super Tuesday. Massachusetts, Rhode Island and six southern states are already scheduled to hold primaries that day. But Connecticut's primaries were slated for March 26, under the shadow of California's. Maine and Vermont planned to host caucuses on March 5.

Don't expect an *all* New England primary day any time soon. New Hampshire has closely guarded its first-in-the-nation primary status and plans to kick off the 1996 election season on Feb. 20.

### Politics make Fellows

Former Rhode Island Gov. Bruce Sundlun is the newest emigre from the corner office to the campus. The University of Rhode Island's first "Governor in

Residence" will edit his personal and professional papers at URI and serve as inaugural chair of the Forum for Emerging Issues and Public Affairs, a nonpartisan think tank.

The road between New England's statehouses and the region's campuses is well-traveled. Former Vermont Gov. Thomas Salmon is president of the University of Vermont. Former Maine Gov. Kenneth Curtis is president of Maine Maritime Academy. Former New Hampshire Gov. Walter Peterson will retire from the presidency of Franklin Pierce College at the end of this academic year. Former Massachusetts Gov. Michael Dukakis is a political science professor at Northeastern University. And former Vermont Gov. Madeleine Kunin served at Dartmouth and Radcliffe colleges before going on to Washington to become deputy secretary of education.

### Lobster by the Sound

It's a weary lobsterman's dream. University of New Hampshire zoologists Winsor Watson and Hunt Howell have tagged about 10,000 lobsters in New Hampshire's Great Bay estuary and even fitted a few with sonar transmitters in an effort to gather information about the size of the lobster population, where they live and when they're most active.

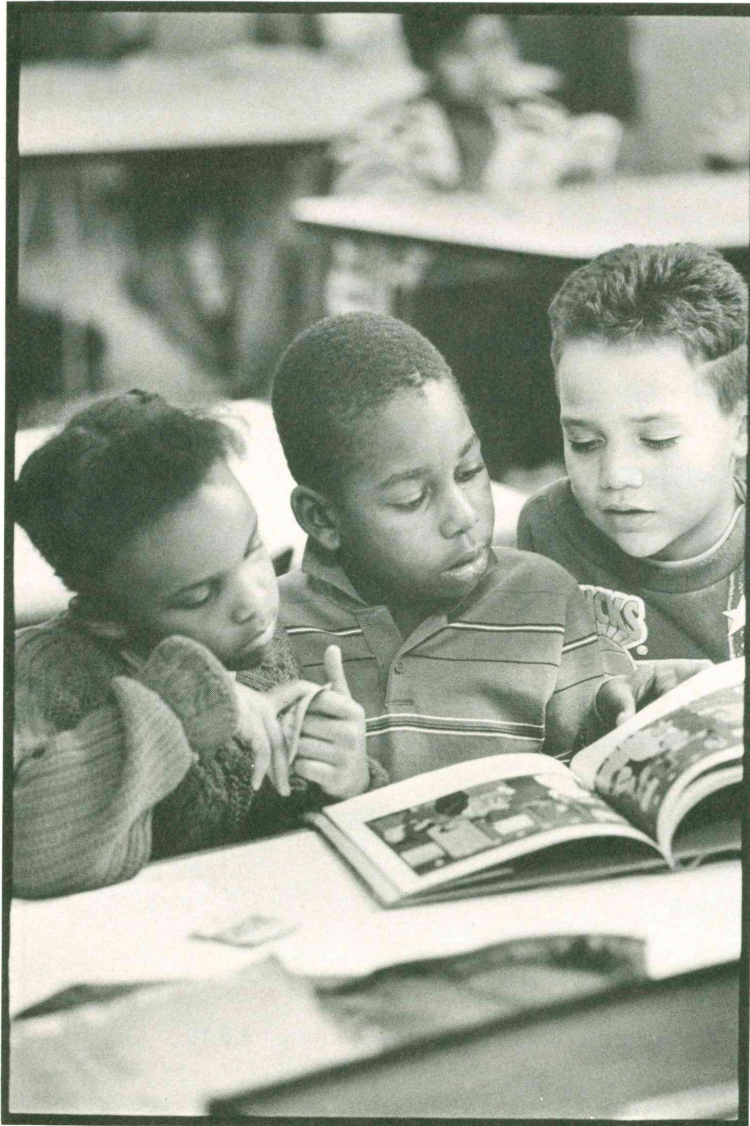
Working with UNH's Coastal Marine Laboratory in Newcastle and Jackson Estuarine Laboratory in Durham, the researchers are using an automated monitoring device to examine how the delectable crustaceans behave in and around traps. Equipped with a computer, videocassette recorder, lights and an infrared camera, the device — built by UNH students — helps the researchers assess the efficiency of the traps and better estimate the lobster population. The research may boost a lobster industry already worth \$143 million annually to New England.

But the high-tech trap can be a little tricky. "The first time we used it, we put it down and the thing immediately filled up with crabs," says Watson. "By the time we got a lobster in there, the batteries were dead and all the computer memory was filled up with crab data."



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TO GO TO COLLEGE.

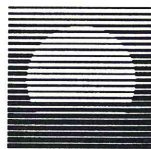
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- Women as a percentage of Harvard Medical School graduates in 1955: **7%**
- Women as a percentage of Harvard Medical School's Class of 1998: **52%**
- Number of New England colleges with "Junior" in their names in 1955: **18**
- Number today: **0**
- Share of average U.S. college costs covered by maximum Pell Grant in 1976: **44%**
- Share covered this academic year: **21%**
- Tuition and mandatory fees at the University of Massachusetts at Amherst as a percentage of median family income in Massachusetts, 1979: **5%**
- In 1993: **12%**
- Tuition dollars saved by New England students through NEBHE's Regional Student Program in academic year 1981-82: **\$7,398,047**
- In academic year 1993-94: **\$24,754,389**
- State appropriations to higher education as a percentage of state revenues nationally in 1980: **11.3%**
- In 1992: **9.2%**
- National increase in state appropriations for higher education, fiscal 1994 to fiscal 1995: **4%**
- National increase in state appropriations for corrections: **8%**
- Estimated number of U.S. children whose mother or father is in prison: **1,500,000**
- Number of New England farms with dairy cattle in 1979: **9,660**
- Number in 1994: **4,840**
- Exports as a percentage of New England gross state product in 1987: **5%**
- In 1993: **7%**
- Exports as a percentage of Vermont gross state product in 1987: **8%**
- In 1993: **22%**
- Exports to Canada as a share of all U.S. exports, 1991-93: **21%**
- As a share of all New England exports: **30%**
- Percentage of 1994 New England gubernatorial candidates who earned undergraduate degrees at private colleges or universities: **71%**
- Number of *Forbes* 200 Best Small Companies in America whose CEOs earned one or more college degrees in New England: **33**
- Number of women who have appeared on U.S. postage stamps: **65**
- Number of those women who attended Mount Holyoke College: **5**
- Women as a percentage of all U.S. state legislators: **21%**
- Women as a percentage of New England state legislators: **28%**
- U.S. rank of New Hampshire, Vermont and Maine, respectively, in percentage of state legislators who are women: **4,6,10**
- Percentage of Dartmouth students who attributed missing class to alcohol use: **36%**
- Percentage of 1994 freshmen at Tufts University who expect to work part-time while in school: **57%**

**Sources:** 1,2 Harvard Medical School; 3,4 New England Board of Higher Education; 5,6 American Council on Education; 7,8 University of Massachusetts; 9,10 New England Board of Higher Education; 11,12 American Council on Education; 13,14 National Council of State Legislatures; 15 *The Nation*; 16,17 Tufts University School of Veterinary Medicine; 18,19,20,21,22,23 Federal Reserve Bank of Boston; 24 NEBHE analysis of *Chronicle of Higher Education* data; 25 NEBHE analysis of *Forbes* data; 26,27 Mount Holyoke College; 28,29,30 Rutgers University Eagleton Institute of Politics; 31 Dartmouth College; 32 Tufts University





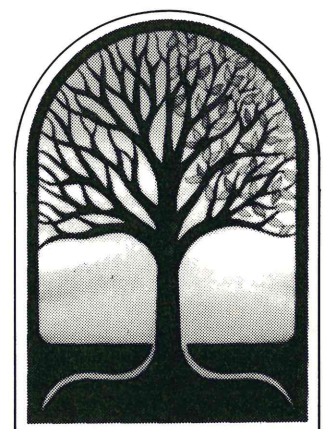
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# Taking Stock: Higher Education and New England's Knowledge-Intensive Economy

JOHN C. HOY

**A**s the New England Board of Higher Education marks its 40th year of service to the region, and the bruises of the most severe recession since World War II begin to heal, it is an opportune time to take stock of higher education and the region's knowledge-intensive economy.

We begin with the fact that New England has more smoothly shifted from a traditional manufacturing-based economy to an advanced technology, high-service economy than any other region in the industrialized world.

We also acknowledge that economic "miracles" don't really happen. New England's ability to adapt, create and grow is the result of tough lessons taught by overlapping periods of wartime vitality (1939-1945), postwar industrial decline (1945-1955), readjustment (1955-1965), technological breakthrough (1965-1975), resurgence (1975-1985), over-optimism (1985-1990), and the search for "replacement industries" (1990-).

Moreover, we have learned that economic success is the product of high educational attainment and wise investment in the future. New England forgot that in the heady days of a decade ago. Gliding along on its international prominence as the prototype of post-industrial success, the region tripped into the 1990s as a global embarrassment.

That stumble notwithstanding, New England's economy has been transformed, thanks largely to the capacity of the region's colleges and universities to nourish a pool of highly motivated people who consistently push new frontiers in the arts, sciences, management and policy.

Indeed, the complex story of New England's constant reinvention is a tale of high skills combined with intellectual and technological leadership. New England has out-produced other regions of the nation in awarding degrees in those scholarly and professional fields required by a technology-driven economy, while leading the way in cutting-edge research and development. Our graduates have gathered and directed the investment of 25 percent of the venture capital available in the United States.

All this has been accomplished despite some clear disadvantages, namely a lack of state or regional manpower planning and very limited state investment in higher education generally, and in university research specifically.

Since the mid-1980s, state governments elsewhere — and indeed, governments around the globe — have mounted major, well-funded programs to expand access to higher education and encourage commercialization of academic research through technology transfer. Ironically, their goal, in many cases, has been to replicate the success that New England serendipitously pulled together over the decades. Very slow-

ly, the process is moving full-circle, as ventures across the nation have begun to influence public policy in New England — and none to soon. State government in New England invests less public revenue in basic and applied R&D than any other region of the United States.

**N**ew England's lack of state investment in R&D reflects not only the region's deep reliance on federal dollars, but also a fair amount of smugness. As New England becomes increasingly vulnerable to foreign and domestic competition in the vital fields of financial services, engineering, advanced instrumentation, biotechnology, envirotech, software, health services, telecommunications and tourism, the region can no longer afford to be self-congratulatory about its academic performance or complacent about its gifted corporate, government or educational entrepreneurship.

Farsighted state and regional policy is needed in this decade to meld the common insights and interests of corporate, higher education and government leaders into a unified strategy aimed at bolstering New England's skilled workforce and enhancing the region's technological prowess.

On the first count, bold collaborative steps are needed to forge a comprehensive, coherent manpower policy aimed at developing a labor force with the capacity to think and solve problems and the flexibil-



ity to meet the pace of economic change. This growth policy must feature: joint initiatives to correct the continuing pattern of wasted human resources that has been allowed to prevail in New England's public schools, particularly in cities across the six states; a coherent school-to-work transition system for high school students who are not college-bound; stable funding of public higher education and student financial aid; and redoubled efforts to increase the participation of adults, particularly minorities, in a responsive system of continuing education.

If New England is to sustain and build upon its technological prowess, we will need to: enhance support for basic research; further encourage research collaboration between public and independent universities; create appropriate incentives to commercialize research through university-industry partnerships; develop university-business liaisons to protect intellectual property rights and ensure a world-class system for product development; reassess the region's heavy reliance on federal research support; and take steps to upgrade and maintain state-of-the-art laboratories.

All these steps will require better planning, greater collaboration and a higher level of corporate support than any U.S. region has yet exhibited. Indeed, business, government and higher education must all respond with imagination and long-term commitment to ensure quality education and training for New Englanders of all ages.

While such investment undoubtedly will require bottom-line sacrifice, the commitment to education is also a matter of self-interest. The centrality of knowledge to continued regional prosperity is indisputable. As international competition intensifies, knowledge must be qualitatively applied more rapidly to the solution of technical, economic and social problems than at any point in our history. Education is instrumental in creating good jobs, challenging careers worth pursuing and a satisfying life. Education is also critical to increasing productivity and improving the quality of New England products and their acceptance worldwide. Moreover, the connection between quality education, R&D and the creation of good jobs is axiomatic. A concentration of richly skilled people and flexible modes of providing venture capital will quicken the pace of innovation

throughout New England.

But is New England prepared to invest creatively in the fundamentals that underpin economic success? And are the policy lessons of New England's economic triumphs and travails fully understood? Do we have the vision to ensure educational equity and quality for all our people? Or will greater numbers be left behind without skills?

In the next decade, it will become clear whether New England has wisely invested her renewed prosperity or tripped again.

**W**ith the support of thousands of New Englanders over the past four decades, the New England Board of Higher Education has sought to clarify higher education and economic development issues and place the region on a strong footing.

NEBHE has emphasized partnerships. The board has convened New Englanders from all sectors to explore issues ranging from the globalization of higher education to the potential of New England's biomedical industries to the role of lawyers in the region's economy.

Among more recent initiatives, NEBHE last year established a Regional Commission on Telecommunications and Distance Learning to examine ways the six New England states and the region's colleges and universities can collaborate to develop and coordinate world-class telecommunications and distance learning programs. NEBHE also recently created the New England Technical Education Partnership, uniting educators and other professionals to improve New England's school-to-work and Tech-Prep programs.


Both projects are the result of longstanding interest. NEBHE explored the promise of the nascent field of educational telecommunications as early as 1959. The board sounded warnings about the lack of opportunities for non-college-bound students a full 25 years before the report of the William T. Grant Foundation popularized the term "Forgotten Half."

Moreover, NEBHE has emphasized partnerships aimed at achieving equality and success for all students. In 1989, the board's report *Equity and Pluralism* offered major recommendations to ensure greater participation and success among Blacks and Hispanics in New England higher education and the educated workforce. Last year, with

support from the Pew Charitable Trusts, the Ford Foundation and others, NEBHE and two other regional education agencies — the Southern Regional Education Board and the Western Interstate Commission for Higher Education — launched the "Compact for Faculty Diversity" program to increase the number of African-Americans, Hispanics and Native Americans who complete Ph.D.s and enter college teaching.

In short, NEBHE has been able to cut through New England's "pride of institution" and bring diverse interests to the table to chart a course for progress. But, as always, there is much more to be considered now than ever before.

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

  
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## New England Higher Education and Economic Development

# Reflections on 40 Years



John O. Harney

The early to mid-1950s was a pivotal time for New England higher education and New England economic development, and perhaps most importantly, for the relationship between the two.

The Servicemen's Readjustment Act, known as the G.I. Bill, had given veterans the chance to go to a college or university of their choice with tuition fully paid. Nationally, from the end of World War II in 1945 through 1956, nearly 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.

Michael J. Bennett, a former Boston newspaper reporter who has researched the G.I. Bill, noted, "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.”

Higher education was no longer for the privileged few. From 1939 to 1954, college enrollment in New England nearly doubled, rising from 88,428 to 172,093. Moreover, the U.S. Supreme Court’s 1954 ruling that separate educational facilities are unequal and unconstitutional, though aimed at elementary and secondary schools, sent a compelling message to colleges that the composite sketch of the American student must change.

The economic role of New England colleges was changing, too. University research had helped win World War II, and now it would be deployed in the Cold War. The Massachusetts Institute of Technology and a handful of other New England institutions quickly emerged as the federal government’s chief research partners.

In 1950, the Air Force asked MIT to create Lincoln Laboratory to develop a computerized air defense system for the

North American continent. A year later, An Wang founded Wang Laboratories, a spinoff company from Harvard’s Computation Lab. The notion of *high technology* was finding a place in the New England consciousness. And just in time.

New England’s once-vaunted textile industry was fraying; it had shed more than 100,000 jobs between



the end of World War II and 1954. Also in 1954, Congress passed the St. Lawrence Seaway bill, opening the way for ocean vessels to reach the inland ports of the Great Lakes and raising doubts about the future of Boston and the other New England seaports that once sent Yankee traders around the globe.

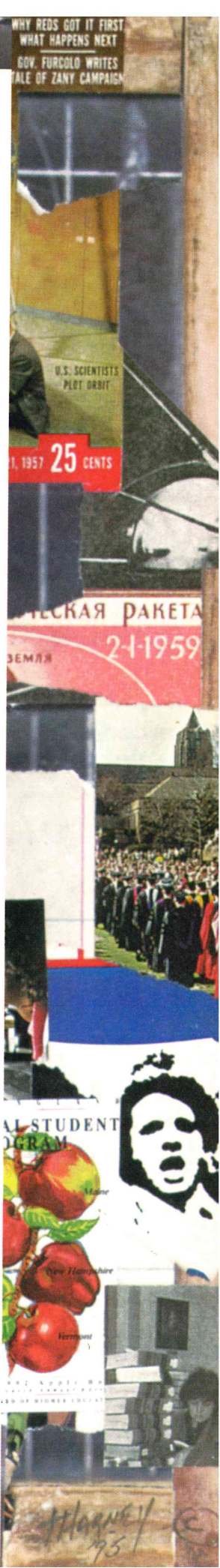
The time was also ripe for *regionalism*. Southern states had formed the Southern Regional Education Board in 1948. Western counterparts followed with the Western Interstate Commission on

Higher Education in 1953.

In the traditionally independent New England states, the beginnings of a similar interstate education initiative began to take shape in 1953, when the Massachusetts Medical-Dental School Commission sponsored regional conferences in which representatives from the six New England states explored ways to expand training opportunities in medicine, dentistry and veterinary medicine.

A year later, six visionary New England governors — Abraham A. Ribicoff of Connecticut, Edmund S. Muskie of Maine, Christian A. Herter of Massachusetts, Lane Dwinell of New Hampshire, Dennis J. Roberts of Rhode Island and Joseph B. Johnson of Vermont — agreed to the New England Higher Education Compact. In 1955, the New England Board of Higher Education was established to pursue the compact’s aims, namely to expand educational opportunity and foster cooperation among the region’s colleges and universities.

The rest, as they say, is history. ...



Magway  
95





1955 - 1995

# The Postwar Evolution of New England Employment

*Are the historic forces of economic renewal once again at work in New England?*

**Katharine Bradbury and Lynn Browne**

**T**he New England economy is very much a product of its past. It was one of the earliest areas of the United States to industrialize, partly because it was one of the earliest areas to be settled, but partly by necessity. Farming could never be much more than subsistence because of rocky ground and, apart from trees to make paper, the region lacks abundant natural resources. Thus, New Englanders were forced to industrialize.

Necessity, however, is said to be the mother of invention, and the region was highly successful in industrializing. The key industry early on was textiles, but New England had a wide variety of industries: machine tools, leather goods, guns, furniture, even steel and autos. Indeed, Massachusetts was a major competitor with Michigan's infant auto industry at the turn of the century. All around the region, the mills and machine shops of the 19th century are still in evidence.

Great wealth was created in this period, wealth that is reflected in the region's infrastructure. Subways, reservoirs, museums and universities were all built during the 19th and early 20th centuries with industrial dollars. The success, however, created some problems. In particular, the region has a complete infrastructure, but mostly an old one.

More fundamentally, some industries that grew up in New England were ultimately better suited to other regions, particularly as their operations standardized; these industries moved away. Textiles was the classic case. As textile production became more routine and detached from New England's entrepreneurial and innovative advantages, the industry drifted to the southern United States and from there, eventually, overseas. Leather goods followed.

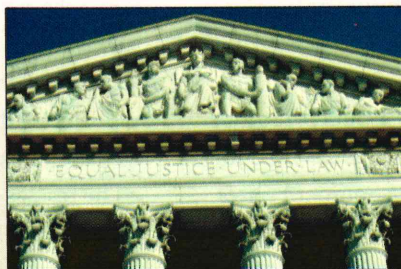
Replacement industries emerged: fabricated metals, later electronics, then computers. But New England is in a perpetual cycle, with some industries shrinking and others emerging. The region has survived and prospered through these cycles, taking advantage of its high educational level, concentration of financial resources and network of sophisticated manufacturing and service businesses — all legacies of its early prosperity. Indeed, despite its vicissitudes, New England over its history has maintained among the highest per-capita income of any U.S. region.

The last four decades have seen a continuation of this pattern. (See Chart 1.) While New England employment has generally grown more slowly than the nation's, the differential has been much more pronounced in some periods than others, and these differences can often be traced to the performance of key

## THE FIFTIES

### 1955

- The New England Board of Higher Education is established as the executive arm of the New England Higher Education Compact with Boston University Chancellor Daniel Marsh as its first chairman.
- U.S. Supreme Court orders "all deliberate speed" in the integration of public schools.



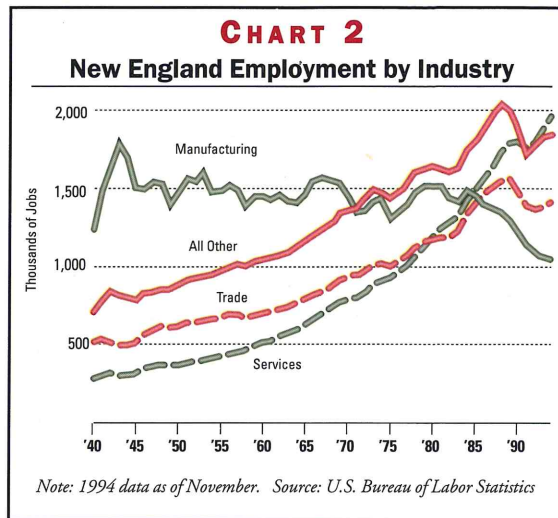
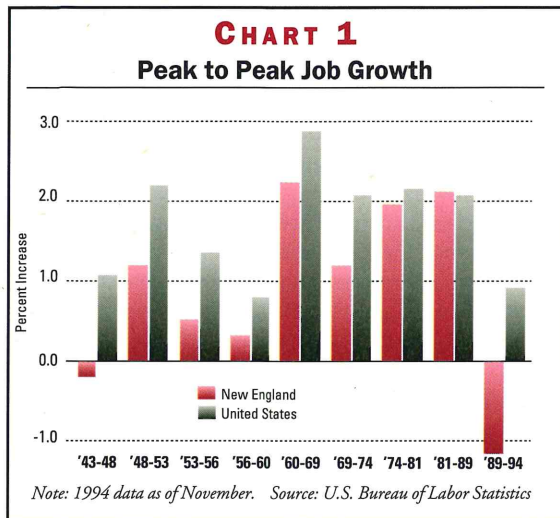
- Nearly 190 New England colleges and universities — more than half of them four-year colleges — enroll approximately 180,000 students. U.S. enrollment is estimated at 2,653,000.

### 1956

- Massachusetts Higher Education Assistance Corp., later renamed American Student Assistance, is chartered as a private, nonprofit organization to administer student loans.
- Women account for 35 percent of U.S. college students.







sectors. (See Chart 2.) Until recently, manufacturing played a particularly important role in the rise and fall of the region's fortunes.

Manufacturing in New England fared poorly in the early 1950s, with much of the region's huge textile industry succumbing to the competition and lure of the South. Manufacturing and the New England economy as a whole were buoyed by growth in defense and aerospace spending during the 1960s, and suffered in the early 1970s as the winding down of the Vietnam War brought sharp defense cutbacks. Increased import competition, as well as continuing competition from southern states, also contributed to job losses in the region's textile, leather and other traditional manufacturing industries in the 1960s and 1970s.

New England began gaining ground in the late 1970s as high tech, especially computers, faced an exploding national and international demand. At the very end of the decade, renewed attention to defense further boosted local manufacturers. Partly because of defense and high tech, New England suffered less in the recession of 1981-82 than the country as a whole, and its recovery was vigorous.

At the end of 1984, however, New England began losing manufacturing jobs again. For a time, this loss

reflected national trends. But when a decline in the value of the dollar in foreign exchange markets began to bolster U.S. manufacturing employment, New England did not follow. Manufacturing in the region continued to shrink.

Nonetheless, total employment in New England grew strongly in the mid- and late 1980s, propelled by a boom in construction and real estate and financial services, as well as strong growth in retail trade and services. (See Chart 3.) Unemployment in the region averaged 3 percent in the mid-1980s.

Inexorably, the cycle turned again; New England fell into recession in early 1989, about a year and a half before the national recession began. The proximate cause of the early downturn was a real estate and construction bust, but a contributing factor was the continuing shrinkage in manufacturing jobs. With the defense buildup over and the region's computer industry struggling, the region lacked the foundation to support so much construction and real estate activity. The economy imploded. New England suffered considerably larger employment losses than other regions of the country in the national recession of 1991-92. One in 10 New England jobs were lost, and regional unemployment was above 8 percent during much of the recession.

- Gallup Poll shows New Englanders far more likely than other Americans to cite "unemployment" as the most important problem facing their region.

#### 1957

- The New England Higher Education Compact receives legislative approval in Rhode Island, completing ratification by all six New England states.
- NEBHE establishes the New England Regional Student Program,

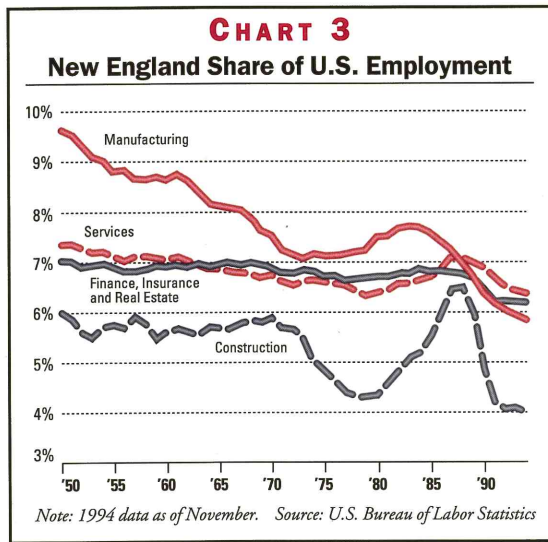
enabling New England students to pay the lower in-state tuition rate at out-of-state public land-grant universities within New England if they pursue certain academic programs that are not offered by their home state's public institutions.

- NEBHE publishes *Two Surveys*, the predecessor of *FACTS: THE DIRECTORY OF NEW ENGLAND COLLEGES, UNIVERSITIES AND INSTITUTES*.
- NEBHE receives \$10,000 from the W.K. Kellogg Foundation to study supply and demand of dental personnel in New England.

- The First National Bank of Ipswich (Mass.) issues the nation's first guaranteed student loan to a student at Endicott Junior College.
- Convinced that computers have tremendous commercial potential, Kenneth H. Olsen leaves MIT to form Digital Equipment Corp.

