The Public's Business

140 YEARS AFTER MORRILL, NEW ENGLAND'S LAND GRANTS ARE CRUCIAL BUSINESS PARTNERS ... BUT COULD THEY BE MORE?

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Since his death more than 100 years ago, Vermonter Justin Morrill has largely faded into obscurity. Few remember his long career in government as both a Whig and Republican congressman and senator, his authorship of the Tariff Act of 1861 or his chairmanship of the House Ways and Means Committee. But mention Morrill in the context of higher education, and something might click. It was Morrill, after all, who composed and championed the Land Grant Act of 1862, with which his name will be forever linked. If copying is the sincerest form of flattery, then Morrill's Land Grant legislation is well-honored. Among emulative programs: the 1966 Sea Grant program (thanks largely to another New Englander, U.S. Sen. Claiborne Pell of Rhode Island), the 1987 Space Grant program and the never-enacted High-Tech Morrill Act, the late U.S. Sen. Paul Tsongas's 1980s attempt to support business-higher education partnerships in math and science education.

No wonder Vermont Public Television saw fit to examine Morrill's life a few years ago with an hour-long documentary titled *Land for Learning*. Producer Jill Halstead says the Strafford, Vt.-native was a natural for late 20th century revival. "He opened higher ed to a whole class of society who would never have gotten close," she says. "The Land Grants provided not only practical things like agricultural and engineering skills but also language, arts and history."

Morrill also made the Land Grant institutions implicit partners with the agriculturists and industrial entrepreneurs upon whom the wealth of the nation depended.

Today, Land Grants continue in these familiar roles, but also in new ones. The National Association of State Universities and Land Grant Colleges (NASULGC) reports that public universities, led by Land Grants, provide major stimuli to state and regional economies, generating $5 on average for every state tax dollar invested. The institutions capture an average of $105 million a year in research grants and contracts. They also attract new business: nearly two-thirds of them sponsor research parks or business incubators.

Still, many economic development pros hope these special institutions can do more. Some talk about renewing the Land Grant for the 21st century with new legislation such as the proposed Higher Education Millennial Partnership Act, a loose plan to offer Land Grant universities the technological tools to revolutionize higher education, perhaps using governmental sales of sections of the electronic spectrum as a source of funds. "Almost everyone involved believes that while the original Land Grant provided grants of land to be used or sold to create an endowment for the new colleges, this time around, the millennium land grant should focus in one way or another on technology," says University of Maine President Peter S. Hoff.

The Morrill of the story

Though New England was a national center of education before Morrill (Harvard had already been operating for more than 200 years), the legislation made the most of government largesse, providing states with federally owned tracts of land to sell or lease and use the revenues to create colleges geared to the needs of the state economy.

Massachusetts chose to split its appropriations between the Massachusetts Agricultural College, now UMass-Amherst, and a college emphasizing mechanic arts, the private Massachusetts Institute of Technology. MIT received $3,409 under the legislation, "a drop in

the bucket, even in 1865," according to MIT associate news office director Robert Sales. Still, the funds gave MIT's founding president, William Barton Rogers, the help he needed to complete the creation of the institution that would come to symbolize technological know-how. As MIT is fond of noting, it has played midwife to thousands of new enterprises and, indeed, whole industries over the past 140 years. As of 1994, firms launched by MIT graduates employed 1.1 million people and "if they formed a nation … would have ranked that year as the 24th largest economy in the world."

For New England's six public Land Grant universities, operating from the start in one of the most industrialized regions of the country, the Land Grant mandate has always been an invitation to expand and reach out.

Hoff points out that Land Grant Universities were "truly revolutionary" at their inception because they extended higher education to all who had the intellectual tools and preparation to benefit. Furthermore, they emphasized a research mission and an intention to reach out to help society solve its most pressing problems. "In 1865, those problems included agriculture to feed a nation devastated by the Civil War and mechanic arts—engineering—to help the country move into the industrial age," says Hoff.

Reaching out

The notion that Land Grants were focused solely on agriculture is belied by their history and even the enabling legislation itself, which aimed to nurture "such branches of learning as are related to agriculture and mechanic arts, in such manner as the legislatures of the state may respectively prescribe, in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life."

Today, Land Grants continue to extend access to university education at an affordable cost to people with limited means but academic potential and to conduct cutting-edge research. But as the needs of the citizens have changed, so have the Land Grant institutions.

Says Hoff: "The problems themselves have become more complex: economic development and the health of our population are at the top of our list [now] along with meeting the homeland security issues presented by 9/11."

As an example of a modern interpretation of the Land Grant role, Hoff cites UMaine's programs in advanced engineered wood composites, which aim to develop uses for wood from Maine forests that create jobs without hurting the environment. UMaine's work in chemical and biological sensors, useful for detecting dangerous chemical agents, has also has taken on new relevance because of terrorist threats.

Like its sister Land Grants created in response to the demands of a 19th century agrarian society, the University of Rhode Island in 1971 became one of the nation's first four Sea Grant universities and quickly made its presence felt in marine sciences and fisheries. Now, URI pursues state-of-the-art research and training programs for new industries such as biotech, which, in the form of giant companies like Dow and Amgen, have been expanding in the Ocean State. "We have not forsaken our agricultural roots; rather we have grown from them to encompass the new scientific and social challenges of the 21st century," says Jeffrey R. Seemann dean of URI's College of the Environment and Life Sciences.

Leaving His Stamp

Justin S. Morrill of Vermont began advocating for the Land Grant Act in the 1850s. The act's passage in 1862 provided a grant of 30,000 acres of public land for each member of a state's congressional delegation, to be sold to raise funds for the creation of agricultural and engineering colleges. A second act in 1890 extended the provisions of the legislation to former Confederate states. In 1962, the U.S. Post Office honored Morrill with a "Higher Education" stamp commemorating passage of the Land Grant Act.

