

An American Education

Democracy and the Birth of the Land-Grant College

How did America's schools of science and engineering come to be? When did technical education begin to supplant the liberal arts in U.S. colleges and universities? The familiar version of this story tells of the emulation, in America, of the German university system. But that account does not explain the distinctive character of higher education in

the United States—not just scientific, but practical and democratic. In particular, it leaves out the crucial role of the peculiarly American institution called the land-grant college.

America's earliest system of higher education could be found in colonial-era schools like Harvard, Princeton, and Yale. Those colleges were affiliated with, or at least loosely connected

to, various religious denominations. Within their walls, students could receive an education in religion, classical languages, or the liberal arts that was broadly in keeping with traditions that can be traced back to the earliest universities established in medieval Europe.

That traditional mode of education sat uncomfortably with the restless and practical nature of the American character that was increasingly asserting itself in the early nineteenth century. In 1828, the faculty of Yale, opposing the growing popular demand for more practical higher education, published a vigorous defense of the college's traditional curriculum. The purpose of classical pedagogy, the Yale professors wrote, was laying "the foundation of a superior education," a foundation in literature and science that was common to medicine, law, and theology. But the faculty did admit to adding sciences with obvious practical applications, such as chemistry, mineralogy, geology, and political economy, and claimed that a Yale education prepared undergraduates for the post-college pursuit of not just professional employment (such as medicine and the law) but also practical employment ("mercantile, mechanical, and agricultural"). Given the interconnectedness of knowledge—"every thing throws light upon every thing"—even the more theoretical aspects of a Yale education could aid in the development of practical skills.

A few years later, when Alexis de Tocqueville visited the young nation, he wondered whether a democracy

could sustain the art, literature, and even basic sciences that were possible in a more aristocratic Europe. "Nothing is more necessary to the cultivation of the advanced sciences or of the elevated portion of sciences than meditation, and there is nothing less fit for meditation than the interior of a democratic society," he wrote in *Democracy in America*. In a democracy, "everyone is agitated"—a state that hardly seems conducive to the reflection the sciences require. But Tocqueville was not without hope for science in America. He expected that democracies would immensely increase the number of people cultivating the sciences. Moreover, the democratic "taste for practice"—that is, for practically applied knowledge—"will bring men not to neglect theory," since the two are, in the modern age, inseparable. Indeed, around the same time Tocqueville was writing, Ralph Waldo Emerson was calling for a union between theory and action in his famous "American Scholar" lecture at Harvard: "Action is with the scholar subordinate, but it is essential. Without it, he is not yet man. Without it, thought can never ripen into truth."

By the middle of the nineteenth century, a new generation of reformers began to believe that a thorough makeover of U.S. higher education was necessary to better prepare students from a wide cross-section of the population for practical employment. They began to consider the model of Germany's universities, which differed from American schools in curriculum

(science was emphasized to a much greater degree), pedagogy (lectures were more common), and original research (the production of new knowledge was central).

Generally speaking, historians of higher education have described the evolution of the American university in the nineteenth century as an alloying of the modern German model and the older classical model. And it is true that American schools did adopt some of the dynamic and utilitarian practices of the German system. But the German university was far more dedicated to extending theoretical Enlightenment science than it was concerned with the practical application of that science. "The university instruction of Germany does not attempt to train successful practical men, unless it be indirectly," wrote one observer in 1874. "Its chief task, that to which all its energies are directed, is the development of great thinkers, men who will extend the boundaries of knowledge." A decade later, another writer argued that Germany had "made profound scholars in the technical sciences" but "failed to develop great men in the affairs of life or of state"—and finally "spent itself in the solution of abstract questions until Germany retrograded into absolute and iron monarchy." In a word, the failure of German democracy could at least in part be chalked up to German universities' indifference to the practical. By contrast, U.S. universities demanded that science be practical, a fact that both resulted from and reinforced the American democratic spirit.

A key figure in adapting the German model to suit the American taste for practicality was Jonathan Baldwin Turner. Born in Templeton, Massachusetts in 1805, he studied at Yale and served from 1833 to 1848 as a professor at the classical sectarian Illinois College. Turner became convinced that new universities were needed "to apply existing knowledge directly and efficiently to all practical pursuits and professions in life, and to extend the boundaries of our present knowledge in all possible practical directions." He began his campaign with an attack on the classical colleges. By focusing on books and languages, he argued, those schools train their students' minds to have "undue deference to the authority of the book, with little capacity to look after the fact." A proper state of education is "less from books and the laws of verbiage, and more from facts and the laws of God." Even though he himself was educated at a classical college, Turner saw it as a pedantic "agonism at verbiage."