**digital**





New England is now experiencing a moderate recovery. The regional economy bottomed out in early 1992, and for almost three years, New England has been adding jobs, albeit more slowly than the country as a whole. The regional unemployment rate in December 1994 was 5.3 percent — about the U.S. average.

The perplexing question, however, is whether the region's recovery represents simply the rising tide of a vigorous national recovery lifting all ships, even those of questionable seaworthiness, or the historic forces of renewal once again at work in New England. The pattern of employment growth in the region has raised concerns about the underpinnings of the pick-up. Yet, like the shift from agriculture to industry and from textiles to high tech, it could signify the emergence of another cycle.

Because of New England's early industrialization, the region has always been more manufacturing-oriented than the country as a whole, and manufacturing has traditionally been central to the region's prosperity. (See Chart 4.) Until very recently, however, New England's manufacturing sector continued to lose jobs. Most of the region's job recovery has been in service industries, with construction and retail trade also expanding.

High productivity growth explains some of the weakness in manufacturing employment. Additionally, manufacturers in both New England and the nation are making greater use of contract workers supplied by personnel supply agencies; these workers show up in the statistics as service employees even when they are working for manufacturing establishments. But while New England's manufacturing sector is certainly healthier than the jobs numbers alone would suggest, continuing defense cuts and restructuring in the computer industry mean that manufacturing is not providing the impetus that traditionally has brought prosperity in New England. Can services fill the gap?

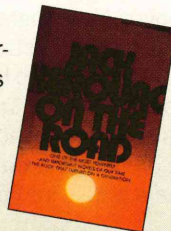
Growth in services is intrinsically unsatisfying. Although one can find plenty of examples of economies which have been driven, in large part at least, by services, neither the economics profession nor the public at large really feels comfortable with the concept of services-led growth. Part of the problem is that the service industry is a hodgepodge category ranging from software to car repair and legal services to window-washing, as well as the region's important health service and educational service industries. Moreover, firms within a given service industry may be very different in character. Thus, to know that growth is occurring in business services, or even in personnel supply or management services, is not to know very much. The activities of large consulting firms and law offices with national and international client bases are a stimulus to a host of other industries, such as transportation, communication, printing and advertising, while the activities of one-man/woman operations serving purely local clients are individually imperceptible. And then some businesses straddle several activities and defy classification — a little consulting, a little computer programming, possibly a venture out of services into asset management or real estate development. One can look at services under a finer and finer magnifying glass and still wonder what is driving this growth.

In thinking about New England's future, it may be necessary to abandon the traditional industry-by-industry approach and think more in terms of the

- Soviet Union launches Sputnik 1 and Sputnik 2, the first man-made satellites, setting off a superpower race for scientific and technological superiority. United States launches Explorer I a year later.



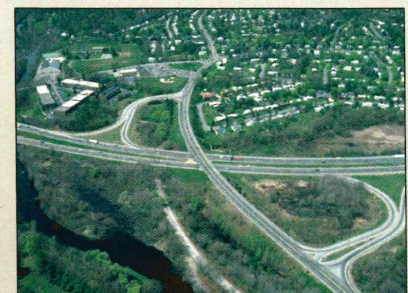
- Lowell, Mass., native Jack Kerouac publishes *On the Road*.
- University of Maine President Arthur A. Hauck assumes NEBHE chairmanship.



### 1958

- Route 128 is completed as the first circumferential highway around a

major U.S. city. As the final sections open, the original stretch from Wellesley to Lynnfield, Mass., is already dotted with high-tech companies.





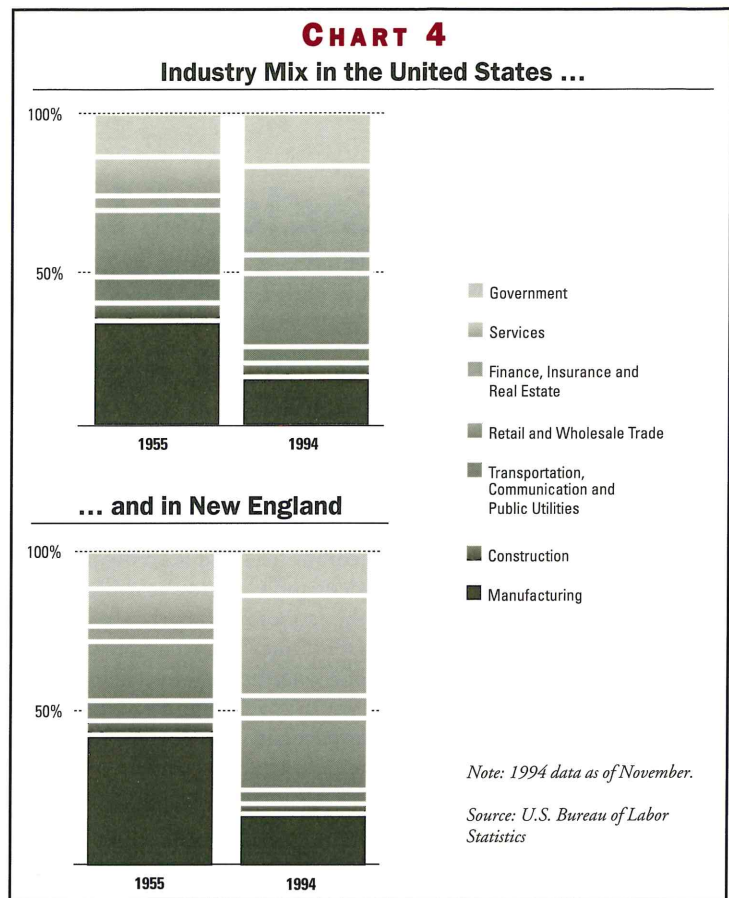
region's underlying strengths and weaknesses. The industries located here and the pickup now occurring reflect New England's longstanding strengths and advantages, especially the skilled workforce and the physical and cultural attractions that make the region an appealing place to live and do business. While New England's population has grown more slowly than the country's since early settlers sought their fortunes in the West, labor force participation has tended to compensate. Labor force participation rates historically have been higher in New England than elsewhere, especially among women. This has allowed employment to expand relative to population and contributed to the region's relatively high income.

New England is widely known as an educational center, a position that helps to explain its combination of entrepreneurial vigor and leading-edge technology. The region's adaptability to changing technology as well as general attractiveness to business has been enhanced by a workforce that is more highly educated than that of other regions of the country. Furthermore, the region's economy has benefited tremendously from the interaction between industry and academe.

Recently, however, some researchers have raised the possibility that efforts to establish technology and education centers in other parts of the country have eroded New England's edge in this regard. This is troubling because New England, lacking in more obvious assets, truly does seem to live by its wits. Many of the region's high-tech firms grew from a researcher or an idea developed at local universities. And in a more service-based economy, the payoff for brainpower can only be greater.

Another longstanding strength of New England has been the diversity of institutions that make financial resources available to local businesses. Historically, the region has had a concentration of expertise in venture capital. The recent downturn took a heavy toll on New England banks, but these institutions are now steadily recovering. And one consistent source of job growth in the last few years has been nonbank financial services and securities firms, including money management and mutual funds.

Looking ahead, the near-term outlook for New Eng-



land's economy is favorable; 1995 is likely to be a year of continued, although moderate, growth. New Englanders can also expect the next few years to be more stable than either the mid-1980s boom period or the recent recession. Longer term, the question remains whether the transition to more services-based growth represents the end of one cycle or the start of another.

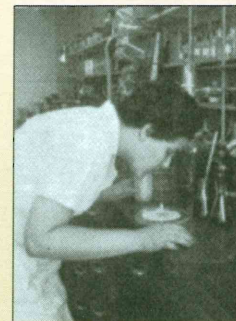
*Katharine Bradbury is an assistant vice president and economist at the Federal Reserve Bank of Boston. Lynn Browne is a senior vice president and director of research at the bank.*

- President Eisenhower signs National Defense Education Act, authorizing grants to colleges to provide low-interest, long-term loans for college students and fellowships for graduate students.



- Following the recommendations of a panel of legislators and higher education leaders, Massachusetts Gov. Foster Furcolo proposes the adoption of a statewide system of community colleges. At the time, Holyoke Junior College and Newton Junior College — New England's only publicly supported two-year public colleges — enroll about 900 students.

- MIT spins off MITRE Corp., an independent nonprofit company, to develop air defense systems and pursue other engineering projects for the military. Fifteen years later, MIT would spin off another key military research facility — the Charles Stark Draper Laboratory.







1955 - 1995

# New England Labor Markets: A 40-Year Retrospective

*In the early 1950s, the economic incentive to attend college was slim.*

**Paul E. Harrington and Andrew M. Sum**

**I**n the early 1950s, the outlook for the New England economy was grim. Three separate national committees had been organized by the president and Congress to explore solutions to the economic woes that beset the region at that time. These committees identified a wide array of economic disadvantages in the region, including comparatively high fossil fuel, electricity, material transport and construction costs, relatively high taxes and poor land and natural resources.

The only locational advantage that could be identified was low labor costs; New England's average wages were about 10 percent below those of the country as a whole. Yet, despite this apparent advantage, New England lost 110,000 low-wage textile jobs between 1947 and 1954. So, as the New England Board of Higher Education was being formed, New England's economy was characterized by stagnation and severe structural problems. There seemed to be little prospect of strong, sustained growth in the near future.

New England's economic troubles did not go unnoticed by the region's institutions of higher education. Harvard University President James Conant began expanding student recruitment efforts to other parts of the United States.

Wariness about the future role of New England's colleges and universities seemed well-founded at the

time. College graduates did not constitute a substantial share of the region's population. Fewer than 7 percent of New England adults had finished 16 or more years of schooling by 1950. (See Table 1.)

At the same time, fewer than half of the region's adults had graduated from high school, and few jobs required advanced schooling. Indeed, about half of Massachusetts residents who held jobs in 1950 had not graduated from high school. (See Table 2.)

Manufacturing firms remained the dominant employers of New Englanders at mid-century. In 1954, more than 42 percent of all New England wage and salary jobs were in manufacturing plants. (See Table 3.)

Production processes in these plants were characterized by highly specialized, but simple and repetitive, labor tasks that were best learned on the job. New England manufacturers employed mostly blue-collar production workers with relatively little formal schooling. More than 60 percent of all New England manufacturing jobs were held by high school dropouts; fewer than 4 percent were held by college graduates.

New England's economic structure generated a limited demand for graduates of the region's colleges and universities. College graduates most often found jobs in the region's nascent professional services industry. Though this industry accounted for only

- Federal government establishes Advanced Research Projects Agency to oversee military space research.



## 1959

- NEBHE receives \$70,500 from the Carnegie Corp. to study supply and

quality of college teachers in New England.

- NEBHE begins studying use of educational television in the region's colleges and universities.
- Connecticut and Rhode Island authorize their teachers colleges to become state colleges; other states soon follow suit.
- St. Lawrence Seaway opens.
- University of New Hampshire President Eldon L. Johnson assumes NEBHE chairmanship.



one in eight New England jobs in 1950, it employed nearly half of all working college graduates.

In short, college graduates were heavily concentrated in the then-small segment of the New England labor market dominated by education, health and legal services. Moreover, during the late 1940s and early 1950s, job growth in New England's service industries was only about equal to the sluggish pace of the region's overall job growth.

The average annual earnings of New England professionals in 1950 was only \$2,640 — 4 percent less than the average for skilled blue-collar workers. The economic incentive to attend college then was slim, and the outlook for New England higher education did not appear bright. It must have been with considerable trepidation that the founders of NEBHE came together to forge a stronger relationship between higher education and the broader business community.

Forty years later, the demand for college graduates has reached an all-time high. Enrollments at both the undergraduate and graduate levels have expanded enormously, while tuition, fee and endowment revenues have substantially outpaced inflation. Why this enormous reversal in the fortunes of New England higher education?

The answer lies in the fundamental changes that have taken place in the industrial structure of the New England economy. In 1950, the manufacturing sector was New England's primary employer, providing blue-collar jobs filled mostly by New Englanders who had not completed high school. The share of all jobs that were provided by the service industry had changed little since 1890, when about 13 percent of all workers held service-sector jobs.

Professional services were unique in that the primary inputs into the production process were not physical labor, capital or land, but knowledge and technical ability. The production of these services required the application of expertise. Unlike manufacturing, where most production and maintenance skills were learned in an actual job setting through apprenticeship and on-the-job training, the professional obtained a set of skills

**Table 1**  
**Distribution of New Englanders, Age 25 and Over, by Years of Schooling, 1950 and 1990**

Years of Schooling	1950	1990
Less than 12	57%	23%
12 only	25%	25%
13 to 15	7%	25%
16-plus	7%	28%

**Table 2**  
**Educational Attainment of Massachusetts Workers, Age 16 and Over, 1950 and 1990**

Years of Schooling	1950	1990
Less than 12	49%	12%
12 only	30%	28%
13 to 15	11%	29%
16-plus	10%	30%

**Table 3**  
**Distribution of Wage and Salary Employment by Major Industrial Sector in New England, Third Quarter of 1954 and 1994**

	1954	1994
Manufacturing	42%	17%
Transportation, Communication, Utilities	6%	4%
Trade	19%	23%
Finance, Insurance, Real Estate	5%	7%
Services	13%	32%
Government	12%	13%

and knowledge in the classroom, which would then be applied in highly variable situations.

The role of professionals in the New England economy changed little between the end of the 19th century and the middle of the 20th century. But during the past 40 years, a transition has occurred.

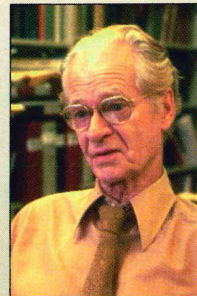
Not only have the traditional professions grown in size, stature and economic importance, but a vast



**THE SIXTIES**

**1960**

- In the face of increased demand for higher education, NEBHE predicts a shortage of higher education facilities and resources in New England.
- NEBHE holds conference on college teaching. Among speakers, Profes-



sor B.F. Skinner of Harvard discusses new teaching methods that allow students to work at their own pace.

- Berkshire Community College is established as the first state-supported community college in Massachusetts.
- Rhode Island Legislature votes to establish three public community college campuses.



## ENROLLMENT GROWTH AT SELECTED NEW ENGLAND INSTITUTIONS

	1956-57	1994-95*	% Change
<b>Independent Institutions</b>			
American International College	1,791	1,881	5
Bowdoin College	825	1,498	82
Brown University	3,672	7,655	108
Bryant College	1,567	4,280	173
Dartmouth College	3,095	5,372	74
Harvard University	10,566	25,825	144
Massachusetts Institute of Technology	5,648	9,790	73
Roger Williams University**	327	3,780	1056
Trinity College	1,324	2,171	64
Tufts University	4,083	8,340	104
Wellesley College	1,714	2,349	37
Wesleyan University	900	3,326	270
Yale University	7,157	10,975	53
<b>Public Land-Grant Universities</b>			
University of Connecticut	10,667	22,505	111
University of Maine	3,750	11,343	202
University of Massachusetts (Amherst)	4,146	24,298	486
University of New Hampshire	3,339	13,905	316
University of Rhode Island	2,570	14,925	481
University of Vermont	3,015	10,242	240
<b>Other Public Institutions</b>			
Eastern Connecticut State University***	508	4,576	801
Holyoke Community College†	371	5,703	1437
Johnson State College††	160	1,624	915

\*1994-95 figures include students who are not enrolled in degree programs.

\*\*Formerly Roger Williams Junior College

\*\*\*Formerly Willimantic State Teachers College

†Formerly Holyoke Junior College

††Formerly Johnson Teachers College

Source: New England Board of Higher Education

professional services industry, but are diffused across all major industrial sectors, including manufacturing. Today, the typical New England worker holds a college degree and works in a professional, managerial, technical or high-level sales position.

A comparison of the Massachusetts 1950 and 1990 censuses brings this into sharp relief. At mid-century, fewer than one in 10 Bay State workers had completed 16 years of schooling, and fewer than one in five had any postsecondary schooling. Yet, by 1990, 60 percent of those employed in Massachusetts had some postsecondary education, half of them holding at least a four-year college degree. The rapid growth in demand for college-educated personnel is illustrated by the fact that between 1950 and 1990, two out of three net new jobs would be filled by a worker with a college degree. By 1990, high school dropouts accounted for fewer than one in eight employed New Englanders, compared with half of all workers in the region in 1950. By 1990, employed college graduates earned 67 percent more than those with high school diplomas, and this earnings premium has grown through the first half of the 1990s.

Clearly, during the past 40 years, a powerful wave of economic and technological changes has transformed New England. Instead of being characterized as an economically depressed backwater employing poorly educated workers in unskilled and semiskilled jobs, New England has recreated itself, with the overwhelming share of job growth taking place in industries and occupations requiring both higher levels of academic skills and specialized knowledge usually attained in formal school settings. New England's colleges and universities have played a central role in this process of change by both accommodating the increasing demands for a skilled workforce and sometimes by directly generating a demand for such workers through the creation of new knowledge and its application to solving an array of economic, technological and social problems.

*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.*

array of new professions have been created, based on the development of whole new fields of specialized knowledge. Furthermore, these diverse types of specialized knowledge are no longer applied only in the



- John F. Kennedy of Massachusetts is elected president of the United States.

### 1961

- Connecticut opens state technical institute in Norwalk amid calls for more technical education beyond high school. By 1977, the state would host five technical colleges, which would merge with community colleges in 1992.

### 1962

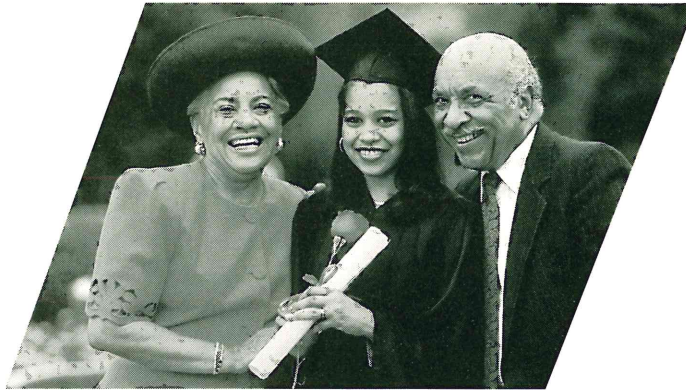
- Rachel Carson publishes *Silent Spring*, heightening awareness of environmental issues.

- The stock market collapses.





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Rhode Island's public higher education system is committed to equal opportunity and affirmative action and is an active participant in the NEBHE Regional Student Program (RSP). For more information, write the Rhode Island Office of Higher Education, 301 Promenade Street, Providence, RI 02908.

**T A K E A L O O K A T U S ! ! ! ! !**





1955 - 1995

# Inventiveness

*A plan to keep New England on the cutting edge.*

Ira A. Jackson

**N**early eight years ago, *The Economist* ran a survey of the New England economy titled “A Concentration of Talent,” concluding that “New England feeds off human capital; it has nothing to offer the world but its own inventiveness.”

The same observation could have been made 40 years ago when the New England Board of Higher Education was established — or at almost any point throughout the region’s history. From the automated power loom to the telephone, the computer to radar, artificial skin to venture capital, the creations of inventive people have given New England its distinction.

Of course, higher education has played a leading role in helping to educate talented people who, in turn, create new products and services that are vital to the region’s future prosperity. Indeed, New England continues to field a workforce with a higher percentage of professional, managerial and technical talent and a higher share of college degrees than any other region of the country.

The region’s colleges and universities act as headhunters, drawing the brightest undergraduates from all over the world. The institutions add value by educating the students and competing successfully for federal research grants, which, in turn, attract top faculty and graduate students. Graduates often stay nearby, starting a business, helping to expand one or providing the technical, engineering or scientific skills needed to sustain innovation and product development.

As the late Yale University President Bart Giamatti

noted at a 1986 conference on education sponsored by the New England Council, “New England has built its economy and its sense of itself on professional, scientific and technological education. It built much of its regional marketing on that kind of education; it builds its industrial clout and its political muscle on it.”

The rapidly expanding sophisticated services sector is a case in point. In recent years, traditionally strong service industries such as finance and health care have been supplemented by high-tech services, international marketing and consulting. Management consulting is one of the fastest growing segments of knowledge-intensive services that draws on talent from the region’s colleges and universities. Fierce competition among companies, the accelerated pace of product development, the challenges of exporting and the complexities of efficiently using computers and software all have contributed to this industry’s rapid growth.

**A** critical component of New England’s higher education infrastructure is the region’s research complex. During the past 40 years, research has been closely linked to higher education and business innovation. The region’s universities played vital roles in defense research in the 1950s, and many of the small high-tech firms that emerged in the 1950s and ’60s can trace their beginnings to federal R&D contracts.

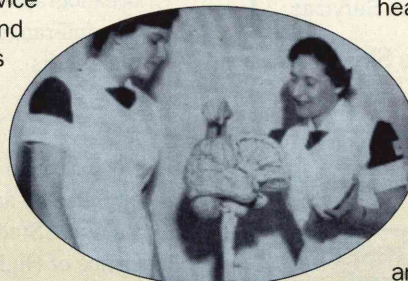
In the subsequent decades, technological advances coming out of our colleges and universities created new products, improved processes and entirely new industries.

- John W. McCormack, a Democratic congressman from Massachusetts, becomes speaker of the U.S. House of Representatives. He would serve in the post until 1971.

.....  
**1963**

- New England governors, state legislators and educators meet to discuss higher education and economic growth at NEBHE Legislative Work Conference in Portsmouth, N.H.

- New Hampshire unifies its land-grant university and state colleges under one board of trustees.
- Passenger rail service between Boston and Portland, Maine, is terminated, as transportation policy focuses on highway-building. Passenger train service between Boston and New Hampshire points would also be derailed.



- Congress passes Health Professions Educational Assistance Act, funding expanded teaching facilities and loans for students in the health professions. The Higher Education Facilities Act authorizes grants and loans for classrooms, libraries and laboratories in community and technical colleges and other higher education institutions.



When some of the best job-producers of the late 1970s and 1980s — namely, manufacturers of computers and electronic components — matured, New England looked to the research and talent coming out of its universities and colleges for job-producing replacement industries such as biotechnology, advanced materials, information technologies and software.

But other regions have learned from New England's experience and, as they compete to be knowledge-intensive, our strengths in attracting both talent and research dollars are at risk. For example, New England's share of total college enrollment slid from a recent high of 6.5 percent in 1985 to 5.7 percent in 1992; the region's share of university R&D spending dropped from 10.1 percent in 1983 to 8.8 percent in 1993, according to a NEBHE analysis.

What's more, we are losing some of our prestigious research labs. Many New Englanders were stunned in 1990 when the National Science Foundation (NSF) chose Florida State University over the Massachusetts Institute of Technology as the site for a National High Magnetic Field Laboratory. For decades, MIT had hosted a world-renowned magnet lab, where researchers explored important applications for magnets in medical diagnostic equipment, pollution cleanup and consumer products. The NSF's blue ribbon advisory panel recommended that the new center be placed at MIT, but the state of Florida launched a full-court press, promising to contribute \$66 million toward the new lab. The NSF ultimately disregarded the recommendation of its panel of eminent scientists and awarded the center to Florida State. *The New York Times* noted, "It was the most dramatic example yet of a Sun Belt state challenging the Northeast at the very heart of its traditional strength, its first-rate academic institutions."

Its implications were dramatic, too. The region lost far more than \$60 million in federal development money for one laboratory. The decision also cost New England the spinoff industries and jobs such a research center inevitably produces. It was a potent reminder of the critical relationship of research to business formation.

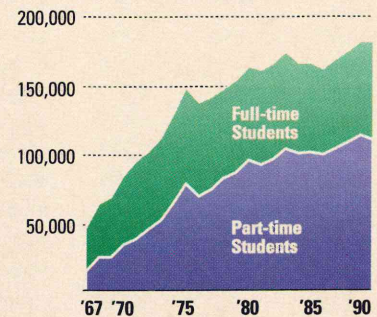
The magnet lab story is not an isolated example; it has been repeated a number of times over the past four years. Last November, the University of Texas lured away an internationally renowned Yale University lab that studies newly discovered viruses, along with the lab's two leading researchers. Again, the significance to businesses that depend on innovation should not be overlooked. With world-class labs, colleges are better able to lure accomplished academics and market themselves to students looking for research opportunities and the guidance of top faculty.

Competition for laboratories is a regional issue that should be addressed through regional action. As important as regional collaborative action in support of higher education was in the past, it will be even more so in the rapidly evolving global economy.

**A** 1991 New England Council report asked "Is it possible to reach a regional consensus or will the pattern of the 1990s be each state for itself, pursuing six distinct destinies?"

The question is as timely today as it was in 1991. Regional action needs to take place on many fronts if New England is to maintain its edge in talent and research. To that end, the New England Council will join with the region's public sector leaders to pursue a four-point strategy.

## ENROLLMENT AT NEW ENGLAND'S PUBLIC TWO-YEAR COLLEGES



Source: U.S. Department of Education

No class of higher education institution has grown as fast as public community and technical colleges. In the late 1950s, two publicly supported two-year colleges enrolled 900 students in New England. Today, 45 New England community and technical colleges enroll about 180,000 students, many of them part-time.



- University of Vermont President John T. Fey assumes NEBHE chairmanship.

### 1964

- Congress passes Civil Rights Act, prohibiting discrimination in public places for reason of color, race, religion or national origin.
- Economic Opportunity Act authorizes grants for college work-study programs for students from low-income families, provides support for programs such as Head Start and Upward



Bound, and approves establishment of Volunteers in Service to America (VISTA).

### 1965

- With passage of the Higher Education Act, the federal government establishes an array of student financial aid programs, including federally guaranteed student loans, as well as aid programs for colleges and universities.

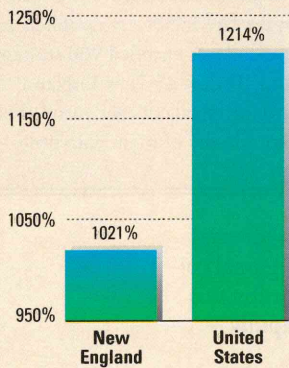


## WORLD CLASS

### Total Foreign Enrollment

	'54-55	'93-94
Conn.	418	5,839
Maine	72	1,360
Mass.	2,524	24,327
N.H.	84	1,793
R.I.	94	2,275
Vt.	65	923
N.E.	3,257	36,517
U.S.	34,232	449,749
N.E. as % of U.S.	9.5%	8.1%

### Increase in Foreign Enrollment, 1954-1993



New England higher education is an export industry, drawing in students from around the world and sending forth heads of state, doctors, engineers and other highly skilled professionals. Foreign students usually pay full tuition, in effect, subsidizing needy U.S. students. Some stay in the United States after graduation, bolstering the nation's skilled workforce.

Japanese nationals make up the largest group of foreign students in New England, followed by students from the People's Republic of China, Canada, India, South Korea and Taiwan. The Massachusetts Institute of Technology, Harvard, Northeastern and Boston universities consistently rank among the top U.S. institutions in foreign enrollment.