John Mullin, vice president for university outreach at UMass also sees Land Grants operating on the cutting-edge of fields like biotech. UMass graduated 600 life science majors in 2001 and boasts an annual research budget of $250 million, more than half of which is in life sciences. UMass also recently launched new master's/Ph.D. degrees in biotech and biomedical engineering and is developing a $120 million R&D center in Worcester and $80 million vaccine manufacturing plant in Boston.

Furthermore, Mullin adds, "We no longer have legions of extension agents, but we do have people helping 40,000 at-risk kids and focused efforts in agricultural sectors like the cranberry industry." Indeed, he says UMass faculty are involved in more than 1,000 business, social and cultural projects across the state. "The Land Grant tradition is alive and well," he says, "but it isn't the same mission as a century ago."

Shifting priorities

Underscoring the shift in mission, NASULGC consultant Irvin T. Omtvedt, who is the emeritus vice chancellor for agriculture and natural resources at the University of Nebraska in Lincoln, notes that while U.S. Department of Agriculture funding to support scientists and extension educators at Land Grants declined

by 16 percent between 1988 and 1998, research funding from NASA and the National Institutes of Health grew by 58 percent and 43 percent, respectively.

Although federal R&D funding to research universities keeps growing, state tax support for Land Grant operations has been historically low and periodically slashed due to budget crises. Last year, every New England Land Grant suffered either reductions or rescissions. If there is a silver lining to the dark fiscal cloud, it is that Land Grant institutions, which have always focused on collaborative partnerships, have had added incentive to work more closely with the private sector and with other institutions of higher education. The increasing complexity of problems also has led Land Grants to form interdisciplinary centers that cut across departmental and college lines to address their research and educational priorities. In biotech, for example, agricultural scientists work increasingly in teams with biologists and engineers from other departments or other institutions entirely.

Despite their financial instability, Land Grant institutions remain better suited to solve many state problems than other private or governmental institutions. Says UMaine's Hoff: "They are usually in a stronger position to respond."

Hoff notes that businesses in fields from aquaculture to electronics work with UMaine because of its Land Grant and Sea Grant affiliations. Cheryl Timberlake, executive director of the Biotechnology Association of Maine, says university contributions to Maine's biotech industry range from research collaborations to UMaine researcher Michael Vayda's significant volunteer involvement on industry panels.

More traditional Maine industries such as agriculture, forestry, marine science and engineering also work extensively with the university. For example, the Irving Chair in UMaine's College of Natural Sciences Forestry and Agriculture, is funded by an endowment from J.D. Irving Ltd., a private, family-owned forest products company based in the Maritime region of eastern Canada. Last year, after a national search, UMaine appointed Jeremy Wilson, a specialist in the application of computer mapping and modeling technology to forest management, to fill the position. The Pulp and Paper Foundation, meanwhile, focuses its philanthropy on UMaine because of the top-grade scientists the Land Grant makes available for that industry.

In its broader effort to help new business, UMaine recently opened the Target Technology Center in Orono. With a focus on information technology, the center is a part of the State of Maine's network of seven technology incubators. Other facilities specialize in aquaculture, composites, biotechnology and environmental monitoring.

"Our strategic initiative in information science (IS) across the university has helped promote relationships with software developers and many industries that rely on graduates with IS skills," says Hoff. And of course, there is the Maine potato. Vayda, the assistant director of UMaine's Forestry and Agriculture Department, notes that researchers have had a tremendous impact on the potato industry, developing new cultivars and finding new storage techniques that help bring more of the crop to market. They have also helped growers control insect pests, particularly the Colorado potato beetle, using integrated pest management programs, and developing new ways to control insects with less dependence on traditional insecticides.

Seemann at URI says businesses beat a path to the doors of Land Grants because they know they can get high-quality, independent information at lower cost than they would by contracting with other types of organizations. They can also get well-educated workers. Valerie Gamble, the training manager at Amgen, the West Greenwich, R.I., biotech firm, says the university's biotech graduates will be an important factor in the industry's success in Rhode Island. "With my colleagues, I am helping URI design a biotech curriculum that will prepare students for the real-world needs of the industry," she says.

A new Land Grant Act?

In 2000, NASULGC and the W.K. Kellogg Foundation issued a report calling for a renewal of the historic "covenant" between the American people and their public colleges and universities. Among other things, the commission called for a Higher Education Millennial Partnership Act. The proposed legislation would provide funding for Land Grants and the other public campuses. In return, the public universities would commit to providing genuinely equal access to students of all ages and backgrounds, as well as "conscious efforts to bring the resources and expertise at our institutions to bear on community, state, national and international problems in a coherent way."

Land Grants, for their part, want to be sure that any new legislation comes with funding. John Bramley, senior vice president and provost at the University of Vermont, says he would not favor any new legislation that doesn't provide additional resources.

If there seems something too gimmicky about new Land Grant acts and new G.I. Bills, Hoff doesn't see it. "It makes sense for America to renew its covenant with higher education, as it has in the past with Land Grant legislation, investment in university extension, creation of and investment in historically black and other minority institutions, the G.I. Bill and widespread federal aid to needy students," he says. "Millennium Land Grant legislation and investment in technology represent the logical next steps in our nation's pioneering approach to higher education."

The Land Grant concept will continue to shape the role of public universities in the economic development of their states. Says Omtvedt: "The Morrill Act is as relevant in the 21st century as it was in 1862, and our challenge is to ensure that the Land Grant institutions continue to change to keep abreast of the changing needs of the citizens they serve."

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