The opposite of verbiage was action. "Motion—progress—is the law of matter and of mind; and all civilization, all true Christianity, all true education and all true manhood, are nothing but one everlasting progress in true knowledge, wisdom and virtue." Turner echoed Tocqueville's and Emerson's notions of action and progress, but went further, saying that "the effort should be made to make each man an intelligent, thinking man, in his own profession in life, rather than out of it." He also connected eighteenth century Enlightenment thought

with the emerging technologies of the nineteenth century, anticipating a body of useful knowledge completely different from the classical norm.

Turner's ideas found a political champion in Justin Smith Morrill, born the son of a Vermont blacksmith in 1810. As a young man, Morrill told his father he wanted to attend college. His father replied, "I can afford to send you, but I do not know as I could the other boys. Think it over and see what you think best." Morrill would later tell a group of students, "It was a great disadvantage to me that I could not go to school."

Rather than attend college, Morrill started working as a clerk in a store, educating himself through voracious reading. The owner took Morrill under his wing and eventually made him a partner. By the time Morrill was thirty-eight, he had retired to become a gentleman farmer. But agriculture alone could not occupy all of his attention: he began to attend local and state political meetings and to read politics and economics. In 1854, he was elected to Congress as a Free Soil Whig. Representative Morrill wanted to ensure that future sons of the industrial class could afford the higher education of which he had been deprived. Influenced by Turner's agitations, Morrill wanted to create new schools that made practical use of science, which he saw not as "a goddess in the clouds, to be worshipped only by fanatics and afar off" but rather as "a handmaid, beautiful, and busy everywhere at saving labor and capital."

In April 1858, Representative Morrill introduced a bill that sought to create new schools along the lines Turner had called for. The legislation even offered a clever approach to funding the schools, an approach that Turner had proposed. It provided for a certain amount of western land (thirty thousand acres) to be apportioned to states for each member of Congress. Populous eastern states such as New York and Massachusetts would thus receive more land than states like Iowa and Minnesota. The states would be issued paper scrip that could be sold on the open market. The states could invest the capital however they wished, so long as some of the proceeds were used to establish or maintain "at least one college where the leading object shall be, without excluding other scientific and classical studies...to teach such branches of learning as are related to agriculture and the mechanic arts, in such manner as the legislatures of the States may respectively prescribe, in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life." By accepting the land grants, the states agreed to compensate the college fund for any investment losses in capital. Although the money could be used to purchase land for experimental farms, it could not be used to erect buildings. If the states did not begin practical instruction within five years of accepting the grant, they would have to repay the federal government. Finally, an annual report "recording

any improvements and experiments made" would be "transmitted by mail free...to all the other colleges which may be endowed by the provisions of the act."

Although Congress passed Morrill's bill in 1859, President Buchanan vetoed it. Three years later, however, a new Congress passed the bill again, and a more sympathetic president, Abraham Lincoln, signed it into law. Within months, the states began establishing new colleges to receive the land-grant funding.

In the late 1860s, as the first land-grant schools were founded, the prominent American educator Daniel Coit Gilman—who founded and presided over several of the nation's foremost universities—stated that the purpose of the land-grant colleges was to train "leading scientific men." By that, he meant not theoreticians or laboratory researchers but rather men who could "take charge of mines, manufactories, the construction of public works, the conduct of topographical and other scientific surveys." This emphasis on practical education was clearly quite distinct from the purely technical approach of the German model. And the schools were remarkably democratic from the beginning—a fact ensured by the political muscle of the populist Grange movement, which expected that the land-grant schools would educate farmers' sons to return to the farm.

Land-grant universities were central to two subsequent critical developments in American education. First,

in the years immediately following the Civil War, engineering education exploded in the United States. In 1866 there were only 300 men with engineering degrees and only six colleges of any repute granting them. By 1870, led by the new land-grant schools, there were 866 graduates. By 1911, the United States graduated 3,000 engineers a year and had a total of 38,000 in the workforce. Second, the land-grant schools' practicality made their scholarship useful to the new businesses launching in the industrializing nation. By the dawn of the twentieth century, as industrial production became "more scientific, the bonds between the engineering school and the industries" became much closer, as a 1918 study described it. In time, it was "generally recognized that intimate cooperation between the business man and the teacher is of the greatest benefit to both."

Today, land-grant schools account for only about 6 percent of the one thousand schools considered by *U.S. News & World Report* in a recent ranking. Yet of the nation's top fifty engineering schools, nearly half owe a debt to the Morrill Act. The vast majority of the nation's land-grant schools rank among the world's top five hundred universities, meaning that some 95 percent of the U.S. population can be said to have in-state access to world-class learning in the applied sciences.

Much of America's industrial strength, technological innovation, economic productivity, military might, and civil infrastructure can be attributed to the

nation's land-grant schools. But those schools did not create from scratch the American attitude of receptiveness toward science and technology—they were themselves a consequence of it. Just as envisioned by Turner and Morrill, our land-grant schools are living expressions of the irrepressible

spirit of democratic practicality that Tocqueville observed. That these uniquely American institutions continue to thrive is a happy indication that the spirit remains alive and well.

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