Source: Institute of International Education

**Regain the momentum in attracting federal research to New England.** Funds from the Advanced Research Projects Agency (formerly the Defense Advanced Research Projects Agency), the National Institutes of Health and the NSF have enabled New England to maintain a premier research base. New England's congressional delegation must press the case for the allocation of research funds by these and other agencies based on merit, not to equalize scarce

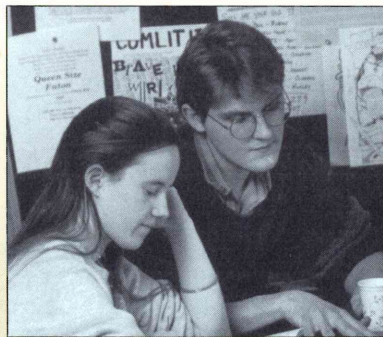
research dollars among regions. The New England Council will work closely with the delegation in pursuing this policy. Admittedly, this will be more difficult than in the past. We have lost political clout, not just this past November but over the years. Still, we have a congressional delegation that is concerned, as we are, about the economy, and is prepared to act in a bipartisan way to support regional interests.

**Advocate in state legislatures for public support of higher education.** This year, our region has continued its unenviable record of the lowest level of public funding for higher education. All the New England states are well below the U.S. average and all but Maine rank in the bottom seven of the 50 states. Members of the New England Council recognize business's self-interest in maintaining the quality of New England's public as well as independent colleges and universities. But this requires an increase in state spending for higher education from the fiscal 1995 regional average of \$5.56 in state tax funds per \$1,000 of personal income toward the national average of \$7.99.

Will greater public funding of higher education make a difference for business? Consider the impact on just one segment of higher education — community colleges — where enrollment has grown faster than at other levels. Community colleges are being called upon increasingly throughout the region to provide a qualified pool of workers and, in the years to come, they are likely to be the entry point into higher education for a much more ethnically diversified workforce.

**Encourage more strategic partnering of companies with colleges and universities.** There are many examples underway. Consider the new on-line computer program developed by the University of Massachusetts at Amherst in conjunction with the Environmental Business Council to help U.S. environmental companies export their technology. Or the High Speed Plastic Network Consortium bringing together plastics manufacturers and University of Massachusetts at Dartmouth researchers to develop and market plastic optical fiber components and systems.

- President Johnson signs legislation establishing National Foundation for the Arts and National Foundation for the Humanities.
- Federally chartered New England Regional Commission, comprised of the six governors and a federal cochairman, is created to promote economic development.
- On the recommendation of Amherst, Mount Holyoke and Smith colleges and the University of Massachusetts at Amherst, Hampshire College is founded as an unstructured institution for motivated students.



- College students march in Boston and other major cities to protest violent resistance to segregation in the South.

- Nearly 600 technology-based businesses are operating along or near Route 128. Over the next eight years, the number would double.
- New Hampshire Technical Institute opens in Concord; the state would host seven technical colleges by decade's end.
- Rhode Island state Sen. Charles H. Bechtold assumes NEBHE chairmanship.



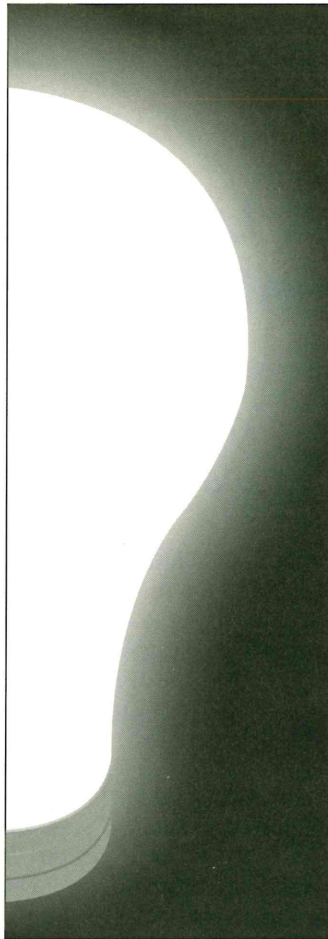
The Production Technology Center at the University of Southern Maine helps firms more quickly adapt technologies in their production processes. Yale University's Center for Theoretical and Applied Neuroscience is a partnership with the business community to provide support for the state's pharmacology and biotech industries. The Science and Technology Center for Computer Graphics and Scientific Visualization at Brown University brings large manufacturers together with university researchers to enhance the productivity and capabilities of scientists, engineers and physicians. We need many more of these collaborations and we need them soon.

In some of these partnerships, business is working with colleges and universities to respond flexibly to changing manpower needs. Vermont's public colleges and universities are now providing customized training for IBM. The New Hampshire Industrial Research Center, a cooperative initiative of the University of New Hampshire, Dartmouth College and the state Department of Resources and Economic Development, was established in 1991 to offer local companies state subsidized technical assistance from academic experts.

*Launch a dialog on ways to form closer ties between higher education and the global marketplace.* New England businesses and colleges and universities should work together to find creative ways of developing better international linkages. Bryant College's International Trade Data Network is a welcome initiative, but business working with higher education also can pursue other avenues to take advantage of our strong global connections. Whether bringing new services and products from the university lab to overseas markets, developing and maintaining strong connections with international students attending area schools or forging other partnerships, business and educational institutions can be doing more.

Looking ahead, new competitive pressures in the world marketplace make it more important than ever for this region to maintain its edge in attracting talent and research. The New England Council — with its broad base of member companies — has a collective and longstanding sense of the dependence of business on these resources. Our members understand all too well the importance of promoting policies and producing returns in higher education that attract investment and keep New England competitive. This should be a priority on everyone's agenda in 1995.

*Ira A. Jackson is chairman of the New England Council and senior vice president of the Bank of Boston.*



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1955 - 1995

# Winners and Losers in a Knowledge-Intensive Economy

*Competitive greatness comes through the agglomeration of research and knowledge in a small number of places.*

**James M. Howell**

**W**hen New England's industrialization began in the 1840s, the application of knowledge — or engineering *know-how* as it was termed in those days — played a decisive role. Now, 150 years later, knowledge is even more central to the regional economy. But the economic fundamentals have changed. During that early period of industrialization, all communities benefited. Now, only a limited number will.

Indeed, if you want to see the positive and negative consequences of industrial change, look at the three distinct economic periods New England has experienced during the past 50 to 75 years.

The first and longest period began around World War I and ended in the 1950s. During this period, nearly one of every two New Englanders was employed in a manufacturing sector dominated by machinery and characterized by relatively simple mechanical processes. These mechanical processes were applied to New England's textile, apparel, shoe and leather industries to achieve higher levels of output for world markets.

The second period began in the 1960s and lost much of its influence by the late 1980s. During this period,

only one in four New Englanders was employed in what we would still refer to as the manufacturing sector, and the means of production were increasingly dominated by electronic processing. New England computer firms such as Wang Laboratories and Digital Equipment Corp. were in the forefront of this transformation, permitting a broad shift in the production process throughout the U.S. economy. The prolific growth of these industries created the era of the so-called "Massachusetts Miracle," sometimes broadened in scope to the "New England Miracle."

The current period, which began in the late 1980s, has led to a much more fundamental shift in New England's productive base. The successful exploitation of knowledge and ideas into new products and services has become the driving force for economic activity. This period has also blurred the line between what we once considered traditional manufacturing and new forms of manufacturing processing based on techniques that, in some cases, did not exist 10 years ago. Perhaps the best example is the new industry we now know as "megatronics," integrating traditional manufacturing and electronics to produce "smart machines." It is probably realistic to conclude that by the end of this decade, only one in 10 New Englanders will be employed in the old, traditional manufacturing.

## 1966

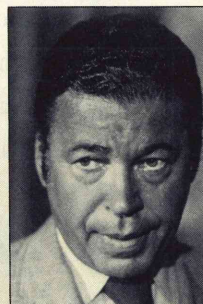
- American Council on Education publishes its first annual report on attitudes of American college freshmen. Among the findings: 58



percent think it's important to keep up with political affairs; 34 percent listened to folk music in the past year. By 1994, 32 per-

cent would consider it important to keep up with politics; the question about folk music would be scrapped.

- Massachusetts voters elect Edward Brooke, the first Black U.S. senator in 85 years.
- Congress passes National Sea Grant College and Program Act, authorizing establishment of programs to support marine



science education and research.

- Congress passes Adult Education Act, authorizing grants to states to expand educational programs for adults.
- University of Connecticut President Homer D. Babbidge Jr., assumes NEBHE chairmanship.





Major changes have accompanied these industrial adjustments. Two dimensions are of particular interest. First are the spatial consequences of the shifts and shrinkage in the region's manufacturing base. The arrival of the Industrial Revolution in New England in the 19th and 20th centuries brought machine tools to Springfield, Vt.; wire pulling to Worcester, Mass.; textiles to Lawrence, Lowell and Fall River, Mass.; and so on. In fact, almost every New England city and town secured a minimum threshold of manufacturing activity. This manufacturing base permitted communities to grow and achieve acceptable income levels for their children.

The most conspicuous result of the shift to electronic-based manufacturing processes was the economic re-emergence from the late 1960s through the 1980s of a number of the previously industrialized "old mill towns," such as Maynard, Clinton and Lowell in Massachusetts. Other cities did not "come back" and remain as too-vivid reminders of a bygone industrial era.

But the spatial shifts associated with the most recent economic transition are now beginning to have a profound impact. In this economy that is increasingly dominated by knowledge-based industries, including information management, health services, financial funds management and higher education and research, the growth poles are concentrated in those few urban places where there are large numbers of research, educational and medical facilities.

Meanwhile, an increasing number of cities and towns — in many instances, older mill towns left over from the original era of mechanical industrialization — are being left behind. Towns such as Lawrence, New Bedford, Holyoke and North Adams, Mass., Berlin, N.H., Brattleboro, Vt., and Bangor, Maine, face little prospect of developing the requisite threshold of educational and research institutions. The best hope for these communities may be to share in some of the benefits that spill over from a contiguous sphere of knowledge-based economic growth.

Within the context of this potentially unenviable outcome, education — particularly higher education — must play an increasingly important role in eco-

### COLLEGE TOWNS

About half of New England's 827,293 college students study in the following higher education hubs:

<i>City/Area</i>	<i>Total Enrollment</i>
Greater Boston	235,767
Springfield/Amherst, Mass.	60,310
Greater Hartford, Conn.	36,387
Providence, R.I.	33,712
New Haven, Conn.	28,939
Worcester, Mass.	24,295
Portland, Maine	20,881
Burlington, Vt.	15,957
Manchester, N.H.	11,864

*Source: New England Board of Higher Education*

nom development. Thus, the second dimension of interest concerns the response of educational institutions to the challenge presented by the shift to a knowledge-based economy.

Higher education has long been viewed as the path to greater opportunity. Traditionally, the role of colleges and universities was to offer qualified students a rigorous program to help them organize their minds, provide a knowledge base and central vocabulary for any one of a number of disciplines — history, engineering, economics, etc. — then watch the students march off to occupational success. Now, the definition of opportunity must be much more broadly defined.

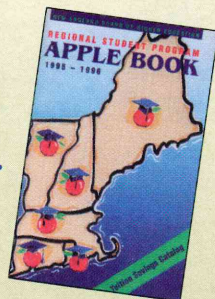
The most troubling dimension of the shift to a knowledge-based economy is that many of the left-behind communities — no matter how they try, no matter how strong their local leadership — are facing local economic development problems for which we have no solutions. The educational mission of colleges and universities then can no longer be just individual access for promising students. We must ask what role educational institutions can play in facilitating greater economic parity for communities that are not now positioned to reap the benefits of a knowledge-intensive economy.

## 1967

- New England River Basins Commission established.
- Median salary for U.S. college presidents is \$24,000.
- Congress establishes Corporation for Public Broadcasting.

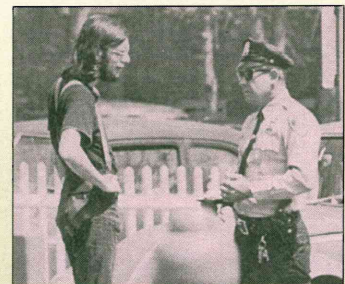
## 1968

- New England community and technical colleges join NEBHE's Regional Student Program.



- From Prague to Paris to Cambridge, college students engage in strikes, sit-ins, demonstrations and clashes with police. In New England, the unrest focuses on student power, academic freedom and the Vietnam War. Gov. Ronald Reagan of California blames the turmoil on a conspiracy of left-wing elements; Connecticut Sen. Abraham Ribicoff

denounces the Chicago Police for their handling of protesters.





Clearly, there are not enough resources to spread the intellectual infrastructure associated with knowledge-based economies around to all communities. The fundamental prerequisite of a knowledge-based economy is research agglomeration — that is, the concentration of many different kinds of sophisticated research functions that become mutually reinforcing. It is absurd to think the most direct step to regional prosperity is to, in effect, divide the Massachusetts Institute of Technology into small pieces and give one piece to each community in New England.

Moreover, it is entirely out of the question to believe that all cities of a certain size should have their own college or university. When we begin to equate higher education with the local Seven-Eleven store, trying to give each community its share of research funding, we have taken a giant step backwards. Competitive greatness comes only through the concentration of research and knowledge in a small number of places, the Boston-Cambridge axis being one of the most obvious.

Thirty years ago, no one would have predicted that New England in the year 2000 would have a large number of cities where successfully managing decline was the most pressing local economic policy issue. This does not mean that we are without options, but we do need to recalibrate our thinking about New England, its cities and our role in them. Educational leaders cannot and must not stand by on the sidelines and let others forge strategies to ameliorate the negative impacts of this new economic change.

As a first step, New England's leadership must acknowledge the emergence of a region marked by spatial concentrations of economic activity predicated on knowledge and research alongside spatial concentrations of economic and social stagnation. College and university presidents who believe it is their role to provide economic and social stewardship to the region then will need to define a truly *regional* agenda.

We have a long way to go before there is widespread acceptance of the fact that all the consequences of a globally competitive, knowledge-based regional economy may not provide blessing for all our cities. Moreover, the outline of a regional agenda for academic

institutions, with all the conflicting and competing interests among them, is far from clear. There are, however, some specific early examples that point the way to what educational institutions can do to help diffuse their economic benefits throughout the region.

The broad initiatives in technology transfer currently being pursued by the University of Vermont clearly recognize the need, while revealing a process through which the university's economic impact can reach far beyond its Burlington home. Through its Vermont Technology Council, UVM recently launched a Partnership in Science and Technology to work collaboratively with all of the state's small and large colleges and universities in and out of Burlington to commercialize research and diffuse the benefits of scientific prowess throughout the state.

The Boston University-Fraunhofer Research Center-Massachusetts Government Land Bank project at Fort Devens is a practical initiative to bring the university's engineering college into contact with small businesses throughout the region. Further, the broader partnership with the North Central Chamber of Commerce means that the benefits from a revitalized Fort Devens will spill over into local communities.

The University of Massachusetts-Lowell partnership with the city of Lowell and Lowell General Hospital to build a major new research facility to address Alzheimer's disease offers another exciting blueprint to renew the city as it seeks to rebuild itself in the post-Wang era.

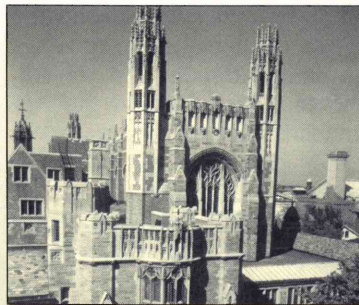
These examples are tied together with a common thread. If the university's research program provides the basis for a knowledge-based community, the university must also recognize its transformed role as the key agent for economic growth and stability throughout New England.

The region's great colleges and universities have no other option but to become more active participants in New England's changing economy.

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*James M. Howell is the president of The Howell Group, an economic consulting firm in Boston.*

- Maine creates a new University of Maine System, encompassing the University of Maine at Orono, a network of four-year state colleges and the two-year college at Augusta.
- Edson de Castro leaves Digital Equipment Corp. to launch Data General; New England spinoff firms, themselves, are now spinning off new companies.
- Maurice H. Saval, president of the American Universal Insurance Co., assumes NEBHE chairmanship.



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**1969**

- Yale University admits women for the first time, as large numbers of historically single-sex institutions go coed.

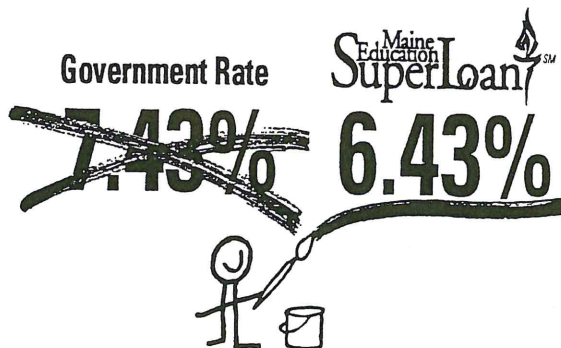
- With key input from Massachusetts engineers, U.S. Department of Defense implements the ARPAnet computer network which would evolve into the backbone of the Internet. Twenty-five years later, 2.2 million time-share computers would be acting as Internet hosts, serving 25 million users.
- College of the Atlantic is founded in Bar Harbor, Maine, offering a single interdisciplinary degree: the bachelor of arts in human ecology.







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1955 - 1995

# New England's Higher Education Compact

*Public higher education makes itself good enough for the best, regardless of their means. But can we continue this profoundly democratic tradition?*

**Andrew G. De Rocco**

**T**he purposes of the New England Higher Education Compact shall be to provide greater educational opportunities and services through the establishment and maintenance of a coordinated educational program for the persons residing in the several states of New England parties to this compact, with the aim of furthering higher education in the fields of medicine, dentistry, veterinary medicine, public health and in professional, technical, scientific, literary and other fields.

— New England Higher Education Compact, Article I

To read the language of the interstate compact that created the New England Board of Higher Education is to appreciate the farsightedness of the six governors who engaged the idea and brought it to fruition 40 years ago. The document, in its way, carries a vision as large as that embedded in the Land-Grant Act of 1862, characterized by the late University of Connecticut President and NEBHE Chairman Homer Babbidge as “a great upheaval in American education — a revolution if you

will — and an important realization. The realization that our colleges and universities were not doing all the good that they might.”

Indeed, NEBHE has evolved in a manner that embraces the unfulfilled promise of our institutions, yet remains faithful to the robust New England tradition that the higher learning of our people is an intrinsic and self-evident virtue. The board’s work also reflects the notion that New England’s institutions are best able to enlarge their horizons when they are granted significant autonomy, but are drawn together as partners to pursue a larger and less immediate public good than individual institutions might recognize or succeed in reaching.

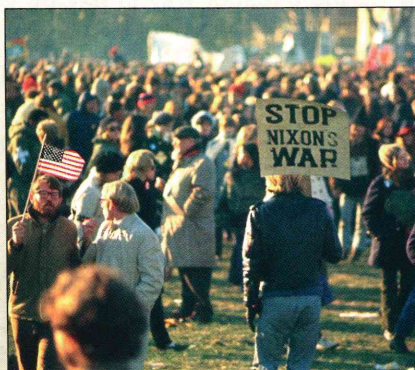
Nowhere has the latter been more in evidence than in Connecticut. During the past four decades, much has been accomplished in the effort to create a comprehensive system of public higher education that — together with our notable independent institutions — instructs, invents and serves.

In 1955, Connecticut’s public colleges and universities were instructing 16,223 students, while independent institutions enrolled 23,206; undergraduates

## THE SEVENTIES

### 1970

- Four students are killed by national guardsmen at Kent State University in Ohio during an antiwar protest, sparking stepped-up demonstrations on New England campuses.
- Congress establishes Environmental Protection Agency, whose pollution regulations would spawn a New



England “envirotech” industry, employing an estimated 110,000 workers by the mid-1990s.

- Michael J. Zazzaro, a Connecticut dentist, assumes NEBHE chairmanship.

### 1971

- Study by University of California business Professor Earl F. Cheit finds colleges and universities facing a “new depression,” marked by rising costs and declining revenue.





outnumbered graduate students by 4-to-1. Today, Connecticut campuses enroll approximately 165,000 students, 65 percent of them at public institutions. Graduate study is conspicuously evident in both public and independent institutions, as talented people push the frontiers of fields unheard of 40 years ago, such as biotechnology and environmental technology.

In short, public higher education plays a very significant role today in making itself good enough for the best, regardless of their means. But can we continue this profoundly democratic tradition?

Today, our "publics" are so in name only. Tuition revenue supports an ever-increasing share of the budget. State investment, directly and by way of financial aid, has shrunk; federal dollars, often for targeted research, are widely sought. But suppose a state legislature were to argue that its interests ought to have as great a claim on research efforts as does the federal government. It might be interesting to see. New England state governments account for just 2 percent of R&D expenditures at New England institutions, compared with 8 percent nationally.

**C**olleges and universities are instrumental in New England's economic recovery. We attempt within our walls to invent the calculus of a new equitable and accessible form of community, which does not sacrifice the fundamentals of democracy or the aspirations of individuals as we have come to know them.

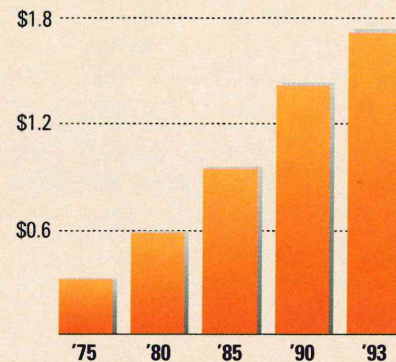
New England's long and distinguished tradition has often demonstrated its resilience and adaptability. We have instructed with internationally acknowledged distinction, provided scholarship of lasting importance in the arts, letters and sciences, and shown early on how to expand knowledge beyond the campus to a wider society.

Each of these attributes must be preserved and elaborated upon in the face of cultural, economic and institutional change that, in combination, higher education has never before experienced. Cost containment, accountability and economic development are constant pressures. Moreover, what in 1954 was a

## NEW ENGLAND LABS

### Research and Development Expenditures at New England Doctorate-Granting Institutions

(Dollars in billions)



Source: National Science Foundation

Between 1955 and 1993, total U.S. expenditures on university research and development ballooned from \$312 million to nearly \$20 billion, fueled in part by a superpower race for technological superiority. Having played a key role in winning World War II, New England universities immediately moved into the vanguard of Cold War research. But more recently, the region's universities have lost ground in the battle for research dollars, with their share of all academic R&D expenditures falling from 10.1 percent in

1984 to 8.8 percent in 1993. Other regions such as the South Atlantic, meanwhile, have developed their R&D capacities. Notably, New England has relied disproportionately on federal research spending, with federal agencies providing 68 cents of every research dollar spent by New England universities, compared with 59 cents nationally. New England state and local governments pitch in about 2 cents per dollar spent on university research, compared with 8 cents nationally.

- New England unemployment averages 7.1 percent for the year, compared with 5.9 percent for the nation; more than 50 Massachusetts manufacturing plants close.

### 1972

- New England state colleges join NEBHE's Regional Student Program.
- NEBHE issues the first of two reports citing the



need for a regional veterinary school in New England; Tufts University School of Veterinary Medicine opens seven years later.

- Members of New England's congressional delegation establish professionally staffed Congressional Caucus and Research Office. The office would be disbanded in the mid-1980s.
- Congress passes Higher Education Amendments, introducing



Basic Educational Opportunity Grants — later renamed Pell Grants — as the chief source of federal aid geared to lower-income families.



## STINGY STATE SUPPORT: A HISTORY

### State Appropriations for Higher Education Operating Expenses: Fiscal 1960 - Fiscal 1995

(Dollars in thousands)

	1960	1965	1970	1975	1980	1985	1990	1995
Connecticut	\$12,273	\$19,706	\$80,270	\$135,247	\$226,371	\$302,931	\$511,567	\$500,315
Maine	\$3,356	\$9,709	\$25,984	\$43,912	\$57,336	\$91,311	\$173,534	\$173,020
Massachusetts*	\$12,167	\$28,415	\$85,278	\$209,647	\$314,929	\$641,844	\$815,996	\$902,934
New Hampshire	\$3,973	\$5,104	\$10,685	\$19,106	\$29,806	\$42,630	\$69,035	\$85,324
Rhode Island**	\$4,477	\$10,283	\$28,935	\$47,036	\$71,725	\$96,051	\$128,513	\$125,034
Vermont	\$3,264	\$5,445	\$13,532	\$20,120	\$27,062	\$41,763	\$57,596	\$53,222
New England	\$39,510	\$78,662	\$244,684	\$475,068	\$727,229	\$1,216,530	\$1,756,241	\$1,839,849
United States	\$1,399,904	\$2,441,506	\$6,191,467	\$11,310,486	\$19,262,439	\$28,644,564	\$39,187,329	\$42,821,037
New England as % of U.S.	2.8%	3.2%	4.0%	4.2%	3.8%	4.2%	4.5%	4.3%

\* Massachusetts 1995 figure not comparable.

\*\* Rhode Island data based on revised calculations starting in 1985.

Source: Center for Higher Education, Illinois State University

As the costs of Medicaid, public schools and correctional facilities climb skyward, higher education faces an uphill battle in statehouses from coast to coast. But nowhere have public colleges and universities been as consistently underfunded as in New England. One explanation: The region has been dominated by private institutions, which account for more than 48 percent of New England's college enrollment, compared with 22 percent nationally. In fiscal 1995, New Englanders will direct an average of \$139 per capita toward state tax support of higher education, compared with \$166 nationally. Rhode Island, Connecticut, Vermont and New Hampshire rank 47th through 50th in state support of higher education per \$1,000 of personal income. Massachusetts ranks 44th, and Maine ranks 32nd. The low appropriations have translated directly into high tuition and fees. In academic year 1993-94, New England's public four-year institutions charged about \$1,400 more in average tuition and fees than public four-year institutions nationally.

relatively tranquil environment — putting aside Sen. Joseph McCarthy's efforts to weed out academic undesirables — has become an arena in which many of our larger dilemmas are played out dramatically, if in miniature.

At the same time, new information technologies provide New England's public and independent institutions with unprecedented opportunities for collaboration. In this too, NEBHE has brought together autonomous institutions in an alliance for educational

progress with its recently formed Regional Commission on Telecommunications and Distance Learning.

As we acknowledge the past 40 years, let us dedicate ourselves to the next two score with an energy and a faith large enough to ensure that the promise of the New England Higher Education Compact's Article I will continue to be realized and cherished.

*Andrew G. De Rocco is the commissioner of higher education in Connecticut and chairman of NEBHE.*

- New Hampshire creates School for Lifelong Learning — later renamed College for Lifelong Learning — as a unit of the public university system geared to adults.

### 1973

- Cheit finds some improvement in financial condition of higher education.
- A nine-member advisory board is formed to advise NEBHE on Regional Student Program matters.



- In the face of sharply rising oil prices, New England governors meet with Eastern Canadian premiers to discuss energy issues, signaling the beginning of regular meetings among the leaders.

- Pentagon announces plans to close major naval facilities in Rhode Island.
- Maine Senate Majority Leader Bennett D. Katz assumes NEBHE chairmanship.

### 1974

- NEBHE receives support from the U.S. Public Health Service to study graduate-level and continuing education in nursing, as well as the region's manpower needs in optometry, osteopathy and podiatry.









1955 - 1995

# Higher Education: Foundation for Economic Development in Connecticut

*Connecticut's future depends on knowledge workers.*

**William J. Cibes Jr.**

**A**lthough faculty members may sometimes decry the association of the Ivory Tower with such worldly activities as economic development, this relationship has been recognized for more than a century — and is more critical now than ever before.

Since the land-grant legislation of the 1860s, it has been expected that some public universities in every state will include in their missions the promotion of “the liberal and practical education of the industrial classes in the several pursuits and professions of life.” In the 1880s, agricultural experiment stations were established to support the research mission of “agricultural and mechanical” colleges and other land-grant institutions. By 1914, deployment of knowledge throughout the mainly agriculture-based economy was aided by federal support of the cooperative extension service.

During the past 40 years, Connecticut public higher education has grown in fits and starts, amid a growing recognition that contemporary economic development depends on the human resource base provided by postsecondary education.

That recognition produced tangible investment in public higher education in the 1960s. The combina-

tion of post-Sputnik emphasis on science education, a growing defense manufacturing sector in need of educated manpower, massive numbers of college-age Baby Boomers and the availability of financial resources led Connecticut to launch an unusually large number of public higher education initiatives during that decade.

The state absorbed the existing community-based two-year colleges in 1965, when necessary funding proved to exceed the taxing capacity of local governments. A state technical college system was created in 1967. Higher education authorities were then authorized in 1969 to create additional colleges for underserved regions of the state. The primary responsibilities of these regional community and technical colleges included the provision of “programs of occupational, vocational, technical and technological and career education designed to provide training for immediate employment, job retraining or upgrading of skills to meet ... manpower needs.”

In addition, in 1965, the four-year state colleges, with a tradition of teacher education, were transferred from the jurisdiction of the state Board of Education to a new, separate Board of Trustees, in recognition that their mission had expanded to include other “career programs.”

- NEBHE links nearly 70 academic and public libraries through the New England Library Information Network, and provides on-line bibliographic searches through its Northeast Academic Science Information Center.

- Boston School Committee rejects court-ordered busing plan for desegregation, leading to two years of racial violence in the region's largest city.



- Economist Rudolph Hardy proposes creation of a New England Assembly with authority to conduct nationwide planning.

- Congress establishes National Center for Education Statistics.

## 1975

- New England suffers deep recession, with regional unemployment averaging 10.3 percent. The U.S. figure is 8.5 percent.

- Women represent 45 percent of U.S. college enrollment and hold 5 percent of college presidencies.





In recognition of the importance of biomedical research, the research activities of the University of Connecticut Health Center were greatly expanded with the construction of a major new medical center.

But while the 1960s was a decade of expansion of state services, the high hopes of those who supported public higher education were to be dampened in the 1970s and thereafter by fiscal reality. Even when sufficient state revenue was available, competition for public dollars for other policy goals like crime control and health care often meant that operational and capital funding for the newly created and expanded state system was less than what public colleges and universities required to respond to the needs of the economy.

For example, in an effort to respond to drug-related crime and gang violence, the Connecticut General Assembly since 1980 has provided dramatically higher appropriations for prisons, while there has been only modest growth in state support for higher education. In fiscal 1981, the state appropriated about \$50 million for the four-year state colleges (excluding the University of Connecticut) and about \$48 million for the Department of Corrections. In fiscal 1995, the state appropriation for the successor system to the four-year state colleges has doubled to \$96 million, while the appropriation for corrections has mushroomed to \$413 million.

Although the boom years of the mid-1980s provided a partial respite to the pressures for austerity, since 1989, New England's deep recession and slow recovery have once again put severe pressure on the state's support for higher education.

All is not doom and gloom, however. There have been some notable achievements on the margin during the past decade. For example:

- In 1983, the four-year state colleges were granted university status, and their missions were broadened to include enlarged support for Connecticut's economy.
- In the 1980s, the state Department of Higher Education began awarding grants for high-technology research at both public and private higher education institutions. After 1991, the grant programs were continued through Connecticut Innovations Inc., a

quasi-public agency associated with the state Department of Economic Development. In fiscal 1995, Connecticut Innovations funded a record \$11.5 million in university research and development.

- The state provided capital grants and operating expenses for the development of a technology park at the University of Connecticut to serve as the site of various high-tech institutes associated with UConn, as well as spinoff private enterprises. After some start-up difficulties, the park is moving forward.
- The state Department of Economic Development provided support for the development of Science Park in New Haven to facilitate technology transfer from Yale University to the private sector.
- The state extended tax credits to corporations that invested in R&D at universities in Connecticut.
- Centers of Excellence and various high-technology institutes were funded at the University of Connecticut and in the Connecticut State University System. The Institute for Industrial and Engineering Technology at Central Connecticut State University, and the Environmental Research and Precision Manufacturing institutes at the University of Connecticut are now providing services to Connecticut businesses.
- The state has granted near-autonomy to the three constituent units of higher education — the University of Connecticut, the Connecticut State University System and community-technical colleges — so that the colleges and universities have the discretion to allocate resources independent of political pressure.

**N**ow, as we look to the future, there is a growing understanding of the crucial role that higher education plays in economic development. In 1993, the governor and General Assembly appointed a bipartisan Progress Council to develop a vision for the Connecticut of 2010. The council, comprised of leaders from throughout the state, noted in its preliminary report of June 1994 that the future growth of Connecticut's economy depends on citizens who are able to "embrace and master change." Specifici-

- Grants account for 80 percent of federal student aid, while loans account for 17 percent; over the following 15 years, the balance would tip significantly toward loans.
- Robert W. Eisenmenger, first vice president of the Federal Reserve Bank of Boston, assumes NEBHE chairmanship.

## 1976

- Congress approves demonstration program to promote delivery of health, education and public service

information via telecommunications.

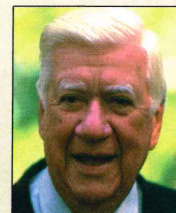
- U.S. college enrollment stands at 11,012,137.

## 1977

- First wave of New England colleges and universities begin divesting endowment funds from companies that do business in South Africa. Within a decade, more than 30 New England institutions would have divested more than \$200 million. Most would reverse the policy with

the dismantling of apartheid in 1991.

- Massachusetts Democratic Congressman Thomas P. O'Neill Jr. becomes speaker of the U.S. House of Representatives, a post he would hold for 10 years.

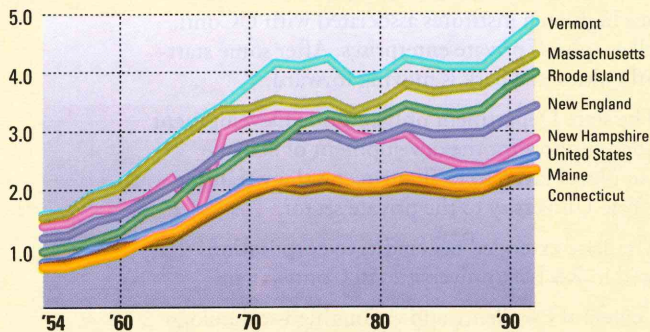


- Bay State executives form Massachusetts High Technology Council to lobby against state policies they consider hostile to business.



## HIGHER EDUCATION ECONOMY

### Current Fund Expenditures of Colleges and Universities as a Percent of Gross State/Domestic Product



Source: Thomas G. Mortenson

Higher education has a bigger economic impact in New England than elsewhere. Exhibit A: While current fund expenditures at U.S. higher education institutions account for 2.6 percent of U.S. gross domestic product, expenditures by Vermont institutions account for 4.8 percent of gross state product. Also well above the U.S. average are: Mas-

sachusetts (4.3 percent), Rhode Island (3.9 percent) and New Hampshire (2.8 percent.) Moreover, the proportion of economic activity provided directly by higher education is rising in every New England state, except New Hampshire. Between 1977 and 1991, higher education's share of New Hampshire's gross state product declined by 28 percent.

cally, Connecticut's future "will depend on the educational attainment of all its people. ... Connecticut's citizens must recognize the pivotal role of education in addressing the challenges facing our state."

The Connecticut Economic Conference Board, a nonpartisan group of economists appointed by the governor and legislative leaders, recently worked with the Progress Council to develop a strategic plan for economic development in the state. In conjunction with the consulting firm of DRI/McGraw Hill, business

leaders and state agencies, the panel of economists concluded that growth in Connecticut is likely to occur in six critical "clusters" — aerospace and advanced manufacturing; business services; financial services; communications, information and education; health and biomedical industries; and tourism and entertainment.

Further analysis concluded that certain foundations are required for economic development in each cluster. Not surprisingly, higher education plays a crucial role in each of those foundations, including:

- ◆ discovering, developing and deploying technology;
- ◆ providing advanced skills and retraining for Connecticut's future workforce;
- ◆ developing and building an advanced technical infrastructure for telecommunications; and
- ◆ enhancing the "quality of life" for Connecticut residents — an elusive concept surely based on a civilized society to which colleges and universities are important contributors.

New England's economic future depends on "knowledge workers" who add value through their work by applying knowledge and analytical skills to problems. As management expert Peter Drucker observed recently in *The Atlantic*, "the comparative advantage that now counts is the application of knowledge."

The new jobs for knowledge workers, according to Drucker, "require a good deal of formal education and the ability to acquire and to apply theoretical and analytical knowledge. They require a different approach to work and a different mindset. Above all, they require a habit of continuous learning. ... Increasingly, an educated person will be somebody who has learned *how to learn*, and who continues learning, especially by formal education, throughout his or her lifetime."

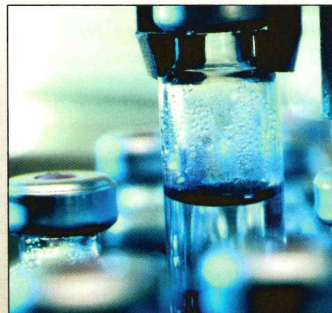
We in New England higher education must demonstrate that the contribution we make to economic development — by preparing knowledge workers who know how to learn — is indispensable.

*William J. Cibes is the president of the Connecticut State University System.*

- Rhode Island state Senate President John C. Revens Jr., assumes NEBHE chairmanship, and appoints John C. Hoy president.

### 1978

- Biogen Inc. is founded in Massachusetts. By 1994, the state would host more than 150 biotechnology companies.
- In response to state budgetary concerns, a 25 percent tuition surcharge on NEBHE Regional Student Program participants is initiated.



- Caucus of New England State Legislatures is established.
- Price of postage stamp rises to 15 cents.

### 1979

- NEBHE creates Commission on Higher Education and the Economy of New England, comprised of banking and high-tech executives, college presidents, labor officials, economists and publishers.
- U.S. Department of Education is established as cabinet-level agency, with Shirley M. Hufstедler as first secretary.
- For the first time, women outnumber men on U.S. college campuses.
- Number of high school graduates begins 15-year decline.



*Bill Nave  
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kids from  
drowning.*



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lifeguard— he's a  
teacher. But to the  
kids he's reached,  
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1955 - 1995

# Is Maine Part of New England Higher Education?

*No, but you can get there from here.*

**J. Michael Orenduff**

**I**t is hardly surprising that the New England Board of Higher Education is the nation's leading interstate compact. After all, American higher education was invented in New England. Private higher education began at Harvard more than 350 years ago, and public higher education sprang up just down the road in Framingham, when Horace Mann's first "normal school" opened in 1839. As we approach the third millennium, Greater Boston remains the hub of higher education, and Maine has benefited from being one of its spokes.

Before the founding of NEBHE in 1955, the most important event in the history of higher education in Maine was, surprisingly, the Missouri Compromise.

Had it not been for that ill-fated attempt to maintain the Union by balancing pro- and anti-slavery states, students from Bangor today would be paying resident tuition at the University of Massachusetts, and Orono truly would be the sleepy village on the Stillwater River that some argue it still is.

But Maine became a state. An interesting, if perhaps irreverent, question would be: "Did we become a New England state?"

Maine covers half of New England's land mass, but contains only 9 percent of the region's population. In this way, we resemble New Mexico or Idaho

more than we do Rhode Island or even New Hampshire. We also resemble the West with regard to the type of higher education we offer. More than 70 percent of all higher education enrollment in Maine is in public institutions — the highest percentage in New England.

Maine has no major private research institution, unlike New Hampshire (Dartmouth College), Massachusetts (Harvard University, the Massachusetts Institute of Technology, Boston University, et al.), Connecticut (Yale University) and Rhode Island (Brown University). (I don't know how to classify Vermont; it has a higher percentage of students in private institutions than does Maine, and the University of Vermont seems at times to be more a private university than a public one.)

In Maine, the economic engine of higher education is powered mostly by the public University of Maine System. But Maine is also the poorest state in New England.

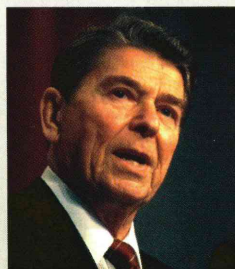
With no Yale to garner research funds, no Dartmouth to attract hoards of wealthy out-of-state students, no Harvard to mount 10-figure capital campaigns and no MIT to spin off high-tech industry, we must rely on funding from a state government that raises its revenue from taxing people whose per-capita income is less than \$19,000 annually.

## THE EIGHTIES

### 1980

- High-technology executives in Massachusetts help push through Proposition 2 1/2, a sweeping referendum capping property taxes. Some communities would later override the law in an effort to keep schools afloat.

- Ronald Reagan is elected president, ushering in era of administration calls for cuts in federal spending on higher education and scientific research.



- Quinebaug Valley Community College President Robert E. Miller assumes NEBHE chairmanship.

### 1981

- NEBHE publishes *Business and Academia: Partners in New England's Economic Renewal*, the first in a series of three books on New England higher education and the regional economy. *New England's Vital Resource: The Labor Force* and



It is therefore not surprising that Maine ranks last among the New England states in the percentage of residents who have college degrees, last in the average salary paid to faculty and a distant last in research funding.

Only about 19 percent of Maine residents age 25 and older hold at least a bachelor's degree, compared with 27 percent in Connecticut and Massachusetts, 24 percent in New Hampshire and Vermont, and 21 percent in Rhode Island.

Furthermore, Maine universities spent about \$23 million on research in 1992, compared with \$1 billion in Massachusetts, \$341 million in Connecticut, \$97 million in Rhode Island, \$87 million in New Hampshire and \$50 million in Vermont.

**D**id I say we benefited from NEBHE? Despite these dismal figures, Maine would be even further marginalized were it not for our association with New England higher education through NEBHE. In everything from the Regional Student Program to the Equity and Pluralism Action Program, as well as the Canadian Exchange Program and the recently established Regional Commission on Telecommunications and Distance Learning, Maine reaps a bountiful harvest from our association with our more prosperous neighbors.

But we are not content to be the poor country cousins. Maine residents are rightly celebrated for their resourcefulness.

As NEBHE celebrates its 40th anniversary, the University of Maine System observes its 25th year, now as a fully realized system of public higher education serving the state with a range of institutions, each with a carefully focused mission: the land-grant, seagrant University of Maine; the metropolitan, comprehensive University of Southern Maine; the residential, liberal arts University of Maine at Farmington; four baccalaureate regional universities; and a community college.

To address the challenges of access in our large, sparsely populated state, in the last several years, we have achieved a national leadership position in dis-

tance education through telecommunications, which will enable us to make a great leap forward in delivering higher education to Maine residents. We were the first state in New England to link all public colleges with interactive video.

We are now taking our telemediated instruction directly into homes through cable television. A pending project will link every public high school in Maine, enabling the schools to share resources such as physics teachers, permitting the university to provide graduate programs for teachers at their job sites or after hours, and allowing school districts to share training and administrative costs. Courses are also being delivered through other technologies such as the Internet.

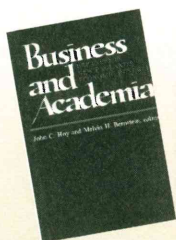
Technological change will not be limited to the classroom. Students in the University of Maine System can now access their records 24 hours a day by touch-tone phone, receiving grade reports before they are mailed and billing balances before they are due. In the near future, I expect to see students register for courses by using ATM-like machines in shopping malls.

**M**aine is not destined to become wealthier soon. But technology will enable us to partially overcome the limits imposed by our state's geography and economy. And while we cannot and would not change the former, the University of Maine System will lead the way in changing the latter.

When NEBHE celebrates its golden anniversary in 2005, I fully expect Maine to have entered New England at least insofar as educational attainment is concerned. Of course, I also expect New England to comprise New Brunswick and the other Maritime provinces by that time. It should be an interesting decade.

---

*J. Michael Orenduff is the chancellor of the University of Maine System.*



*Financing Higher Education: The Public Investment* are published a year later.

- A NEBHE survey finds that fewer than half of New England leaders of government, higher education, business and labor view higher education as "above average" or "outstanding" in meeting the labor force needs of the region's industries.

- Reagan administration cuts funding of New England Regional Commis-

sion and New England River Basins Commission.

- Yale University, the city of New Haven, the state of Connecticut and Olin Corp., establish Science Park



Development Corp. in an unprecedented joint effort to lure high-tech and biotech firms to New Haven.

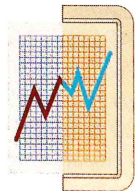
- Tuition and mandatory fees at New England's private four-year colleges average \$4,874, compared with \$3,709 nationally. Tuition and mandatory fees at the region's public four-year colleges average \$1,019, compared with \$819 nationally.



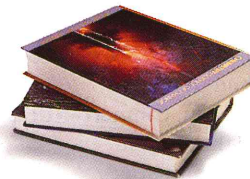
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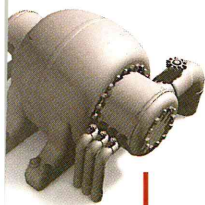




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1955 - 1995

# A Crusade for Rhode Island's Future

*A model program aims at children young enough to believe they can succeed.*

**Americo W. Petrocelli**

**F**orty years ago, New England was a genuine national powerhouse with big-time cities, big-time manufacturing and a big-time economy. Boston was America's 10th largest city; Providence, Worcester, Hartford, New Haven, Springfield, Bridgeport, Cambridge, Fall River and New Bedford all ranked among the nation's 100 most populous metropolises, well ahead of such frontier outposts as Phoenix, Ariz., then ranked 98th.

Today, Phoenix is the nation's eighth largest city; Boston is 20th. The only other New England city in the top 100 is Worcester, occupying Phoenix's old spot at 98th.

New England's economy has become a global economy. Manufacturing continues its long postwar decline. The end of the Cold War has further diminished the region's economic base. Middle-class prosperity and the new mobility brought by such developments as the interstate highway system, convenient air travel and even such innovations as air conditioning have all played a role in the flight of our better-off citizens to balmy climes.

Left behind is an increasingly poor population lacking skills for the kinds of jobs that remain. In 1954, one hourly wage earner could provide an adequate income to keep an entire family in the middle class. No longer.

Very few of those kinds of jobs exist in today's New England, and a college education is essential to enable families to earn their way into the middle class.

But how well are we prepared to educate new workers and maintain a reasonable level of prosperity for the region? What do our future college recruits look like? I wish that the demographic trends could offer some hope, but unfortunately, much of the news is rather sobering.

The United Way of Southeastern New England recently reported that more than half of the children born in Rhode Island in 1993 were born either to a single parent, a teenage mother, a mother with less than a high school education or a mother who lacks medical insurance — all factors that put the child at risk educationally. If we are having difficulty keeping our higher education institutions filled today, imagine the problems when these children reach college age.

Fortunately, New England has a wealth of outstanding colleges and universities with a long history of visionary leadership. It's not too late to intervene in the lives of these youngsters, so they may be prepared to attend our colleges and universities and become the kind of working, taxpaying consumers needed to keep our economy growing. The Rhode Island Children's Crusade provides a good example of the kind of intervention that is needed. We take youngsters beginning

## 1982

- NEBHE's Commission on Higher Education and the Economy releases *A Threat to Excellence*, calling for strengthening public education through a variety of partnerships among New England colleges, secondary schools and businesses.
- New England Education Loan Marketing Corp. (Nellie Mae) is chartered as first regional secondary market in the United States.
- NEBHE works with New England congressional delegation to help pass

Small Business Innovation Development Act, setting aside federal research funds for small business.

- New England unemployment averages 7.8 percent, as recession pushes U.S. jobless rate to 40-year high of 9.7 percent.



hotbed of software publishing.

- Mitchell Kapor launches Lotus Development Corp., as Cambridge, Mass., becomes a

## 1983

- NEBHE publishes *Higher Education Telecommunications: A New England Policy Imperative*, urging that New England adopt a regional policy to coordinate and bolster lagging educational telecommunications.



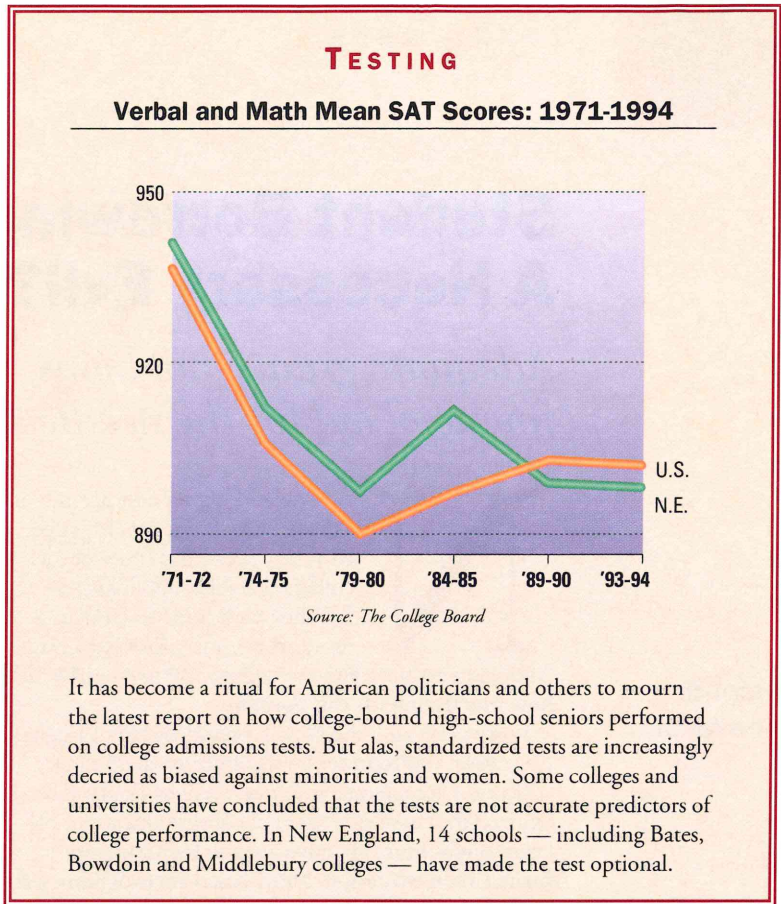


in the third grade, ask them to sign a pledge to stay in school, work hard and avoid substance abuse, pregnancy and unlawful activity — the kind of behaviors that lead to dropping out of high school. We provide mentors in a community-based setting through Crusader Clubs, pen pals and phone pals. We find tutorial assistance for those who need it. And we seek to ignite their aspirations for a higher education at an age when they are still young enough to believe that they can succeed.

For those who graduate from high school and gain admission to college by virtue of their own abilities, but are financially disadvantaged, the Crusade offers scholarships equal to the cost of tuition at Rhode Island's public institutions of higher education at the time of the student's graduation, but portable to any postsecondary institution, public or private. In just five years, a \$4.3 million endowment has been established for scholarship purposes, and the effort continues. In addition, just this past year, the Crusade earned an AmeriCorps grant that is expected to total nearly \$1.8 million to help expand student mentoring programs.

It has been particularly gratifying to see the interest the Crusade has sparked throughout the national higher education community. So far, 42 U.S. colleges and universities have stepped up to the plate to join the Crusade Scholarship Collaborative, offering scholarships to Crusaders with a total value estimated at more than \$41 million. This collaborative includes all public and independent institutions and eight trade schools in Rhode Island. Other New England institutions that have joined include: Bates, Bowdoin, Colby, Connecticut, Dartmouth, Middlebury, Mount Holyoke, Smith, Trinity and Wellesley colleges, Harvard University and the Massachusetts Institute of Technology.

The philosophy behind the Crusade is not new. Programs with similar features have achieved remarkable success in preparing youngsters for college, trade schools or union apprenticeship programs. What is novel about our approach is that the Crusade is not a pilot program — it serves the entire state. Four classes of Crusaders — 10,000 students in all — are now enrolled in grades 3 through 6. The students repre-



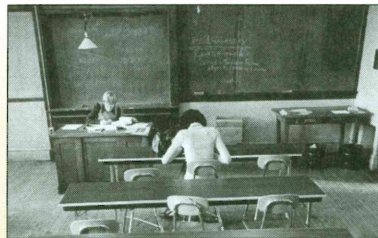
It has become a ritual for American politicians and others to mourn the latest report on how college-bound high-school seniors performed on college admissions tests. But alas, standardized tests are increasingly decried as biased against minorities and women. Some colleges and universities have concluded that the tests are not accurate predictors of college performance. In New England, 14 schools — including Bates, Bowdoin and Middlebury colleges — have made the test optional.

sent every community in the state; nearly half of them are economically disadvantaged.

This is one way higher education can ensure the reemergence of New England as a center of prosperity and hope. Perhaps someday we may even attract some of those folks back from Phoenix to share in our renaissance. Beaches, skiing and economic opportunity is a pretty unbeatable combination.

*Americo W. Petrocelli is the commissioner of higher education in Rhode Island.*

- National Commission on Excellence in Education publishes *A Nation at Risk*, warning of mediocrity in public schools and leading to stepped-up school reform efforts across the country.
- NEBHE and the Caucus of New England State Legislatures earn support from the U.S. Department of Education to begin a series of legislative briefings aimed at providing New England lawmakers with information on higher education and the economy. For a time, the states would dramatically increase public investment in higher education.



- Congress authorizes challenge grants aimed at giving colleges an incentive to seek alternative sources of funding.
- Rhode Island state Sen. Robert J. McKenna assumes NEBHE chairmanship.

## 1984

- NEBHE publishes *Renewing Excellence*, revealing, among other things, that New England legislators see higher education playing an important role in retraining workers for high-demand occupations.
- Rhode Island voters reject Greenhouse Compact, a comprehensive economic development plan developed by Ira Magaziner and others to encourage business expansion, research and job growth in Rhode Island.





# Student Borrowing: A Necessary Evil?

*Adequate grants, not loans, must be the foundation of financial aid for the neediest students.*

**Daniel S.  
Cheever Jr.**

**N**ew England higher education is at a crossroads. Students are expected to pay more and more of their college costs through loans. So far, they have done so, and, as a result, more and more New England students have gone to college. But we need to ask how much students can borrow.

Forty years ago, the New England Board of Higher Education was founded in recognition that higher education is a regional resource. As New England recognized the economic value of college education, colleges sought more effective ways to help students finance their education. Need-based aid programs, particularly loan programs, emerged to supplement existing institutional scholarships and government grants.

Massachusetts led the way in 1956, when college presidents and bankers joined to establish the Massachusetts Higher Education Assistance Corp. (now American Student Assistance), a nonprofit guarantor of bank loans for students. Other New England states soon developed programs to provide access to loan capital. Maine's agency was founded in 1957, New Hampshire's in 1962, Vermont's in 1965, Connecticut's in 1966, and Rhode Island's in 1977.

The federal government also became a partner in the region's efforts. In 1958, the National Defense

Education Act provided low-interest loans for some college students. Seven years later, the federal government expanded financial assistance with the Higher Education Act. That legislation, as amended, still governs major federal aid programs today. In 1994, those programs made available \$24 billion in loan capital from banks to students with guarantees from the agencies in each state.

**W**hat's the problem? Students and their families are borrowing more money than ever before to pay for college. Terry Hartle, former education aide to U.S. Sen. Edward M. Kennedy and now vice president of the American Council on Education, noted recently that of the \$183 billion borrowed in the nearly 30-year history of the federal loan program, 22 percent was borrowed in the past two years.

Here's why. According to higher education experts Lawrence Gladieux and Arthur Hauptman: Since 1980, the cost of attendance has ballooned 43 percent for public four-year institutions and 60 percent for private four-year institutions, while total grant aid per full-time equivalent student has grown by only 5 percent and median family income has grown by only 2 percent. College costs have increased far faster than the ability to pay, forcing students and families to



- Congress passes Carl D. Perkins Vocational Education Act, continuing federal support for vocational education and presaging national debate on school-to-work programs.

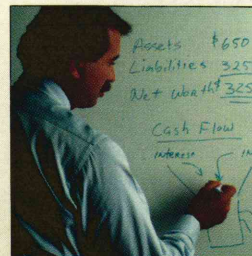
- With support from the Massachusetts Centers of Excellence Corp., Worcester, Mass., begins a major initiative to become a center of the biotechnology industry.

.....  
**1985**

- NEBHE creates New England South African Student Scholarship Program, enabling New England colleges to support Black South African students at "open universities" in South Africa.

- NEBHE, U.S. Education Secretary Terrel Bell and the National Institute of Education cosponsor Northeastern Regional Conference on Quality in American Higher Education, bringing together governors, legislators,

college presidents and others to push for higher quality in college curricula, teaching and assessment.





borrow. New England reflects the national trend. Since 1970, each New England state has seen loan volume grow dramatically; indeed, volume has doubled in the past four years alone:

	1970	1980	1990	1994
Connecticut	\$25m	\$149m	\$118m	\$157m
Maine	N.A.	19m	42m	121m
Massachusetts	20m	253m	522m	1.1b
New Hampshire	2m	22m	36m	110m
Rhode Island	5m	27m	44m	126m
Vermont	0.3m	12m	35m	100m
<b>New England</b>	<b>\$52.3m</b>	<b>\$482m</b>	<b>\$797m</b>	<b>\$1.7b</b>

What does this increase in borrowing mean? Are substantially more students borrowing today than only a few years ago? Or are the same number of students borrowing much more? What is an acceptable level of student debt?

David Longanecker, the U.S. Department of Education's assistant secretary for postsecondary education, recently remarked that: "Just because there's more borrowing doesn't mean it's bad."

Jennifer Beck is among the many students who would disagree. She got her undergraduate and master's degrees with the help of \$50,000 in student loans. Her monthly repayment is \$600 — almost 20 percent of her pay.

True, Jennifer Beck's debt is high. Median debt today for bachelor's degree recipients is estimated at \$12,500, and loan repayment takes about 5.5 percent of the typical graduate's gross income. But that's almost double the percentage of only five years ago. And even if student debt is manageable today, escalating college costs, dwindling grants and stagnant family income mean students must borrow even more tomorrow. At some point, the level of debt will become unmanageable for many.

There is also the question of one generation's responsibility to the next. "The huge increase in student borrowing raises serious moral issues that we should not ignore," says Hartle. "The United States has

decided to shift the burden of financing higher education to students themselves. The social compact that assumed the adult generation would pay for the college education of the next generation has been shattered."

Thus, New England faces important policy choices. Will the region's colleges continue to raise tuition at twice the rate of inflation and three times the rate of growth in family income? Or will some institutions lead the way to new models of higher education, which slow down this rate of increase, much as some hospitals have begun to do?

The greater use of technology, more collaboration among institutions, fewer administrative services, changes in traditional academic calendars and even changes in workloads or employee benefits are all up for thoughtful consideration by New England colleges.

So also are imaginative proposals to provide new sources of money for higher education. Several states have implemented prepaid tuition programs that will yield sufficient money to pay tuition at participating colleges when a student is ready to attend. The idea is attractive, but risky; participating schools generally have to agree to limit tuition increases to no more than 2 percent above inflation, a worthy goal but difficult to promise for the next 10 or 15 years.

President Clinton's proposal for the tax deductibility of college tuition is yet another source of help. But the proposal tilts toward families with higher incomes and leaves the poorest families farther behind. For example, Clinton's \$3,100 tax benefit for a family earning \$100,000 would be greater than the basic Pell Grant of \$2,300 for our neediest families.

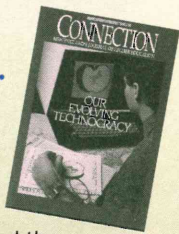
It will be easier to consider innovative proposals such as these if we first can reaffirm the following basic principles to guide decision-making.

First, access to postsecondary education must remain one of New England's highest priorities. Study after study confirms that a college graduate will earn significantly more over his or her lifetime than a high school graduate — about \$800,000 more on average. The college graduate will contribute to the region's economy and quality of life through better

- Tufts University President Jean Mayer assumes NEBHE chairmanship.

## 1986

- NEBHE begins publishing the nation's only regional journal on higher education and the economy, *CONNECTION: NEW ENGLAND'S JOURNAL OF HIGHER EDUCATION AND ECONOMIC DEVELOPMENT*.
- Reagan defense buildup reaches peak.



- Tuition and mandatory fees at New England's private four-year colleges average \$7,739, compared with \$5,793 nationally. Tuition and mandatory fees at the region's public four-year colleges average \$1,590, compared with \$1,137 nationally.

## 1987

- With support from the W.K. Kellogg Foundation, NEBHE and the New England Center for Continuing Education ask leaders of business,

government and education to identify issues that will be critical to the region's prosperity. The resulting *Future of New England Leadership Survey Report* warns of a shortage of skilled labor.

- NEBHE publishes *Economic Competitiveness and International Knowledge and The Impact of Globalization on Higher Education*,

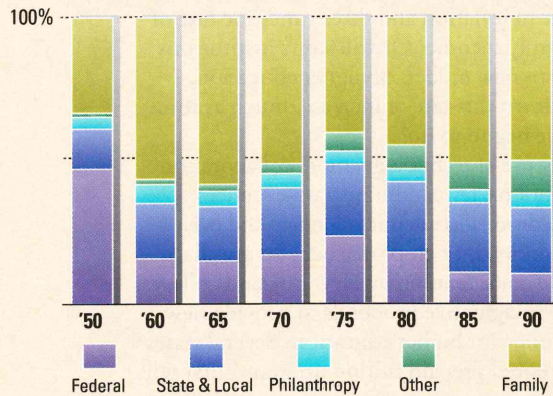
exploring links between U.S. competitiveness and international aspects of higher education.





## SHIFTING BURDEN

### Responsibilities for Financing Postsecondary Education 1950-1990



The federal share of college financing dropped from more than 45 percent in 1950, the heyday of the G.I. Bill, to about 10 percent in 1990, the aftermath of the Reagan administration's retreat from higher education. Much of the burden has been shifted to students and their families.

#### Responsibilities for Financing Postsecondary Education: Public Institutions

	1950	1960	1965	1970	1975	1980	1985	1990
Federal	34.7%	14.8%	12.5%	16.0%	23.2%	16.3%	9.7%	9.3%
State & Local	22.7%	29.8%	29.3%	32.1%	33.3%	33.0%	32.4%	30.7%
Philanthropy	1.2%	2.2%	1.5%	2.0%	1.9%	2.1%	2.5%	3.0%
Other	3.5%	3.9%	4.0%	5.9%	5.4%	7.0%	7.9%	9.9%
Family	37.9%	49.3%	53.0%	44.9%	35.3%	40.8%	46.9%	46.6%
Parent	25.6%	38.0%	40.6%	29.4%	18.4%	19.3%	25.2%	26.7%
Student	12.3%	11.4%	12.4%	15.5%	16.9%	21.5%	21.7%	19.9%

#### Responsibilities for Financing Higher Education: Private Institutions

	1950	1960	1965	1970	1975	1980	1985	1990
Federal	60.9%	18.4%	19.4%	20.3%	24.2%	22.2%	15.5%	15.3%
State & Local	3.6%	3.4%	3.3%	4.0%	4.3%	4.3%	4.0%	4.6%
Philanthropy	9.6%	14.0%	12.9%	13.0%	12.3%	11.6%	12.1%	11.8%
Other	3.8%	4.9%	4.8%	8.9%	10.7%	12.4%	13.5%	13.7%
Family	22.1%	59.3%	59.9%	55.4%	47.4%	47.9%	54.0%	53.7%
Parent	11.8%	50.8%	51.5%	44.7%	35.6%	31.0%	38.3%	39.5%
Student	10.3%	8.5%	8.3%	10.8%	11.8%	16.9%	15.6%	14.3%

Source: Arthur M. Hauptman

employment, the payment of more state and local taxes and educated participation in civic life.

Second, taxpayers must recognize the value of public investment in higher education and support adequate state funding of it. New England's education leaders and opinion-makers must continue to press their case because state investment is exactly that — an investment that makes economic and civic sense. It will be better if all taxpayers pay a little more to keep college affordable than if students and their families must borrow much more, and some, discouraged, never apply, while others default on their loans.

Third, adequate grant or scholarship funds, not loans, must be the foundation of every financial aid package for our neediest students. The shift from grants to loans during the past 20 years has harmed our poorest families most. New England deprives itself of the talent and ability of thousands of citizens if it denies them any realistic hope of financing a college education, because grants are too low and the loan burden becomes too high. That's why current Republican proposals to increase the debt burden even further by eliminating the federal subsidy for deferment of loan interest while students are in school are so shortsighted.

There will be no single solution to the problem of keeping college affordable for all. Like a spider web anchored by its strands to several different branches, maintaining affordability will depend on a commitment to keep open access to all who qualify, a determination by colleges to slow down tuition increases, a willingness of taxpayers to invest in the next generation, an adequate grant program as the foundation for other aid programs, and finally, a continued mix of self-help, student and family borrowing, summer earnings and imaginative proposals for long-term investment for college. Financial aid will continue to be hard to understand and difficult to administer. And it will continue to be essential for New England's future.

*Daniel S. Cheever Jr. is the president of American Student Assistance Corp. and former president of Wheelock College.*

- The stock market crashes.
- A record 25 percent of college freshmen say they plan to pursue careers in business, according to the American Council on Education. By 1992, the number had dropped to 14 percent.

## 1988

- NEBHE publishes *Biomedical Research and Technology: A Prognosis for International Economic Leadership*. The report of NEBHE's Commission on Academic Medical

Centers and the Economy of New England explores the promise of New England's biotechnology industries and issues major recommendations to encourage biotech manufacturing in New England.

- New England's regional unemployment rate dips to an average of 3.1 percent, while the U.S. rate averages 5.5 percent, but economic trouble is around the corner.
- Three-term Massachusetts Gov. Michael Dukakis loses his bid for the presidency against the backdrop of a crashing economy and



state fiscal crisis. Budget woes hit Beacon Hill first, but within two years, all six states are cutting programs, laying off workers and searching for new revenue.





# Education that Works.

Today's jobs, as well as tomorrow's, require more skills and more education to keep up with technology and to remain competitive in the job market. The better paying, more interesting jobs require training beyond high school -- but not necessarily a four year degree.

With programs in over 100 career areas, the Community-Technical Colleges of Connecticut can give you the skills and education you need to get a head start on your future.

All high school graduates are eligible for admission, no SATs are required, and tuition and costs are low. And there is financial aid for qualified students.

Call 1-800-33-CLASS or the Community-Technical College near you to find out why it is --

## A Great Way to Start.

Community-Technical Colleges of Connecticut

Asnuntuck (Enfield)	Middlesex (Middletown)	Quinebaug Valley
Capital (Hartford)	Naugatuck Valley (Waterbury)	(Danielson)
Gateway	Northwestern Connecticut	Three Rivers
(New Haven/North Haven)	(Winsted)	(Norwich/New London)
Housatonic (Bridgeport)	Norwalk	Tunxis (Farmington)
Manchester		





# Minority Participation in New England Higher Education Since the Brown Decision

*Faculty need to appreciate that minorities are capable of excellence in academic achievement.*

**Reginald Wilson**

New England literally led the way in the higher education of U.S. minorities. Alexander Lucias Twilight, the first known Black college student in the United States, graduated from Middlebury College in 1823. New England colleges served as the cradle of the Abolitionist Movement, educating free Blacks and escaped slaves long before it was considered legal or proper in other parts of the country. A steady trickle of well-known and obscure Black scholars graduated from the region's colleges and universities long before Emancipation and well into the 20th century. George Grant, a Black, became an instructor in Harvard's School of Dentistry in 1884. W.E.B. Dubois became the first Black Ph.D. graduate of Harvard in 1896.

Bowdoin and Williams colleges were especially known for regularly recruiting Black students. And some schools gained reputations for educating successive generations of the same Black families.

In the early 20th century, New England's leadership continued. Fritz Pollard, a scholar and football star, graduated from Brown University in 1916.

William Hastie, the nation's first Black federal judge, graduated from Amherst in 1925. Charles Hamilton Houston graduated from Amherst College in 1930, before going on to head Howard Law School, where he taught, among others, Thurgood Marshall.

Gradually, other minority groups found a welcome in New England that in other parts of the country was only grudgingly permitted and sometimes denied. Yet it must be remembered that these persons of color were a rarity in New England, and the racially and culturally homogeneous region looked upon them as exotic curiosities. Indeed, despite the diversity of Connecticut and Massachusetts, the region is still a most homogeneous place, surpassed only by states such as Idaho, the Dakotas and Wyoming.

With passage of the G.I. Bill of Rights in 1944, thousands of minority veterans with vouchers for a free education suddenly became an attractive commodity to the colleges and universities of the region, and minorities were welcomed in numbers never before seen. Ten years later, another revolution: *The Brown v. Board of Education* U.S. Supreme Court decision declared schools segregated by race to be illegal. Although the decision was directed at elementary

- The William T. Grant Foundation's publication of *The Forgotten Half* focuses attention on the inadequacy of school-to-work programs for non-college-bound students.

- Vermont Technical College begins two-way interactive link between its Randolph campus and the North Country Union High School in Newport, marking the beginning of nationally renowned educational telecommunications initiatives in the state.

- University of New Hampshire President Gordon A. Haaland assumes NEBHE chairmanship.



## 1989

- The "miracle" is over. New England unemployment rate rises; personal

income growth falls. Wang, Digital, Data General and Prime Computer announce major layoffs.

- NEBHE issues *Equity and Pluralism: Full Participation of Blacks and Hispanics in New England Higher Education*. The benchmark report of NEBHE's Task Force on Black and Hispanic Student Enrollment and Retention in



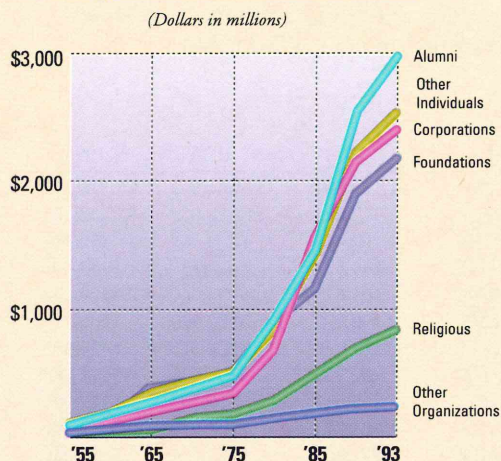


and secondary schools, and mainly affected schools in the South, there was a history of *de facto* segregation of public schools in New England and elsewhere in the North. Moreover, colleges of both the South and the North sensed correctly that they would be next and began recruiting minority students in earnest. Their efforts would soon be pushed along by the Brown II decision, requiring "deliberate speed" in school desegregation; the Civil Rights Act of 1964 banning discrimination in public institutions; and the Pell Grant legislation of 1972 providing grants for low-income students to attend college, many of whom would be minorities.

Now, 40 years after the *Brown* decision, it is time to take stock of minority progress in New England higher education. The picture is decidedly mixed. To begin with, the dramatic changes in public education did not come without a price, as told in agonizing detail by George Metcalf in his book which traces school desegregation from Little Rock to Boston. In its resistance to school desegregation, the Boston School Committee was as defiant as any school district in the South, and its opposition left wounds that have not healed to this day. Fortunately, this extreme was not typical of the rest of the region's reaction to school desegregation.

## GIVING TO HIGHER EDUCATION

### Sources of U.S. Voluntary Support for Higher Education

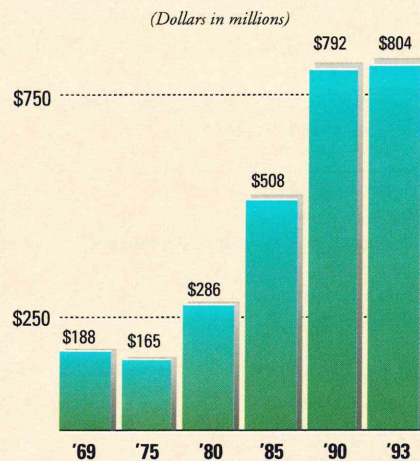


Source: Council for Aid to Education

The education enterprise competes for the charitable dollar with religion, health, the arts, social services and elementary and secondary education.

Public institutions increasingly pursue private philanthropic support. The Bristol Community College Foundation in Massachusetts, for example, set out a 1995 campaign goal of \$250,000. Still, private- and public-sector fundraisers operate in very different worlds. Some independent New England institutions have garnered single gifts as large as \$70 million.

### Rise in New England Voluntary Support

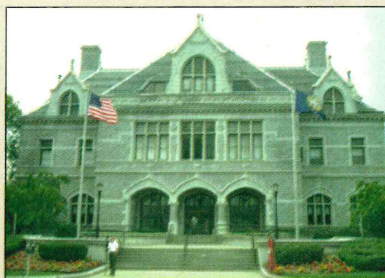


Still, between 1980 and 1992, the African-American share of New England college enrollment rose only slightly from 3.4 percent to 4.4 percent, even as the African-American share of New England's 18- to 24-year-old population rose to 5.5 percent. Moreover, in 1992, the most recent year for which federal figures are available, African-Americans earned less than 2 percent of the more than 3,000 doctorates awarded by New England institutions. Hispanics and other minority groups that were not the principal focus of the *Brown* case have also shown mixed progress in enrollment and degrees.

New England offers 20 major recommendations to ensure greater participation and success among Blacks and Hispanics in New England higher education and the educated workforce.

- Rhode Island launches Children's Crusade, guaranteeing full college scholarships to economically disadvantaged Ocean State students.
- U.S. Sen. George Mitchell, a Democrat from Maine, becomes senate majority leader. Mitchell opts not to seek re-election in 1994.

- Through its Regional Project on the Global Economy and Higher Education in New England, NEBHE briefs state legislators in all six state capitals on the internationalization of higher education and the economy.



- NEBHE issues *Law and the Information Society: Observations, Thoughts and Conclusions about Legal Education, Law Practice and the New England Economy*. The report of a panel of distinguished lawyers, judges, law school deans and business leaders finds that while lawyers have contributed to the region's economy, growth in the legal profession has not worked to curb legal costs, reach more middle class and poor people or ensure professional competence.



## GROWTH IN NEW ENGLAND'S LARGEST ENDOWMENTS

New England institutions control an extraordinary 20 percent of U.S. college endowment dollars. But the bulk of New England's endowment wealth remains concentrated at a handful of institutions. Indeed, 56 percent of the region's college endowment funds are held by just three institutions: Harvard and Yale universities and the Massachusetts Institute of Technology.

**New England Endowments: Market Value at End of Year**  
(Dollars in thousands)

	1955	1975	1985	1993
Harvard University	\$444,000	\$1,152,591	\$2,694,802	\$5,778,258
Yale University	\$245,500	\$517,673	\$1,318,632	\$3,232,305
Massachusetts Institute of Technology	\$51,084	\$402,475	\$770,167	\$1,752,792
Dartmouth College	\$56,142	\$149,572	\$414,137	\$743,700
Brown University	\$30,804	\$91,879	\$223,060	\$590,138
Wellesley College	\$44,300	\$100,977	\$220,429	\$485,115
Smith College	\$22,675	\$81,786	\$222,378	\$435,565
Williams College	\$25,600	\$62,322	\$199,943	\$421,088
Boston College	\$1,650	\$5,413	\$76,544	\$412,300
Boston University	\$8,523	\$26,724	\$107,926	\$342,800
Amherst College	\$36,200	\$77,024	\$168,134	\$327,000
Wesleyan University	\$37,754	\$113,181	\$188,675	\$323,000
Middlebury College	\$10,941	\$31,045	\$128,422	\$313,000
Mount Holyoke College	\$14,140	\$41,364	\$96,757	\$221,093
Tufts University	\$16,038	\$27,881	\$78,277	\$214,774
Northeastern University	\$8,874	\$30,803	\$87,402	\$215,582
Brandeis University	\$1,350	\$32,840	\$107,160	\$196,125
Bowdoin College	\$17,800	\$39,439	\$94,820	\$185,000
Trinity College (Conn.)	\$13,755	\$29,674	\$74,808	\$166,000
College of Holy Cross	N.A.	\$5,571	\$39,663	\$142,000
Above Total	\$1,087,130	\$3,020,234	\$7,312,136	\$16,497,635
New England Total	\$1,152,639	\$3,330,510	\$8,207,387	\$19,258,667
Above as % of New England Total	94.3%	90.7%	89.1%	85.7%
U.S. Total Endowment*	\$3,702,139	\$14,364,534	\$39,916,368	N.A.

\*Figure for 1955 reflects book value.

Source: New England Board of Higher Education

New England's homogeneity has been shattered forever. The region has the fastest-growing minority population in the United States when measured as a share of total population. Minorities are migrating to the region in greater numbers than Whites and have higher birthrates. But partly because few New England institu-

tions are prepared for this change, the rate at which minorities complete four-year college degrees has fallen. If New England institutions do not direct their energies toward seeing minorities through to graduation, the region's educated workforce will suffer.

Some colleges and universities are already addressing this problem. Boston College, for example, has a program for underprepared students called "Options through Education." Each year, 60 freshmen are selected for the program. Prior to their first year, Options students complete a summer workshop that focuses on writing, math, reading and study skills. During their time at Boston College, while on full scholarship, they receive tutoring and monitoring of their academic performance. Nationally, 32 percent of Black students and 41 percent of Hispanics earn four-year degrees within six years of beginning college; the graduation rate for Options students is 92 percent.

In addition, all six New

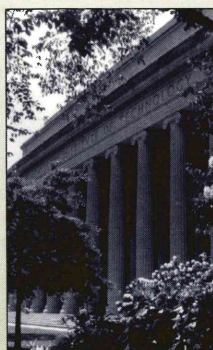
England public land-grant universities, along with Dartmouth College and Northeastern and Brown universities, are participating in the first round of the multimillion-dollar "Compact for Faculty Diversity" program launched last year by the New England

- Tuition surcharge on NEBHE's Regional Student Program is raised to 50 percent.

- Number of New England high school graduates begins sharp decline.

- Boston University wins approval to manage the Chelsea, Mass. public schools, becoming the first private institution to manage a public school system.

- Massachusetts Institute of Technology becomes the first



university ever to be granted more than 100 patents in one year.

- University of Maine at Augusta begins offering courses at remote sites via fiber optic and microwave, inaugurating one of the nation's leading educational telecommunications programs.



- Median salary for U.S. college presidents is \$126,027.





Board of Higher Education and two other regional education agencies — the Southern Regional Education Board and the Western Interstate Commission for Higher Education. These institutions will recruit minority students for graduate study and provide them with the financial and academic support they need to complete Ph.D.s and enter college teaching.

Investment in the higher education of minorities pays off with increased skills in the labor force, more positive attitudes and more taxpaying, rather than tax-consuming, citizens. Yet New England, like the rest of the country, has not got the message.

New England's economy will hinge increasingly on a well-trained workforce. But the cost of a college education doubled between 1980 and 1990, putting training beyond high school out of the reach of many low-income Whites and minorities.

Indeed, many minorities are discouraged from seeking higher education for both financial and academic reasons. I frequently hear reports not of racism, but of "negative mentoring," in which White teachers and counselors advise minority students to lower their educational and career goals because they just don't believe the students can do the work. "Maybe you're aiming too high," the counselors tell the students.

These faculty members can learn to have high expectations of their students and delight in seeing them live up to them. With minorities representing

just under 5 percent of U.S. college faculty — nearly half of them teaching at historically Black colleges — it will be necessary to convince substantial numbers of White faculty to appreciate that minorities are capable of excellence in academic achievement. Educators just have to work harder to help those Blacks and Hispanics who, even 40 years after *Brown*, tend to attend inferior schools, and therefore have not had adequate preparation for demanding academic work.

New England policymakers will have to be convinced that investing in the education of minority students will have enormous payoffs for the regional economy. And colleges and universities will have to be convinced that greater investments in initiatives such as the Compact for Faculty Diversity will have a payoff in increasing the numbers of minority faculty, and thus, increasing the graduation rates of the next generation of minority college students.

New England's past leadership in educating minorities is a record to be proud of. New England can take further pride in redoubling its efforts and commitment to lead minority education in the 21st century. The demographics are different now, but the goal is the same: achieving equal educational opportunity.

---

*Reginald Wilson is a senior scholar at the American Council on Education.*

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# New Englanders Changed Admissions ... and Will Need To Again

*Enrollment managers face new crosscurrents from technology to globalization.*

Arthur Doyle

The transformation of college admissions into enrollment management was as much a reaction to the admissions depression of the late 1960s and early '70s as it was the result of proactive initiatives. Nonetheless, a new generation of admissions practitioners, many of them working in New England, brought the profession to its next iteration of development, resulting in efficiencies in recruitment, admissions and retention and providing lasting benefits to high schools, colleges, students and their parents.

What had been a narrowly focused process of reviewing college applications based on set campus policies evolved, in the words of Don Hossler, author of *Enrollment Management: An Integrated Approach*, into an "activity that influences the size, the shape and the characteristics of a student body by directing institutional efforts in marketing, recruitment and admissions, as well as pricing and financial aid. In addition, the process exerts a significant influence on academic advising, institutional research agendas, orientation, retention studies and student services." As Hossler further noted, "It is not simply an administrative process. Enrollment management involves the entire campus."

New England's role in this evolution was vital. The Northeast Association for Institutional Research, comprising the New England and Middle Atlantic states, served as a valuable laboratory where an eclectic gathering of campus and association representatives could absorb, refine and build upon one another's findings, insights and techniques for meeting quantitative enrollment goals while incrementally increasing the academic quality of each succeeding enrolling class and minimizing attrition.

Also noteworthy was the presence in New England of the Summer Institute on College Admissions, which is still cosponsored by Harvard University and The College Board as the oldest continuously operating professional development program for admissions officers in the United States. Through this forum, many of the region's admissions officers moved beyond being recruiters by seizing the new techniques of the day such as "predictive validity." This technique enabled admissions officers to use regression analysis to assign quantitative values to predictors of freshman-year success, such as high school class rank and Scholastic Assessment Test (SAT) scores, and then add to that, qualitative information based, for example, on interviews, recommendations and applications.

## THE NINETIES

### 1990

- National Science Foundation awards multimillion-dollar National High Magnetic Field Laboratory to Florida State University over the Massachusetts Institute of Technology, symbolizing for many the erosion of New England's longstanding research edge.
- Conservative commentators and others assail speech codes and other "politically correct" campus policies.

- The Baby Bust reaches New England campuses; NEBHE's 31st annual "vacancy" survey reveals more than 19,000 fall-term openings for qualified freshmen as of the traditional May 1 admissions deadline.
- National Center on Education and the Economy publishes *America's Choice: high skills or low wages!*, including recommendations to introduce a range of school-to-work transition



programs and increase workforce productivity.

- Congress passes the Student Right-to-Know and Campus Security Act, requiring campuses to provide information on graduation rates of student-athletes and crime statistics.
- University of Maine System Chancellor Robert L. Woodbury assumes NEBHE chairmanship.



Another New England contribution was Harvard College Director of Admissions Humphrey Doermann's classic 1969 book, *Crosscurrents in College Admissions*, which offered the first classification of prospective college applicants by both admissions test scores and family ability to pay.

Improved yield ratios, based partly upon the more studied impact of student financial assistance, earned New England institutions and many of their admissions administrators a hallmark role in the introduction and advancement of enrollment management.

Specific institutions also adopted approaches that were new to them. For example, in 1970, Boston College abandoned its longstanding policy of discouraging transfer applicants and began enrolling students under both a new transfer policy and a new coed admissions policy. The new transfer policy reshaped the student body's self-image, as very capable underclassmen from many of the nation's selective institutions sought a Boston College education. Both policies greatly influenced the institution's attractiveness and future enrollment patterns, while reversing an expensive attrition problem.

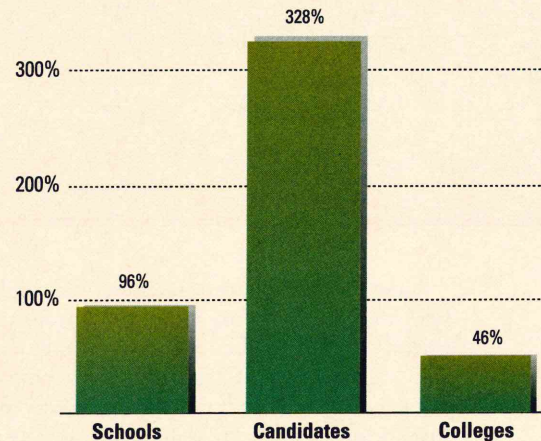
**T**oday, institutions — and particularly enrollment managers — must prepare for new crosscurrents. For example, Internet delivery of college guidance information, admissions applications and assessment is destined to unleash a new wave of administrative creativity, as prospective students are afforded previously unavailable opportunities to roam the curriculum, the campus, classrooms, dormitories, libraries and extracurricular activities through virtual reality.

Indeed, we have already ventured into an era of new capacity, thanks in part to software support systems such as the College Board's ExPAN guidance and application network, the School to College Placement Articulation Software Service (PASS) now used with computerized placement tests, financial aid software from the College Scholarship Service, and an overarching initiative identified as Transition 2000, which will include the electronic delivery of the SAT.

## SMARTS

### New England Advanced Placement: 1970-1994

Advanced Placement (AP) is based on the premise that college-level material can be taught successfully to well-prepared secondary school students. About 2,900 colleges and universities nationwide grant credit or advanced standing to students who do well on AP exams. The College Board, sponsor of the AP program, reports that in 1994, more than 300,000 students received grades of 3, 4 or 5 on their exams, qualifying them for credit at 2,900 colleges and universities nationwide. More than 50,000 students qualified to enter college as sophomores.



Source: NEBHE analysis of College Board data

Multimedia navigation of the campus may never replace personal interviews and campus tours, but the technological changes sweeping admissions will be enlivening. And enrollment managers will be challenged by a new level of consumerism, as students and parents take advantage of electronic access to an increasing flow of comparative information about colleges.

New England's role in the future of enrollment management will also depend on how the region's campuses respond to key issues such as the globalization of higher education and the increasing interdependence of higher education and K-12 education.

## 1991

- NEBHE publishes special issue of CONNECTION, titled *Thinking Environment*, beginning ongoing assessment of environmental education and technology in New England.

- New England unemployment rate averages 8 percent, compared with national average of 6.7 percent.



- A string of more than 30 Massachusetts bank failures over two years culminates with the collapse of the Bank of New England, the nation's fourth largest bank failure at the time. The bank's assets are acquired by Fleet/Norstar Financial Group of Rhode Island.



- Military operations end at Pease Air Force Base, prompting plans for an international tradeport at the New Hampshire Seacoast site.



## ADVANCED PLACEMENT EXAMINATIONS BY STATE: 1994

	11th & 12th Grade Enrollment	Total High Schools	AP High Schools	% of Total High Schools in AP	Total AP Candidates	Total AP Exams
Connecticut	69,085	228	178	78%	6,802	10,469
Maine	27,953	174	98	56%	1,861	2,520
Massachusetts	124,701	385	302	78%	13,097	20,116
New Hampshire	26,624	115	71	62%	1,846	2,613
Rhode Island	19,757	63	43	68%	1,387	2,032
Vermont	12,808	85	52	61%	945	1,344
New England	280,928	1,050	744	71%	25,938	39,094
United States	5,563,547	21,050	10,325	49%	447,972	684,449
New England as % of U.S.	5.0%	5.0%	7.2%	—	5.8%	5.7%

Source: *The College Board*

Increasing numbers of talented U.S. high school students are expressing interest in enrolling at institutions such as the University of British Columbia, McGill University, Cambridge University and the University of Galway. On the European continent, institutions such as Heidelberg University and the University of Montpelier attract American students with qualifying grades on a prescribed number and mix of Advanced Placement (AP) examinations. A number of New England's nationally ranked colleges and universities — because of their international reputations and infrastructure support — will also be in the vanguard of the movement toward transnational institutions of higher education. For New England, added impetus may come from the newly formed Congress of Atlantic Rim Nations, an economic complement to NATO which may be headquartered in Boston. Technology and education will be fundamental to the success of such economic unions.

Another pressing issue for enrollment management emanates from the education reform movement.

expectations of an increasingly vocal consumerist public, the implications of emerging State Postsecondary Review Entities and the reactions of school superintendents and others who, with fixed calendars and limited resources, question some higher education trends over the past two decades such as grade inflation, increasing numbers of years to degree completion for traditional students and rising costs.

Colleges defend these trends by citing the numbers of high school students who need developmental support upon enrollment in higher education. But the debate begs for solutions, not more fuel. And unless these solutions emerge from higher education's leadership or through consensus-building, there is an increasing risk of remedies being imposed by external entities.

The late Massachusetts Institute of Technology Admissions Director B. Alden Thresher observed that most of the decisions influencing access to higher education took place outside the admissions office — that admissions to college is part of a complex social process and must be interrelated to an increasingly seamless overall education system. "Matriculation

With elementary and secondary education experiencing systemic changes at local and state levels, policymakers are now turning attention toward linkages between K-12 and higher education, as well as toward productivity indicators for college student learning, including measurable evidence of improvements in critical thinking.

One might expect officials at both college and elementary/secondary levels to formulate a framework for a stronger connection between the too-often disconnected enterprises of K-12 and higher education. This is a propitious time for higher education to address the

- Security concerns stemming from Persian Gulf War result in cancellation of various study-abroad programs. Massachusetts and West Virginia make unsuccessful bids to lure students from heavily damaged Kuwait University.



- Tuition and mandatory fees at New England's private four-year colleges average \$13,487, compared with \$10,017 nationally. Tuition and mandatory fees at the region's public four-year colleges average \$3,439, compared with \$2,137 nationally.



aid programs and establishing State Postsecondary Review Entities to set statewide standards and deal with fraud and abuse.

### 1992

- Congress passes Higher Education Amendments, tightening rules for institutions participating in federal

- New England public colleges and universities stung by budget cuts. The state higher education appropriation in Massachusetts is down more than 30 percent from 1988.



management" — perhaps a 21st century extension of Thresher's thinking — could refresh admissions with a model that is focused on a two-way flow of information between K-12 and higher education.

Tomorrow's enrollment managers also must confront: imbalances between loans and grants, differences in skills development needs at multiple levels, recognition of different learning styles, differences in the accommodation of physical or learning disabilities, imbalances in the recognition of prior learning and the need for more research-based and equitable credit-by-examination policies.

Colleges must be particularly conscious of the implications of revising credit-by-examination policies, especially restricting credit hours awarded, at a time when schools and states have invested heavily in providing a more diverse population of successful AP candidates. Neither our colleges nor our schools can afford the cost of juniors enrolled in AP courses and ranked within the top 10 percent of their high school classes not having sufficient information on which to base a decision to challenge themselves on AP examinations.

New England's public and private institutions of higher education have often led the way in shaping the nation's education landscape. An opportunity appears to exist for renewing that leadership, beginning with enrollment management.

---

*Arthur Doyle is the executive director of college level and state services at The College Board and was a member of the founding staff of The College Board's New England Regional Office.*

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# A Common Market for Higher Education

*For four decades, the Regional Student Program has been spreading talent around New England.*

Kate Hann

**C**an higher education cooperation become a passionate, grassroots issue? You bet. As recession enveloped New England in 1989, the budget-strapped administration of Massachusetts Gov. Michael S. Dukakis withheld the state's \$400,000 assessment to the New England Board of Higher Education, rendering Massachusetts in default of its obligations to the New England Higher Education Compact, the six-state agreement that created the board in 1955.

Reneging on its obligation put the Bay State in danger of losing all board services, including tuition discounts for 1,400 Massachusetts residents studying at out-of-state public colleges and universities through NEBHE's Regional Student Program (RSP). Beacon Hill was inundated with letters and calls of protest from students and their parents. Even the *Boston Herald*, which had been highly critical of state spending on higher education, trumpeted the program: "If nothing changes, not only will 1,400 Massachusetts residents be ineligible for reduced tuition, the state itself will be eligible for lawsuits from the other five New England states, which though they have faced hard times themselves, chose not to sacri-

fice the future to balance their budgets today." In August 1989, Dukakis released a portion of the funds owed to NEBHE, and Massachusetts continues to benefit from the RSP.

**T**he RSP enables New England residents to pay significantly reduced tuition at out-of-state public colleges and universities within the region if they pursue certain degree programs not offered by public institutions in their home state. In the 1993-94 academic year, 6,750 RSP students saved an average of \$3,667 each for a total of nearly \$25 million. Indeed, since its inception in 1957, the program has saved New Englanders an estimated \$200 million on about 230,000 semester tuition bills.

As tuition rates for out-of-state students at public colleges have skyrocketed, the program's value has increased. This academic year, for example, New Hampshire residents attending the University of New Hampshire generally paid \$3,760 in tuition, while out-of-state students paid \$11,990. RSP students paid 150 percent of the in-state tuition rate or \$5,640, saving more than \$6,000 each. Essentially, the six New England states have agreed, through the RSP, to support regional students in the same way they support in-state students.

- Defense "drawdown" rattles defense-dependent local economies from Groton, Conn., to Bath, Maine. Connecticut sees value of defense contracts shrink from \$5 billion to \$3.1 billion in one year.
- New England is mired in recession. *Newsweek* tells readers: "The trick this year is finding those regions and occupations displaying a bit more strength than others. The Southwest and Mountain states, for instance, are growing modestly. One quick bit of advice: forget the Northeast; it's a disaster."

- Franklin Pierce College President and former New Hampshire Gov. Walter Peterson assumes NEBHE chairmanship.



er professionals to improve New England's two-year technical education programs.

- Congress passes Student Loan Reform Act, calling for "direct lending" from the U.S.

## 1993

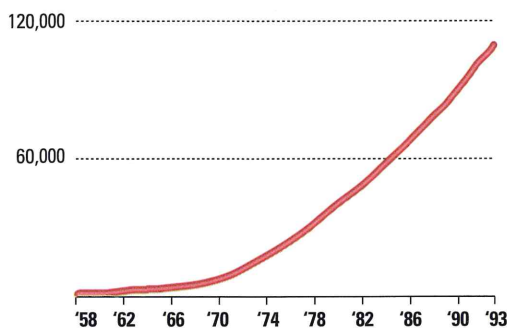
- NEBHE creates the New England Technical Education Partnership, bringing together educators and oth-

Treasury through colleges to students, and the National Service Trust Act, providing education grants in exchange for community service.



## CUMULATIVE NUMBER OF ANNUAL RSP EXCHANGES

1958-1994



Source: New England Board of Higher Education

There's no paperwork. Students simply indicate on their college applications that they're applying under the RSP. Admissions officers then inform the bursar's office of a student's status and charges are issued accordingly. RSP discounts are automatically applied each year unless the student switches into a non-RSP major.

**N**EBHE launched the RSP as part of its mission to expand educational opportunities in New England.

During its first 10 years, the program was available exclusively to students attending New England's public land-grant institutions. Community and technical colleges joined in the late 1960s, bringing about an immediate 55 percent increase in enrollment. In the early 1970s, the region's four-year state colleges joined the RSP, and annual enrollment grew beyond 2,500.

Today, all 79 New England public colleges and universities participate in the RSP, offering more than 900 programs at the certificate, associate, bachelor's, master's, doctorate and professional levels. Throughout its history, the RSP has focused on expanding opportunity to specialized fields. Peter Tessier, a

freshman from Lyndonville, Vt., says the most important factor in his choice of a college was finding the right undergraduate program, with cost a close second. The RSP helped him choose the chemical engineering program at the University of Maine. In addition to paying only 150 percent of UMaine's *in-state* tuition under the RSP, Tessier applies scholarships from both his high school and the university's Pulp and Paper Foundation. Other RSP students pursue majors in areas such as hydrology and water resource management, ecosystems and global biogeochemistry, terrestrial ecosystems studies, biotechnology, bio-resource engineering, biological engineering and telecommunications technology.

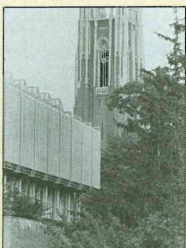
**T**he RSP not only saves New England students thousands of dollars in tuition, it also saves the region's taxpayers millions by enabling state higher education systems to avoid duplicating high-cost academic programs available in neighboring states. For example, both the University of Connecticut and the University of Rhode Island offer pharmacy through the RSP. URI officials estimate that it costs \$3 million a year to run the university's College of Pharmacy, and scientific equipment represents an investment of millions more. NEBHE's founders realized it would be inefficient to create those specialized programs in every state.

Campus officials view the RSP as a recruiting tool and a means of enhancing student diversity on campus. Indeed, when the RSP began, 90 percent of undergraduates at New England public colleges and universities were from within the state. Says Joyce Henckler, assistant vice president for enrollment management at the University of Maine, "The program allows us to have students attend from out of state, which increases the school's level of multiculturalism and diversity. It contributes to the enhancement of the overall student body."

"Today, with the pressures of funding cuts, students have had to pay extremely high out-of-state tuition," adds Delmore Kinney Jr., director of admissions at Western Connecticut State University. "We

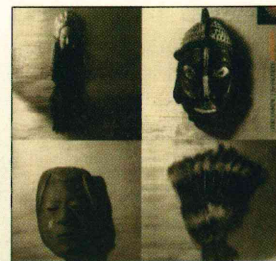
- Total charges at Yale University pass the \$25,000 mark, a milestone that would soon be reached by several other New England institutions.

- Wellesley College reports a 15 percent rise in freshman applications, attributed partly to the popularity of activist First Lady Hillary Rodham Clinton, who graduated from the women's college in 1969.



### 1994

- NEBHE establishes Regional Commission on Telecommunications and Distance Learning to clarify the challenges and opportunities the field presents to New England.
- With support from the Pew Charitable Trusts, the Ford Foundation and others, NEBHE and two other regional education agencies — the Southern Regional Education Board and the Western Interstate Commission for Higher Education — launch "Compact for Faculty Diversity" program to

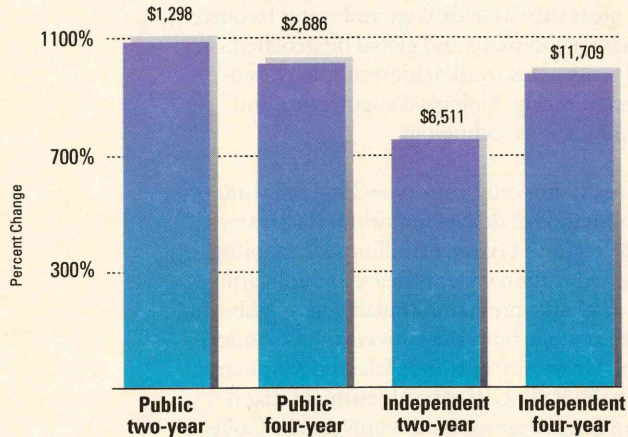


increase the number of African-Americans, Hispanics and Native Americans who complete Ph.D.s and enter college teaching.



## TUITION GROWTH: SELECTED NEW ENGLAND INSTITUTIONS

### AVERAGE U.S. TUITION INCREASES 1965-1994



Source: The College Board

Independent	1955-56	1994-95
American International College	\$510	\$9,478
Amherst College	\$1,411	\$20,052
Bowdoin College	\$700	\$19,355
Brown University	\$950	\$20,028
Bryant College	\$700	\$12,600
Dartmouth College	\$1,170	\$19,650
Harvard University	\$857	\$18,485
Massachusetts Institute of Technology	\$900	\$20,700
Roger Williams University	\$194	\$13,000
Trinity College	\$780	\$19,560
Tufts University	\$550	\$20,204
Wellesley College	\$1,850	\$18,705
Wesleyan University	\$660	\$19,790
Yale University	\$1,000	\$19,840

Public Land Grants <sup>1</sup>	1955-56	1994-95
University of Connecticut	\$160/\$410	\$4,712/\$12,554
University of Maine	\$316/\$551	\$3,650/\$9,410
University of Massachusetts (Amherst)	\$140/\$440	\$5,467/\$11,813
University of New Hampshire	\$300/\$600	\$4,559/\$12,879
University of Rhode Island	\$258/\$558	\$4,242/\$11,568
University of Vermont	\$345/\$705	\$6,652/\$15,958

Public <sup>1</sup>	1955-56	1994-95
Eastern Connecticut State University	\$60/\$60	\$3,355/\$8,283
Holyoke Community College	\$285/\$315	\$2,160/\$6,453
Johnson State College	Free/\$350	\$3,897/\$8,241

<sup>1</sup> For public institutions, in-state tuition and fees are listed first, followed by out-of-state tuition and fees.

Source: New England Board of Higher Education

create barriers between the states. The RSP helps to break down those barriers and makes going to college in another state much easier.”

Perhaps most importantly, the RSP provides a vivid example of how states can work together to expand opportunity for their residents, while saving money. More than a decade ago, Bennett D. Katz, chairman of the Maine Educational Loan Marketing Corp. and former Maine Senate Majority Leader, told a group of educators: “The concept of a common market in

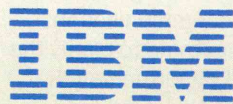
higher education has flowered in New England more than any other section of our country. To the extent we can expand our thinking beyond our state boundaries, to the extent we can put our brains to work beyond the narrow confines of a campus or a state system, we can contribute to a brighter future for our students and our economy.”

Kate Hann is the assistant editor of CONNECTION.

- Clinton administration unveils plans for National Information Infrastructure. Vice President Gore calls on private sector to extend universal telecommunications service and pledges to relax 60-year old federal communications regulations.



- “Information Superhighway” becomes a household word.



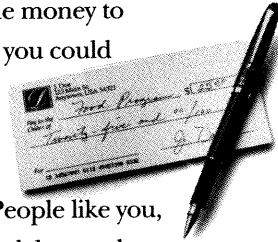
- A consortium of Vermont’s six public higher education institutions agree to manage all employee education and training for IBM Burlington — Vermont’s largest private employer.

- Connecticut Higher Education Commissioner Andrew G. De Rocco assumes NEBHE chairmanship.

- New England is home to 258 colleges and universities: 45 are public two-year colleges; 42 are public four-year institutions; 29 are private two-year colleges; 142 are private four-year institutions.



**T**here is nothing quite as satisfying as serving a hot meal to the needy. Unless of course, you're providing the money to purchase the food they're eating. Or you could do both. Selfless acts of giving define our basic humanity. They measure our ability to love, and nurture - all for the common good. People like you, who take the time to do volunteer work know what a positive difference it really makes. And you won't



They'll have a brighter future because your help will have gotten them through a dark or lonely period in their lives. They won't go to sleep hungry. They'll be touched by your companionship. While your efforts, your hours spent volunteering, will bring you a lifetime of fulfillment.

**Increase Your Giving To 5% Of Your Income.**

It's a cold, hard reality that everything costs money. Compassion is no exception. If we don't meet our

# Why a woman who owns her own restaurant goes to a soup kitchen for lunch.

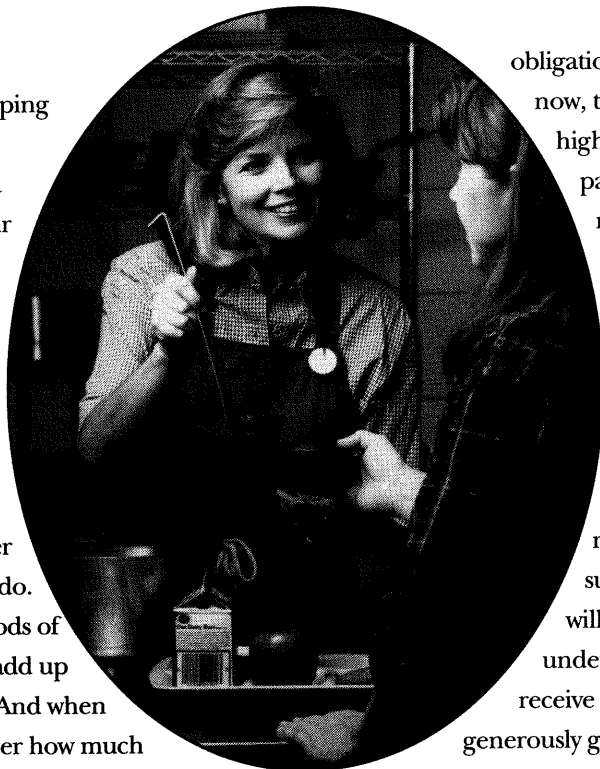
experience greater spiritual accomplishment than by helping others. So, whatever cause you're giving to now, make a commitment to increase your level of giving. Give Five.

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Does anyone have enough time to find five hours a



week for volunteer work? Many do. Short periods of time can add up to hours. And when you consider how much hope you bring spending just a few minutes with someone who needs you, imagine what increasing your volunteering to five hours could bring. Your time will buy days, months,



even years for someone else.

obligations to help now, there will be a higher price to pay later. Too many will suffer - adults, children, the elderly. Which is why increasing your annual giving to 5% of your income, whether given in increments or all at once, can have such a significant impact. It will buy much more than a regular supply of food and services. It will buy self respect and understanding for those who receive it. And even for those who generously gave it. Because when you put it in perspective, the most valuable things in life are not our bank accounts. It's the currency of emotions, of sharing, of helping that are worth the most.



**Give Five and feel like a winner every day.**

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# Higher Education, Economic Development and Regionalism: Snippets from a 40-Year Conversation

"The purposes of the New England Higher Education Compact shall be to provide greater educational opportunities and services through the establishment and maintenance of a coordinated educational program for the persons residing in the several states of New England parties to this compact, with the aim of furthering higher education in the fields of medicine, dentistry, veterinary medicine, public health and in professional, technical, scientific, literary and other fields."

— *The New England Higher Education Compact, 1954*

"Our plans for the future are not big enough if our qualified young people — already born and enrolled in our schools — are to have the same opportunity for a higher education as their older brothers and sisters who are now in college. In other words, even if all the present hopes and expectations for expansion of all our New England college presidents are fulfilled within the next 10 years, we shall still fall far short of the predicted demand for higher education."

— *Robert H. Kroepsch, executive secretary of NEBHE, addressing the New England Association of Colleges and Secondary Schools, December 1958*

"We must eliminate the unfortunate tendency of legislators to think of educators as enemies of the taxpayer, and of educators to think of legislators as enemies of education. Each group basically has a genuine interest and concern in the problems of the other. Each should know and understand the other better. ... The peace and the stakes of the Cold War are such that we will not have time to do this job twice. A second-best effort will not be enough!"

— *U.S. Sen. Edmund S. Muskie in the NEBHE newsletter, Higher Education in New England, April 1959*

"Now, one distressing issue, in the financing of education, the effects of which the people and parents of our students have not yet fully understood; an issue which in the end, the people's own circumstances and good sense, I believe, will cause them to rise and rebuke. I refer to the argument for tuition and fees to meet or to approach full operating costs. This proposal is, of course, to me an incomprehensible repudiation of the whole philosophy of a successful democracy based upon an educated citizenry. The full- or nearly full-cost tuition proposal negates the whole concept of widespread educational opportunity made possible by the state university idea. It conceives college training as a personal investment for profit instead of a social investment."

— *University of Connecticut President Albert N. Jorgensen addressing the Association for Higher Education, 1960*

"Perhaps more than any other region, New England remains status-ridden about traditional academic degrees and programs. Technical education, with its occupational emphasis and its ambiguous place between the high school

and the four-year college, lacks social acceptability in comparison with baccalaureate liberal arts programs. High school advisors may suggest that a particular student consider a technical program, but his parents may insist on a liberal arts degree in a program like business administration."

— *NEBHE monograph on technical education, published in CONNECTION, Summer 1963*

"The future of New England's economy rests with the new technologically oriented manufacturing and service industries, rather than with old-line industries such as textiles, shoes and leather, and apparel. So far as public policy is concerned, this suggests that the New England states should place increasing emphasis on providing high-quality secondary school and college training so as to provide the necessary highly skilled labor force for the region's growing industries."

— *Robert W. Eisenmenger, vice president of the Federal Reserve Bank of Boston, in The Dynamics of Growth in New England's Economy: 1870-1964, published in 1967*

"Only the most confirmed no-sayer could argue against the desirability of some form of coordination in a region so compact and beset by common problems. In the words of Vermont's former Governor Philip H. Hoff, 'New Englanders are traditionally an independent and self-sufficient lot, traits to be nurtured and encouraged. But it is clear that in an era of increasing interdependence, independence can creep into a form of provincialism which works to the disadvantage of everyone.'"

— *Neal R. Peirce in The New England States: People, Politics, and Power in the Six New England States, 1972*

"Coping with enrollment stabilization, the changing nature of the student population, their preference shifts from private to public, and four-year to two-year institutions, rising costs with few gains in productivity and an apparent decreasing interest and support from government at all levels has become the order of the day, and in many instances, the *bete noire* of academic administration. The '70s may be, particularly within the private sector of higher education, a decade of institutional Darwinism."

— *NEBHE monograph on the condition of higher education, published in CONNECTION, Summer 1974*

"The competition for scarce resources and student consumers will require a willingness to plan, justify and make adjustments within a more collaborative and admittedly complicated regional framework. Individualism can remain a professorial characteristic, and excellence a departmental feature, but the isolationism of campuses from one another will reduce the prospect for adequate financial support from governments at all levels."

— *Massachusetts Secretary of Educational Affairs Joseph M. Cronin in Daedalus, Winter 1975*



"The fundamental focus of an economic strategy for the Northeast should be upon the retention and expansion of the region's existing economic base and upon rekindling the role of the region's urban areas as incubators of new indigenous enterprise. Though a strong case can be made for an aggressive regional campaign to attract foreign investment, there is little to be gained through traditional interstate competition to attract industry since only a small fraction of employment loss or gain is attributable to the interstate migration of firms. Furthermore, most interstate relocations are to neighboring states and not to the Sun Belt."

— *Revitalizing the Northeastern Economy, federally funded study by the Academy for Contemporary Problems, 1977*

"When you begin very noble talk about regionalism, everyone has three immediate concerns: 'What's in it for me?' 'What's it going to cost?' and 'Whose hands are on the steering wheel?' Even the most pious and worthy goals can crumble before the heavy weight of these three questions. The politics of regionalism are very real and he who ignores them does so at his own peril. The challenge is to successfully marry the altruism of the idealist and the pragmatism of the realist."

— *Former Maine Senate Majority Leader Bennett D. Katz addressing NEBHE, October 1981*

"What we must now do is emphasize that higher education is not only good in itself, but also that, either in the short run or, more importantly, in the long run, investment in higher education must result in substantial augmentation of the economic base of a particular state and of the New England region. My own impression is that the value of the investment in higher education has not been fully understood intellectually and certainly not in terms of the emotion-laden response of legislators and governors when the chips are down and they must cope with a shortfall in taxes or an excess in expenditures in the state budget."

— *Rhode Island state Sen. Robert J. McKenna in his foreword to Financing Higher Education: The Public Investment, published by NEBHE in 1982*

"The first factor affecting the competitive strength of the region's higher education system is a fundamental weakening of the very foundation for higher education — namely, the public school system. Specifically, the public secondary school system has deteriorated measurably over the past decade. Yet, it is virtually impossible to maintain superiority at the college and university level without competent education at the primary and secondary levels. Moreover, students going on to postsecondary vocational education programs must frequently 'relearn the basics,' diverting resources that could be more productively used for technical training. Finally, for students seeking jobs directly after high school, the public school system must constitute the future backbone of the region's skilled and technical workforce."

— *A Threat to Excellence, published by NEBHE in 1982*

"There is absolutely no chance of raising any kind of extra funds for higher education. Everything has to be done through reallocation, and that won't happen unless you get education involved with rising expectations for the economy."

— *John B. Duff, chancellor of the Massachusetts Board of Regents of Higher Education, at NEBHE invitational conference of New England education commissioners and higher education chancellors, September 1982*

"It has been recognized that the economic vitality of the New England region, and New Hampshire in particular, is tied to high technology, the backbone of New Hampshire's economic base. We cannot ignore serving businesses and industry in this and other areas. Our educational system at all levels must be assisted to stay abreast of the demands of a technological society."

— *John B. Tucker, New Hampshire House Speaker, addressing lawmakers, 1983*

"We are fast approaching a point where the lack of strong New England regional policy focused on educational telecommunications will constitute shirked responsibility as well as lost opportunity. As is so often the case in New England higher education, the very diversity of institutional efforts serves as both the obstacle to regional policy development as well as the unifying force for concerted action."

— *Higher Education Telecommunications: A New England Policy Imperative, published by NEBHE in 1983*

"One senses a regional loyalty and an enthusiasm for regional economic and educational development. The public, the legislators, higher education and business all seem ready to pitch in if appropriate programs are designed for each of the parties concerned. Is not now the time to take advantage of common concern and mutual respect and translate it into effective public policy?"

— *Renewing Excellence: The 1984 New England Legislative Survey, published by NEBHE in 1984*

"When Harvard was established in 1636, Galileo was still writing his text *Discorsi e Dimostrazioni Matematiche*. Rembrandt completed his painting *The Night Watch* the year of Harvard's first commencement. The College was nearly half-a-century old when Bach, Scarlatti and Handel were born. ...

Only 16 years after the Pilgrims landed at Plymouth, the General Court of Massachusetts made a major commitment to establishing a 'schoale or colledge.' In 1636, it voted a sum of 400 pounds for the infant institution, a quarter of that year's entire tax levy. The following year, a Board of Overseers was formed, and by the summer of 1638, the school had opened with a class of 12 students."

— *David Sanders, coordinator of the Harvard 350th Anniversary Celebration, in CONNECTION, Spring 1986*



“Our state universities are not as competitive as any other state system construed regionally because for years and years, those six state institutions have been starved financially. They have been abused politically. And they have been treated as institutions of second-class citizens when they are here in New England to serve and preserve the citizenry. Please don’t tell me that because of our extraordinary array of private institutions we don’t need to nourish the public ones. That’s an argument I’ve heard all my life and it’s based on something worse than smugness, and it’s false. New England’s best private universities are nationally oriented, not New England-oriented. They may be right or wrong in that, but it’s a fact and it’s not going to change. ... New England will not and cannot renew herself fully, fulfill herself economically, for her sons and daughters who are with us and for those yet to come, until America’s educational seat pays attention through the six state legislatures to those six public universities in a fashion consistent with the rhetoric and true needs of the people.”

— *Former Yale University President A. Bartlett Giamatti addressing the New England Council, as adapted in CONNECTION, Winter/Spring 1987*

“The New England region will require several replacements for the maturing computer and computer-peripheral industries. Biomedical industries are a strong contender, capable of generating new jobs and creating a ‘multiplier’ effect among support services and suppliers. ...

The Commission’s concern is ... that New England may not be able to capture the long-term economic benefits (jobs and taxes) of biotech manufacturing. Our concern is also that abundant capital from abroad directed at New England research will eventually succeed in moving research discoveries, and perhaps top-flight researchers themselves, from New England to Western Europe and Japan.”

— *Biomedical Research and Technology: A prognosis for international economic leadership, the report of NEBHE’s Commission on Academic Medical Centers and the Economy of New England, June 1988*

“The nation and New England have not met the 1960s imperative of eradicating racism, we are not meeting the 1980s imperative of full economic opportunity, and we will pay. ... Behind the statistics in this report are real people in real danger. But no emotional outpouring is needed to capture the key message: An unacceptably low number of Black and Hispanic students enroll in and graduate from New England’s colleges and universities. We must do better.

The issue is no longer one of charity, but of equity and an enlarged sense of enlightened self-interest. The survival and strength of the New England economy hinges on the education and skills of large segments of the population. Our companies cannot face competitors in Tokyo and Seoul if our colleges turn their backs on Blacks and Hispanics in New Haven and Boston.”

— *Equity and Pluralism: Full Participation of Blacks and Hispanics in New England Higher Education, the report of NEBHE’s Task Force on Black and Hispanic Student Enrollment and Retention in New England, January 1989*

“It is clear that the legal profession played a central and often indispensable role in negotiating the arrangements and preparing the documentation essential to capital formation and its infusion into the new ventures of the Information Society.”

— *Law and the Information Society, the report of NEBHE’s Commission on the Legal Profession and the Economy of New England, published in October 1989*

“The business and academic communities get together from time to time almost ritualistically to decide how to educate a productive workforce for the future. Invariably, the business community speaks, and the academic community — by which we mean the self-styled ‘educators’ rather than the teachers — listens reverently. Then, with reasonable dispatch — say three or four years, since this is after all the academic community — a new curriculum is built around the stated needs of business.

The result is that eventually a hapless class of freshmen arrive, to be told by advisors that a certain kind of computer programming, a certain breed of physics, a certain way of looking at business problems, is ‘hot’ and guarantees top-ticket employment.”

— *Former New England Business Editor Kenneth Hooker in CONNECTION, Spring 1990*

“Which is a greater threat to the quality of life in the United States — students who are inadequately prepared in mathematics and science, or an invasion of France by the Polish, Hungarian and Bulgarian armies? ...

The time has not come for the United States to disarm unilaterally — indeed, such a time will never come. Nor should we retreat to an isolationist position and break off ties with our allies. But it is also highly inappropriate — and damaging to our real national security — to keep spending tens of billions of dollars to repel a land invasion of Western Europe by the defunct Warsaw Pact, and to provide a level of subsidy in the military area to our Asian and European allies, who are no longer the poor relations of the 1940s and ’50s but are instead our economic competitors.”

— *Barney Frank, U.S. congressman from Massachusetts, in CONNECTION, Summer 1990*

“Two factors stand in the way of producing a highly educated workforce: We lack a clear standard of achievement and few students are motivated to work hard in school. One reason that students going right to work after school have little motivation to study hard is that they see little or no relationship between how well they do in school and what kind of job they can get after school. ...

We propose that all American students meet a national standard of educational excellence by age 16, or soon thereafter. Students passing a series of performance-based assessments that incorporate the standard would be awarded a Certificate of Mastery.”

— *America’s Choice: high skills or low wages!, the report of the National Center on Education and the Economy, 1990*



"MIT loses to Florida State.

If the above had been a box score, it would have been grudgingly accepted. New England college athletic teams, like Bulgarian wines, travel poorly. But such was not the case. Florida State had been chosen over the Massachusetts Institute of Technology as the site for a new multimillion-dollar National High-Magnetic Field Laboratory. This defeat was cerebral. ...

To put MIT's loss in perspective, one must remember that New England's only hope of resuscitation and future survival depends on the quality of its people, its brainpower, financial resources and entrepreneurship — its ability to generate spinoff industries. For this to happen requires a strong formal liaison between the region's universities, public and private; its legislators, state and national; and private industry. That liaison has collapsed. And it was the loss of the magnet lab to Florida that publicly revealed that collapse, although the mortar had been loosening for years without the media realizing it."

— *Ian Menzies, senior fellow at the John W. McCormack Institute of Public Affairs at the University of Massachusetts at Boston, in CONNECTION, Winter 1991*

"Catchphrases about racial and gender *quotas*, *freedom of speech* to protect racial and ethnic slurs and the inviolability of the *Western canons* in all forms are now intertwined with allegations of *bloated campus budgets* and the goal of *defunding, downsizing and privatizing* higher education."

— *Keene State College President Judith A. Sturnick in CONNECTION, Summer 1991*

"In the 1950s, we went so far as to disguise perfectly sensible outlays for physical and human capital as extensions of the Cold War, thus the 'National Defense Education Act' and the 'National Defense Highway Act.' We justified 'National Laboratories' only to the extent that they developed technologies and pools of skilled researchers suitable for designing and fabricating weapons. With the Cold War over and military spending winding down, an absolutely key policy dilemma for the 1990s and the next century will be how to design human capital strategies and research programs that serve commercial and civilian objectives, but are not incidental spillovers or byproducts of defense spending."

— *Columnist Robert Kuttner in CONNECTION, Winter 1992*

"Route 128 is more than just a stretch of highway dotted with companies. ... It is a creative phenomenon born of — and sustained by — the complex interactions of government, academia and industry. Only by examining the people, forces and events that shaped Massachusetts can we come to understand the true nature of this resource. And understanding it is critical. Unless we know what attitudes, actions and policies led to its development, we can inadvertently weaken or even destroy it. On the other hand, if we learn its secrets, we can make the phenomenon stronger, more productive and more widespread."

— *Susan Rosegrant and David Lampe in Route 128: Lessons from Boston's High-Tech Community, 1992*

"The U.S. economy is being transformed so that a greater share of total value-added is created by information-based activity — and higher education plays an essential role in creating new knowledge and educating people who use it in the work they do. Consequently, demand for education will grow as enterprises seek to improve their competitiveness and profitability. Demand for education will also grow as workers see the income gap widening between those with and those without a college degree."

— *A Chartbook of Trends Affecting Higher Education Finance 1960-1990, published by The Common Fund in 1992*

"As the countries of Western Europe have realized, economic cooperation leads to economic power. For New England, the alternative to regionalism is a slow but inescapable decline into economic marginality, with the six separate states ultimately becoming parts of a large, quaint colonial theme park visited by tourists from more prosperous states and nations."

— *New England Legal Foundation President Edward A. Schwartz in CONNECTION, Spring/Summer 1992*

"New Englanders must remember that a knack for technological innovation was the region's most competitive feature in the 1980s — and it will be the central factor influencing job growth over the balance of this decade. New Englanders should demand a working interstate partnership to support research and development in an effort to expand knowledge and create the jobs and industries that will keep the region competitive in the knowledge-intensive, global economy."

— *NEBHE President John C. Hoy in CONNECTION, Winter 1993*

"The digitization of information, which has significantly transformed publishing and music, will have an equally profound effect upon the way education is delivered. Liberated from the constraints of real-time delivery, educational programming will offer greater choice in format, design and content to students, whether they come to campus or not."

— *University of Maine at Augusta President George P. Connick and Jane A. Russo, executive assistant to the president, in CONNECTION, Summer 1994*

"It costs 30 grand a year to keep an inmate housed in a new \$100,000 prison cell. For that kind of dough, we could send everybody to Harvard, MIT or Wellesley. Which makes more sense to you: a half-billion more for prisons? Or less than half that for the system that educates 185,000 hard-working kids, most of whom will stay here and pay taxes for the rest of their lives?"

— *Columnist David Nyhan in the Boston Globe, February 1995*



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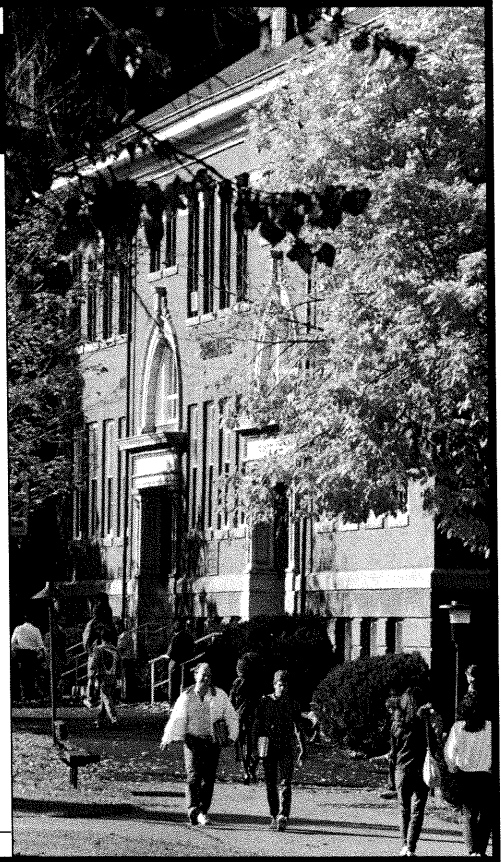
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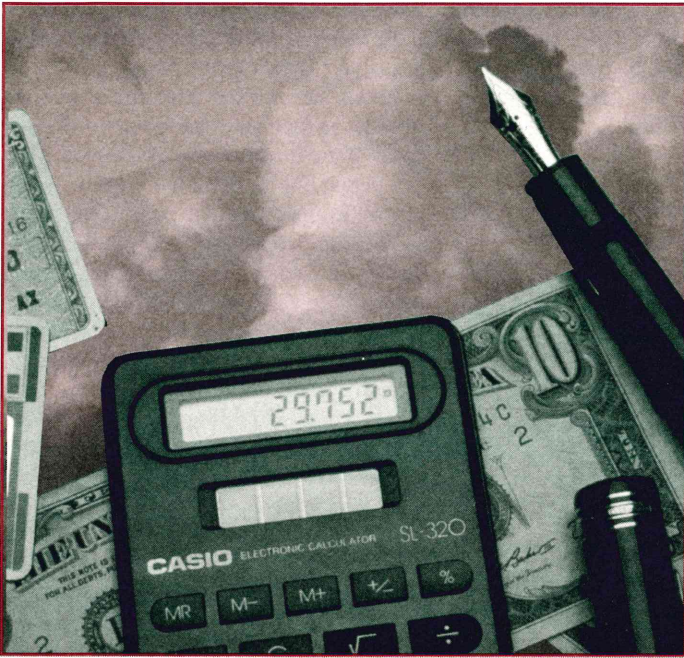
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CONNECTION report on  
the New England Economic  
Project "Outlook"*

## New England Economic Forecast: Labor Pains

**JOSEPH B. WHARTON**

**New England  
total employment  
will grow by 1.8  
percent in 1995  
and by an  
average of 1.5  
percent annually  
from 1996  
through 1998.**

**T**he total number of New England jobs will grow between 1995 and 1998, though at a slightly lower rate than the national average, according to an October 1994 forecast by the New England Economic Project (NEEP) a nonprofit association of economists from New England banks, higher education institutions, utilities and other organizations.

NEEP also projects that the lion's share of new jobs in New England will be in the service sector. After a one-year hiatus, manufacturing jobs will continue to decline in relation to overall jobs, falling to about the national average share of 15 percent by 1998. Wages and salaries will tend to be lower in the growing service sector than in the shrinking manufacturing sector, but the difference generally will not be great. The service sector will provide many good-paying jobs with excellent growth potential, but these will require a college education and technical skills.

### **National recovery**

Defined in terms of declines in gross domestic product, the national recession of 1990-91 lasted only three quarters and saw GDP fall about 0.5 percent. The ensuing national recovery — now as long-lived as the average postwar rebound — continues with no end or peak in sight. Yet until 1994, few economists were optimistic about the economic situation. The reason was the labor market.

An "employment recession" lasted more than twice as long — about 20 months — as the "output recession." During this period, almost 2 percent of U.S. jobs were lost. Even during the subsequent recovery, net job creation consistently ran below expectations based on historic norms. Highly publicized layoffs at

companies such as IBM, General Motors and Digital Equipment Corp. served to shake the long-term confidence of both white-collar and blue-collar workers. This retarded spending on durable goods requiring payments over time, including home and car purchases. The recovery, during its first two years, was frequently and aptly described as "half-speed."

In mid-1993, the two-year-old got over his colic! During 1994, national growth in jobs and economic output gathered momentum. Confidence returned to both consumers and business leaders, and the United States experienced that sublime state in which both output and employment grow rapidly, while inflation remains low.

There is now a genuine fear, however, that continued GDP growth of 4 percent could ignite inflation and burn the economy once again. The Federal Reserve's six interest rate hikes in 1994, followed by one in early 1995, show how seriously Chairman Alan Greenspan and others view this threat. Manufacturing capacity in key industries such as steel, autos and paper is fully utilized. NEEP economists have noted that labor markets in the Midwest and the South are reaching the flash point.

Regional Financial Associates, the West Chester, Pa., firm that provides NEEP with its national forecast, projects real U.S. GDP growth of 2.5 percent in 1995 and 2.7 percent in 1996, as well as national employment growth of 2.1 percent in 1995 and 1.7 percent in 1996. (Data released since October 1994 indicate that the economy had not responded to the Fed's monetary restraint. While the above forecast holds, there is an increased chance that the U.S. economy could exceed these projections in 1995. And if the Fed raises short-term rates too much, it could induce an early recession. This is a *risk*, not the forecast.)



## New England's Recovery

NEEP uses total employment as a yardstick to measure the basic strength of state and regional economies.

During the "Great Recession" of 1989 to 1992, New England lost 630,000 — or nearly 10 percent — of its jobs, thanks to Pentagon cuts in the nation's most defense-intensive region, the victory of the personal computer in the home of the minicomputer and the collapse of an overheated real estate market.

But since mid-1992, New England has been in a sustained recovery, with annual job growth of 1.8 percent. In these first two years of New England's recovery, the region has recovered a little more than one-third of the number of jobs it lost. But they are generally not the same jobs.

About 70 percent of the region's net new jobs are in services. Business services have grown fastest at more than 9 percent per year, in part reflecting a move toward temporary help. The health sector has grown at 3.5 percent, despite uncertainty over health care funding and some consolidation in hospital employment.

For some New England consumers and businesses, the good economic news seems to have erased the memory of the bad times. The Consumer Confidence Index for Massachusetts, compiled by NEEP and Cambridge-based Mass Insight, jumped 16 points from July to October 1994 to register a four-year high of 91. The Bank of Boston's Instant Reading Index of regional manufacturing performance hit an all-time high in September and spent most of 1994 in a range not experienced since 1988.

NEEP's new five-year forecast projects sustained, moderate growth for New England. It shows a bit more strength than NEEP's forecast of six months earlier, reflecting the added strength of the national and international economies. Between 1994 and 1998, real GDP is expected to grow at an annual average of 2.8 percent for both New England and the nation.

New England total employment will grow by 1.8 percent in 1995 and by an average of 1.5 percent annually from 1996 through 1998. While slightly below the U.S. projections, this growth is enough to damp down net out-migration, which reached nearly 35,000 in 1990. Population will expand at a healthy rate of 0.5 percent next year and rise to 0.7 annually between 1996 and 1998. Growth in the number of households will generate 5 percent average annual growth in housing permits between 1994 and 1998. Personal per-capita income for the six states, which stagnated from 1990

to 1993, will increase by 2.6 percent in real terms in 1995 and by an average 1.8 percent between 1996 and 1998. New England will maintain the highest income of any U.S. region, despite the poor performance of the early 1990s.

### Job growth

Individual New England states will fare differently in employment growth:

- New Hampshire led New England and ranked 25th nationally in job growth for the 12 months ending in November 1994, as it added jobs at a rate of 2.7 percent. With its low tax burden and image as a desirable place to locate a business, New Hampshire is expected to see employment grow 2.5 percent annually through 1998, compared with the projected U.S. growth of 1.8 percent.
- Massachusetts jobs grew by 2.4 percent during the period, ranking the Bay State 29th nationally in job growth. Much of the growth occurred in Boston-area business, management and engineering services firms, as well as software firms, which, by some estimates, have doubled in number during the past two years. But with manufacturing in other parts of the state continuing to decline, the forecast calls for more modest 1.5 percent over-all annual job growth through 1998.
- Vermont added jobs in 1994 at a rate of 1.7 percent, ranking 36th nationally. The state's computer industry continued to experience problems, and the fall of the Canadian dollar hurt retail sales. Forecast: 1.5 percent annual job growth through 1998.
- Maine jobs grew by 1.4 percent, ranking the state 41st nationally. The slow growth reflects weakness in the world pulp and paper industry, as well as the weak Canadian economy's effect on Maine tourism. The forecast calls for annual job growth of 1.5 percent.
- Rhode Island had a slow 1994, marked by decline in the defense industry and rejection of casinos by voters. Rhode Island added jobs at a rate of only 0.8 percent, ranking 47th in the country. The forecast calls for annual job growth of 1.2 percent.
- Connecticut has lagged behind the rest of New England during the recovery because of its heavy reliance on the shrinking defense and insurance industries. In 1994, Connecticut ranked 48th in the nation, with 0.6 percent job growth, the first real growth since 1988. This modest upturn reflects the success of the casino at Foxwoods. NEEP projects 1.4 percent annual job growth in Connecticut during the next four years.

The slow overall job growth, layoffs of mid-career employees and accelerated shift

from manufacturing to service jobs that have characterized New England's recent recession and subsequent recovery reveal important labor market issues.

NEEP's projection that both gross state product and real personal income will grow faster than employment during the forecast period implies that New England workers are increasing their productivity. As economist Paul Krugman of Stanford University has warned, "In the long run, barring some catastrophe, the rate of growth of living standards in a country is almost exactly equal to the amount that an average worker can produce in an hour."

On a more troubling note, Andrew M. Sum, director of Northeastern University's Center for Labor Market Studies, told NEEP that the percentage of New England's population that is in the labor force declined significantly during the recession and has not yet recovered. Discouraged workers would be expected to return to the labor market once job growth became significant. But the new jobs may require skills these workers don't have.

Economist Frank Levy of the Massachusetts Institute of Technology pointed to the increasing difference in the labor market opportunities for college and high school graduates. The gap has been a feature of the U.S. economy for nearly two decades. But in New England, the problem was masked during much of the 1980s, as high school graduates rode a construction boom that has now fizzled, probably for good. Indeed, differences in labor market opportunities among large groups of workers within New England are widening. This inequity is likely to strain the social fabric, and must be factored into future growth policies.

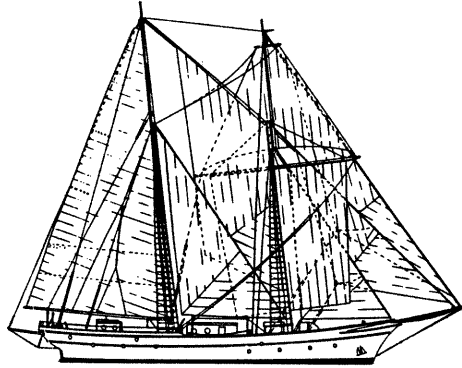
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*Joseph B. Wharton is president of the New England Economic Project and assistant to the president and CEO of New England Electric System. NEEP's outlook is based on a banking forecast by Philip J. Lane, professor of economics at Fairfield University in Connecticut; and state forecasts by Edward J. Deak, chairman of the economics department at Fairfield University; Charles S. Colgan, professor of public policy and management at the University of Southern Maine; Peter P. Kozel, professor of finance at Babson College in Massachusetts; Dennis C. Delay, senior economist at Public Service Co. of New Hampshire; Leonard Lardaro, economics professor at the University of Rhode Island; and Jeffrey B. Carr, consultant to the state of Vermont. Yolanda K. Kodrzycki, senior economist at the Federal Reserve Bank of Boston, serves as forecast manager.*



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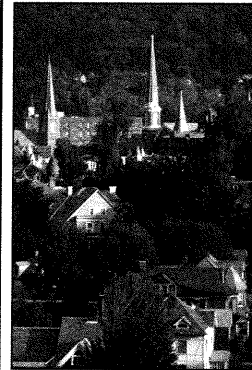


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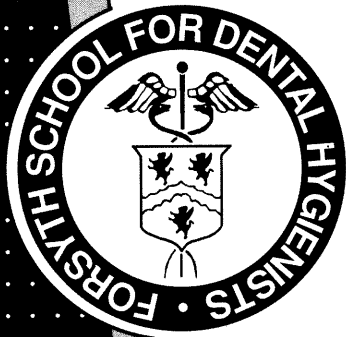
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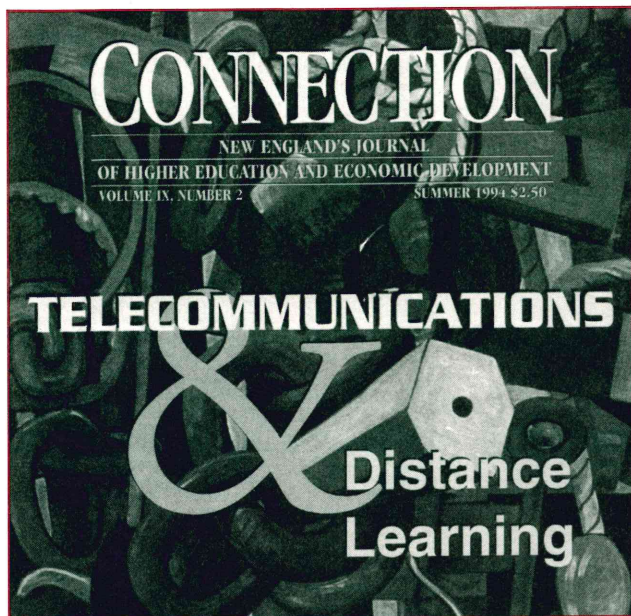
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## *Feedback:* Reengineering Distance Learning

**R. REMBERT ARANDA AND  
RICHARD P. VIGILANTE**

**Just as  
Hollywood  
producers  
learned the way  
to make a movie  
was not to put a  
camera in front  
of a theater  
stage,  
educators must  
rethink teaching  
and learning in  
light of new  
information  
technologies.**

**T**he Summer 1994 issue of CONNECTION surveyed opportunities for telecommunications applications in distance learning. Some contributors, not least Nathan Felde of NYNEX and Robert Tinker of TERC, pointed out the need to rethink the paradigm of higher education in order to effectively use our evolving information infrastructure.

Surprisingly, hypermedia — the combination of hypertext and multimedia — received scant mention. Today's hypermedia tools are being used to build both CD-ROM works and telecourses offered over a network. This technology has been used to reinvent the classroom, producing a richer, more accessible and more engaging experience than live or taped telecasts of typical lectures.

Hypermedia also promises to be a major engine of economic development. There is considerable market demand for online reference information and distance learning. To effectively meet this demand, we need to reengineer distance learning applications, rather than merely automate or repack-age traditional classrooms. The essence of this reengineering is viewing information technology both as a means for redesigning educational processes and as a basis for reframing the purposes served by those processes. This requires fundamental rethinking about educational goals, processes and assumptions.

The broadcast TV classroom model contains three assumptions that need reexamination.

First is the idea that a physical classroom with meetings at scheduled "live" times is ideal for instruction. Second is the notion that course content is a linear sequence, organized and paced by instructors. Third is the assumption that classroom communi-

cation is primarily a one-way broadcast, from instructor to students, and so instructors need larger communication channels than students.

When New York University's School of Continuing Education launched its Virtual College graduate-level teleprogram in 1992, it challenged these assumptions to demonstrate the potential of hypermedia for higher education.

The Virtual College uses no physical classrooms or traditional lectures. Instead, Lotus *Notes* groupware is used to create a virtual classroom that instructors and students attend when they want, from home or anywhere, with a telephone. The program emphasizes collaborative learning.

Students attend Virtual College classes over a network using PCs and laptop computers with telephone access to an online database storing course material as hypermedia. The documents in this database contain all class presentations and discussions. Students do not view these passively, but contribute their own questions and comments when attending virtual class. These messages and their replies become a part of the dynamic course database.

Students set their own pace, selecting among multiple learner-directed paths through course materials that integrate digital audio and video, text, animated graphics and interactive software. Students and faculty collaborate online to carry out class projects, typically in groups of five.

One result is increased student participation, and in significant measure, student-to-student interaction. This subtly changes the roles of lecturer and student.

During a two-week period, students in one course created an average of 35 online documents apiece, containing questions, analyses and project proposals. This participation rate would be rare in even the most active on-campus seminars. It underscores the



## WHAT IS HYPERMEDIA?

Hypermedia — the combination of *hypertext* and *multimedia* — is the technology used to develop the burgeoning number of CD-ROM multimedia titles on compact discs. These discs look like the audio CDs that replaced phonograph records, but contain “books” read with a CD-ROM player attached to a personal computer. Electronic “pages” are displayed on the computer screen. CDs have considerable storage. One disc contains more than 10 versions of the Bible. Another stores the entire text of the *New Encyclopaedia Britannica*, a dictionary and a thesaurus.

Multimedia titles differ from printed books in two important respects. First, they contain not only text and illustrations, but also sound, motion pictures and software. Secondly, instead of having a fixed order with a clear beginning and end, their content is interconnected through hypertext, allowing readers to select

multiple paths through the material by clicking on the computer screen.

For example, in reading a hypermedia title on marine biology, a reader encountering a mention of whale songs in the text could press on-screen buttons to hear some, perhaps with accompanying video of cetacean balladeers. Another reader might request literature references.

Today’s hypermedia tools can also be used to build telecourses and other online services. These look like CD-ROM multimedia with additional capabilities, including access to pages stored at remote locations and pages on which students can write to communicate with others over a network. Students in a hypermedia art course using the Internet could see a directory of the Louvre’s digitized art collection, and “travel” to France for a museum tour through their home computer.

need to afford students the same communication capacities as instructors, including the ability to communicate with other students directly. A high participation level was sustained even while many students were traveling on business as far away as Tokyo.

Students value learning how to use online tools to collaborate within a work group that is separated in space and time.

Online telecourses implicitly teach students much about the use, potential and limitations of the new technology. By course end, students attain considerable fluency in the use of telecollaboration software and the unwritten conventions of computer conferencing and electronic mail.

In fact, Virtual College courseware prepares students to exploit the next generation of interfaces to Internet resources, such as *Mosaic* and *World Wide Web*, which are based on hypermedia documents.

Hypermedia telecourses also increase administrative flexibility. A wider range of faculty members can be involved by easing calendar and geographical constraints. Students can select course start dates, meeting

times and places convenient for them. This is especially valuable for adult part-time students, who now account for more than one-third of the nation’s 14 million college students.

Online courses can also be used to reach historically underserved populations. New Hampshire’s Castle College, for example, has done pioneering work in improving accessibility by offering online courses leading to associate degrees for students unable to attend classes on campus.

Tunnel visions of future broadband capacity can blind us to opportunities for reengineering the classroom today by networking PCs over telephone lines, the narrowband lane of the “information highway.” Integrated Services Digital Network (ISDN) telephone service, more than 10 times faster than standard telephone lines, is rapidly reaching universal access. Even faster ISDN service is already available in some localities, delivering data over telephone lines at a rate about that of standard-speed CD-ROM players.

In collaboration with NYNEX, the Virtual College is using ISDN phone lines for

a trial of interactive video’s potential for home-based learning. The project, supported by a grant from the Alfred P. Sloan Foundation, is producing the first teleprogram in the nation to deliver higher education via interactive video through PCs in students’ homes. It offers an advanced professional certificate in information technology, whose courses double as the core of a master’s program in performance and information systems auditing.

This new program also demonstrates the potential of high-speed telephone lines to support wide-area collaboration, joining faculty based in New Hampshire, New York, Washington, D.C., and California with dispersed student homes.

Reengineering distance learning requires appreciation of the new possibilities created by technology, and receptivity to relevant lessons about new media use generated outside the academy. It didn’t take long for Hollywood to understand that the way to make a movie was not to put a camera in front of a theater stage, but to distinctively use the medium to produce magic not possible before. It has taken longer for mainstream educators to grasp this concept.

Producing effective multimedia telecourses is more like producing a television series than publishing a book. The know-how required for excellence in such production (especially sound and full-motion video segments) is rare in most university departments.

A promising avenue for disseminating such expertise is offered by the recently formed New Media Centers consortium. Vermont’s Bennington College — the only New England consortium member — will soon open a center supporting interdisciplinary collaboration to make effective pedagogical use of multimedia.

The old saw about teachers learning by teaching rings true at the Virtual College. Evaluation mechanisms have been incorporated to maximize practical learning about the benefits and limitations of the new media for distance learning. These findings should assist other pioneers aiming for the breakthroughs that the new technology offers.

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*R. Rembert Aranda is managing director of the New Hampshire systems consultancy Aragon Associates Inc., and adjunct professor of information systems at New York University’s Information Technologies Institute. Richard P. Vigilante is the director of the institute, and the developer of its Virtual College teleprogram.*



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**HOLYOKE, MASS.** — Holyoke Community College launched a program to retrain registered nurses for work in ambulatory, home hospice and long-term care settings, as cost pressures lead to shorter stays in acute care hospitals. The program, supported by an \$81,000 grant from the Massachusetts Department of Medical Security, will enroll up to 20 students at the community college campus and 20 more at a site in Great Barrington, Mass.

**NEW HAVEN, CONN.** — Yale University announced plans to increase university purchasing in the city of New Haven by 10 percent during fiscal 1995. Through the "Buy in New Haven" program, Yale will buy more food and beverages, medical and office supplies, furnishings, photocopying, laundry and data processing from companies within city limits. Yale spent an estimated \$7.9 million on these goods and services in New Haven in 1993.

**CAMBRIDGE, MASS.** — Harvard Law School received its largest-ever cash gift — \$13 million from Gustave M. and Rita E. Hauser of New York City. A new classroom and faculty office building will be named for the couple who met at the law school in the 1950s.

**CONCORD, N.H.** — Franklin Pierce Law Center's Civil Practice Clinic was awarded \$100,000 by the U.S. Department of Education to support programs for law students who represent low-income clients and community groups. The grant will also fund expanded programs in alternative dispute resolution.

**HAVERHILL, MASS.** — Northern Essex Community College introduced the nation's first credit program in medical interpreting. The three-semester program will train bilingual students to serve as interpreters for patients who speak little or no English.

**PROVIDENCE, R.I.** — Brown University was awarded \$2.5 million by the Robert Wood Johnson Foundation to host a national initiative aimed at improving delivery of health care to the poor and the uninsured.

**LOWELL, MASS.** — The Work Environment Program at the University of Massachusetts at Lowell was awarded \$885,000 by the National Institute for Occupational Safety and Health to study health hazards faced by construction workers and conduct ergonomic assessments of construction work.

**NORWALK, CONN.** — Norwalk Community-Technical College received \$230,000 from the General Electric Fund and GE Capital to support the college's "Bridges and Anchors," program, which encourages women and minorities to pursue studies at NCTC's technology division and then complete bachelor's degrees in engineering at other four-year institutions. The GE Fund will provide \$105,000 over three years, while GE Capital provides \$125,000 over five years.

**BANGOR, MAINE** — Husson College alumnus Richard E. Dyke donated \$265,000 to the college to establish a Center for Family Business aimed at promoting the startup, growth and continuation of family-owned enterprises in Maine.

**AMHERST, MASS.** — The University of Massachusetts at Amherst received \$550,000 from the W.M. Keck Foundation toward the purchase of a state-of-the-art transmission electron microscope to be housed in a new polymer morphology laboratory at the university's Silvio O. Conte National Center for Polymer Research. The lab is expected to open by the start of the 1995-96 academic year.

**STORRS, CONN.** — Two University of Connecticut professors were awarded a three-

year, \$600,000 grant from the U.S. Department of Defense to study ways to extend the shelf life of canned and freeze-dried meats, fish and chicken.

**NORTH DARTMOUTH, MASS.** — The University of Massachusetts at Dartmouth launched a three-way research collaboration with UMass-Amherst and the Cranberry Experiment Station in Wareham, Mass. Funded by a \$343,138 appropriation from the state Legislature, scientists from the three facilities will explore ways to increase crop yield and reduce pests without harming the environment.

**KINGSTON, R.I.** — A University of Rhode Island nursing professor received a three-year, \$61,000 grant from the Helene Fuld Health Trust to establish a Nursing Learning Center at Rhode Island Hospital. The center will feature multimedia computer systems, enabling professionals and students to learn in an environment where mistakes do not endanger patients.

**MILTON, MASS.** — Aquinas College at Milton launched a Tech Prep program in collaboration with the nearby Stoughton Public Schools. Through the program, Stoughton students can earn up to nine college credits, and eligible students will be guaranteed admission to an Aquinas computer and business technology program.

**NEW HAVEN, CONN.** — Yale University joined with the New Haven Public Schools to plan a new Career High School, a magnet school focusing on health professions, computers and business. Yale will help formulate the school's science and math curricula and identify other ways to contribute to Career High.

**WORCESTER, MASS.** — Worcester Polytechnic Institute entered into a five-year, \$1.4 million agreement with the U.S. Department of Energy to conduct research in clean metal casting,

particularly aluminum casting alloys. The research — aimed at minimizing scrap and boosting the competitiveness of the U.S. casting industry — will take place at WPI's industry-sponsored Aluminum Casting Research Laboratory.

**MANCHESTER, N.H.** — New Hampshire College announced it will offer a new undergraduate major in psychology, beginning in fall 1995. The major is the sixth to be offered through the college's division of liberal arts, which was launched in 1992.

**FALL RIVER, MASS.** — The Bristol Community College Foundation received a pledge of up to \$500,000 in federal matching funds from the U.S. Department of Education's Endowment Challenge Grant program. The federal government will provide \$2 for every \$1 up to \$250,000 that is raised by the foundation.

**BROOKLINE, MASS.** — Hebrew College and Boston's Beth Israel Hospital unveiled a six-week Pastoral Care Adjunct Program to train lay persons in addressing the spiritual needs of sick and elderly patients recently released from the hospital or suffering from chronic or terminal health problems.

**NEWPORT, R.I.** — Salve Regina University and Aquidneck Island schools received \$135,000 from the Davis Educational Foundation to supplement textbook learning with interactive materials. Salve Regina plans to install workstations with CD-ROM and laser disk capabilities, and establish a multimedia production area for use by the university and local schools.

**FITCHBURG, MASS.** — Fitchburg State College secured state approval to offer a new master's degree in business administration, beginning in fall 1995. About 50 students are expected to enroll in the first year.



**KINGSTON, R.I.** — The Narragansett Improvement Company of Rhode Island, a road construction company, donated \$100,000 to the University of Rhode Island to provide scholarships for state residents planning to pursue bachelor's degrees in civil engineering.

**NORTH GRAFTON, MASS.** — Tufts University School of Veterinary Medicine unveiled a new joint degree program with the University of Vermont, in which students will be jointly admitted to the veterinary school and UVM's College of Agriculture and Life Sciences.

**MIDDLETOWN, CONN.** — Wesleyan University announced it will offer four-year scholarships to students from 10 Pacific Rim countries through a program supported by the Freeman Foundation. The Wesleyan Freeman Asian Scholars Program, funded with \$10 million during the first five years, aims to help students cover college expenses in the hope they will graduate with strong liberal arts backgrounds and return to their countries to assume leadership positions in their fields.

**SOUTH HADLEY, MASS.** — A Mount Holyoke College geography professor was awarded more than \$232,000 by the U.S. Environmental Protection Agency and the Department of Agriculture to determine the effects of land development on Lake Champlain and the effects of global warming on forests in northern New England. Among other things, Thomas L. Millette will use satellite imagery to develop land cover classifications for more than 6 million acres of the Lake Champlain basin.

**NORTH ANDOVER, MASS.** — Merrimack College was awarded \$463,941 by the U.S. Department of Housing and Urban Development to launch a variety of economic development initiatives in Lawrence, Mass. Projects will include an

electronic bulletin board information center, a program to reduce high school dropout rates and training for owners of small businesses.

**WEST HAVEN, CONN.** — The University of New Haven received a two-year, \$238,852 grant from the National Science Foundation to continue its Young Scholars Program. The residential summer enrichment program is designed to introduce qualified high school juniors and seniors — especially economically disadvantaged students and females — to education and career opportunities in manufacturing and industrial engineering.

**BEVERLY, MASS.** — Endicott College won approval from the state Higher Education Coordinating Council to offer a bachelor's degree program in nursing. The program is geared to registered nurses who have already earned two-year degrees. The former two-year college now offers seven bachelor's programs. Endicott also launched an International Programme for Hospitality Studies, which the college says combines Swiss skills-based training with U.S. business studies and British competence-based education.

**SMITHFIELD, R.I.** — Bryant College's Center for International Business and Economic Development received \$1 million from the U.S. Department of Housing and Urban Development to support economic development initiatives in Rhode Island and other parts of southern New England. The funds will support efforts to promote international trade, small business development, family enterprises and executive training.

**AMHERST, MASS.** — Amherst College was awarded \$1.8 million by the National Science Foundation to upgrade its biology and neuroscience facilities. Under the terms of the NSF grant, Amherst must provide \$6.3 million in matching funds.

Amherst received \$250,000 toward the goal from the Humana Foundation of Louisville, Ky. Humana also provided funding to create new endowments at the Folger Shakespeare Library in Washington, D.C., which is administered by the college's trustees.

**WEST HARTFORD, CONN.** — The University of Hartford was awarded \$51,074 by the National Science Foundation to develop and institute a new method for introducing geographical information systems to undergraduates. The grant will be used to develop laboratory exercises balancing software training with the conceptual basis for GIS, which can be used, for example, to map population shifts in voting districts.

**BOSTON, MASS.** — Boston University's School of Public Health was awarded \$500,000 by the AmeriCorps program to train returned Peace Corps volunteers to help 15 eastern Massachusetts communities that have high rates of disease, drug use and poverty. Under the program, the former Peace Corps workers will earn master's degrees in public health, while working on housing and health problems in designated communities.

**BAR HARBOR, MAINE** — College of the Atlantic was awarded \$100,000 by the Burton G. Bettingen Corp. to support the college's operating budget, faculty salaries, student financial aid and educational programs. The grant is the fifth made by the California foundation to the college in the past five years.

**WARWICK, R.I.** — The Community College of Rhode Island received a \$113,970 demonstration grant from the U.S. Department of Education to develop a model "school-to-work" program for both college-bound and non-college-bound young people. The program will integrate the college's cooperative

education program with the state's nine regional career and technical centers. CCRI also was awarded a \$96,769 contract from the state's Department of Employment and Training to provide educational services to 400 discharged workers from Electric Boat.

**WORCESTER, MASS.** — The College of the Holy Cross ended its five-year Campaign for Holy Cross with \$76.6 million in capital and annual funds — 27 percent over its \$60 million goal. Nearly 55 percent of Holy Cross alumni contributed to the 1994 annual fund drive, compared with a national average alumni participation rate of 22 percent.

**AMHERST, MASS.** — The Civil and Environmental Engineering Department at the University of Massachusetts at Amherst received \$1.3 million from the U.S. Department of Defense to train people — from high school graduates to out-of-work engineers — in hazardous waste cleanup. UMass and its public and private partners in the Environmental Technology Program Consortium will provide training on campus and at Fort Devens in Ayer, Mass.

**PROVIDENCE, R.I.** — Brown University's Institute for Brain and Neural Systems was awarded a three-year, \$500,000 grant from the Charles A. Dana Foundation to study how brain cells store and retrieve memories. The work may help scientists reduce or prevent the memory loss many people experience with age.

**MANCHESTER, N.H.** — Notre Dame College began offering a certificate program in child development to prepare students for teaching at a child care center, nursery school, preschool or kindergarten. Students may complete the program in two years by attending classes one weekend each month.



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**KINGSTON, R.I.** — The University of Rhode Island's College of Pharmacy received \$500,000 from CVS to establish a professorship in retail pharmacy. The drugstore chain's president, Thomas Ryan, is a graduate of the college.

**NEW HAVEN, CONN.** — Yale University received a \$1 million gift from alumnus Robert Haas and his wife Candice to endow an associate professorship in corporate finance at the university's School of Management.

**BUZZARDS BAY, MASS.** — Mobil Corp. presented the second half of a \$92,000 grant to the Massachusetts Maritime Academy for the development of an oil spill simulator — the first of its kind in the United States. The simulator will provide realistic spill-management simulations, helping students learn how to analyze oil spills and respond effectively.

**BOSTON, MASS.** — Boston University's School of Social Work was awarded a three-year, \$765,000 grant from the Kellogg Foundation's Families and Neighborhoods Program to bolster outreach efforts in Chelsea, Mass., and Boston's Roxbury section. The grant will be used to develop a community-driven approach to human services and the training of human service workers.

**BIDDEFORD, MAINE** — Dexter Shoe Co. founder Harold Alfond gave the University of New England a \$1 million challenge grant to help the school build a new \$18.8 million health sciences education center. The university also received \$500,000 from the Virginia Hodgkins Somers Foundation, \$400,000 of which will support the construction of the new center; the remainder will be used to sponsor an annual symposium on children and health.

**STORRS, CONN.** — The University of Connecticut's School of Business Administration entered a partnership with First Fidelity

Bancorp of Newark, N.J., and its Stamford, Conn.-based subsidiary, Union Trust Co., in which the companies will send a stream of executives to UConn to give lectures related to their specialties.

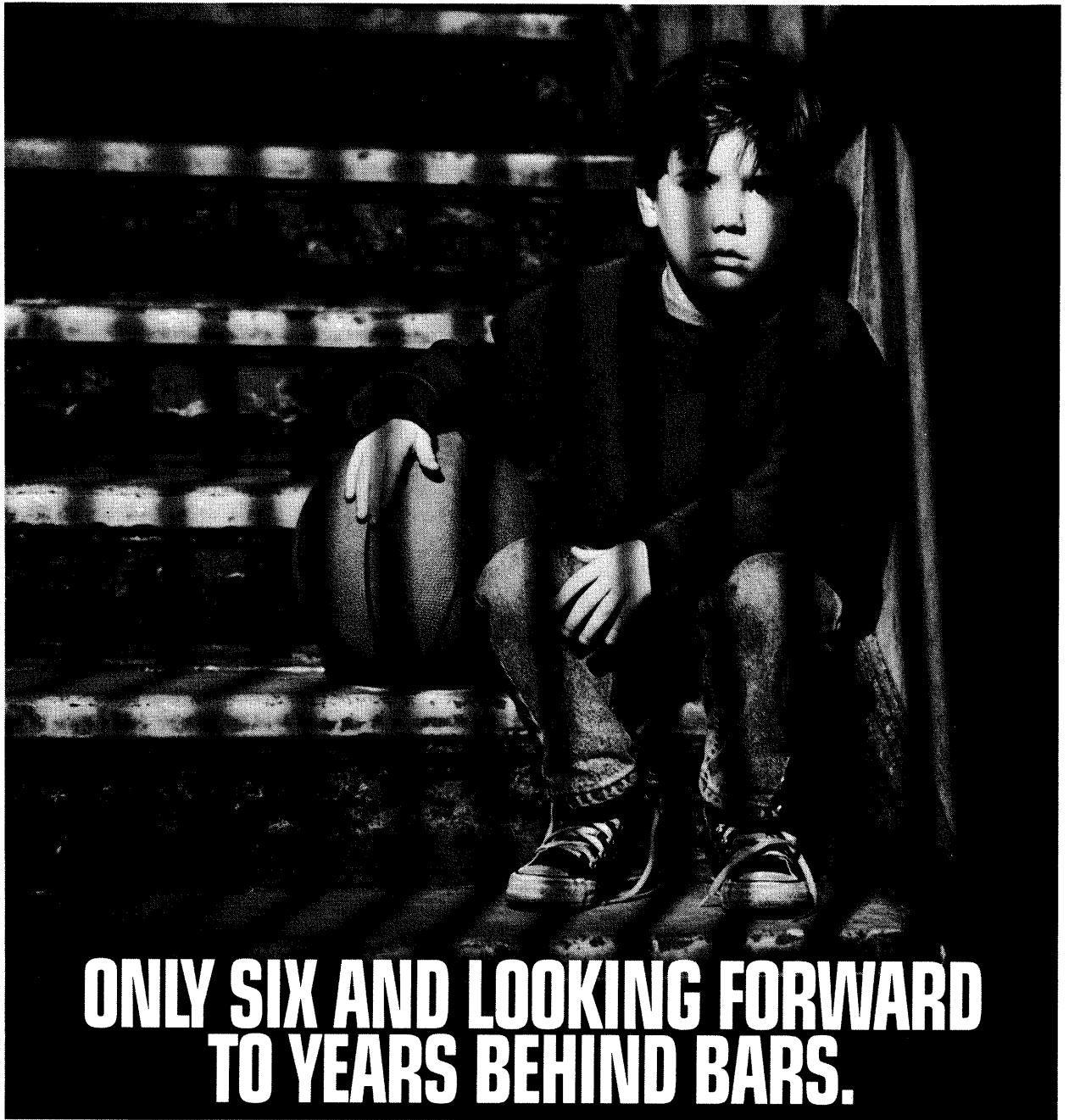
**AMHERST, MASS.** — The National Science Foundation awarded a five-year, \$7 million grant to the University of Massachusetts at Amherst to create a Materials Research Science and Engineering Center for studying new classes of adhesives, coatings, composites, biodegradable polymers and advanced bio-engineered materials made of synthetic proteins. The project will forge a research alliance between polymer chemists, physicists, engineers and molecular biologists.

**DURHAM, N.H.** — The University of New Hampshire introduced an associate degree program to prepare students for certification as registered dietetic technicians. The two-year program is designed to allow smooth transfer into a bachelor's level nutritional sciences program, which in turn may lead to certification as a registered dietitian.

**NORTH DARTMOUTH, MASS.** — The University of Massachusetts at Dartmouth launched its first doctoral program and the state's only Ph.D.-level electrical engineering program with a marine orientation. The program will provide education, research and advanced technology through the new Laboratory for Marine Science, Environment and Technology.

**RANDOLPH CENTER, VT.** — Vermont Technical College announced it would offer a new bachelor's degree program in electromechanical engineering technology, beginning in fall 1995. The interdisciplinary program will build upon the school's existing two-year programs in electrical/electronics engineering technology and mechanical engineering technology.





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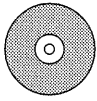




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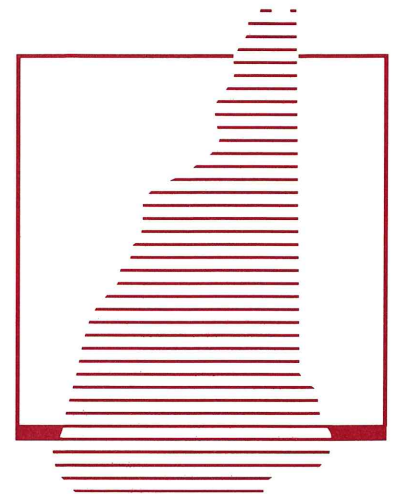
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