

From Bacon to Bush (Vannevar, not G.W.): Common Ground Between Useful Knowledge and Red Brick Institutions

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Abstract

The theory about the power of useful knowledge to improve the human condition was published in Francis Bacon's *Novum organon* and his *New Atlantis* in the seventeenth century. The connection between useful knowledge and red brick institutions from University College in London to Framingham State College and MIT in Massachusetts began in the nineteenth century and continues to this date. University College London was founded in 1826. The useful-knowledge connections across the Atlantic began approximately ten years later with a gift of \$10,000 from a New England industrialist and a matching grant from the Commonwealth of Massachusetts. The sum funded the first public teacher training school in the United States. In 1889, a Boston newspaper headlined "Its Semi-Centennial, the Oldest Normal School in America, Framingham [State College] Thronged with Alumni and Friends." That year also marked the loss of a valued member of the faculty, Professor Atkinson from the Massachusetts Institute of Technology.

The Commonwealth had enacted legislation to incorporate MIT in 1861. Nor was Atkinson the only link between Framingham State College and the Massachusetts Institute of Technology. There would be others including Vannevar Bush. After earning his doctorate in engineering at MIT, Bush joined its Electrical Engineering Department. As a young professor in the 1920s, he built the most powerful computer in the world and co-founded Raytheon Company. The latter engineered the NASA (National Aeronautics and Space Administration's) guidance and navigation system that made it possible for the first man to walk on the Moon and return safely to Earth. In his 1945 essay "As We May Think", Bush urged the "men of science" to take up the task of making "more accessible our bewildering store of knowledge." His biographer has written that Bush's words "contained the germ of what would become the Internet." In 1970, Framingham State College's most famous graduate Christa Corrigan McAuliffe received her bachelor's degree in education. Sixteen years later, the teacher-astronaut joined her Challenger colleagues on a NASA mission from Earth to the Moon. The McAuliffe Center for Education and Excellence at FSC is dedicated to her spirit. Its motto is a quote from the teacher-astronaut: "I Touch the Future...I Teach." For more information, one can link to www.christa.org and follow what MIT's Vannevar Bush called "associative trails" to connect useful knowledge and red brick institutions.

Introduction

Historically speaking, connections between useful knowledge and red brick institutions were advocated by Sir Francis Bacon (1561-1626) as early as 1620 in his *Novum organon*. The text and the title were originally written in the language of the learned at the time. In the English translation, the Cambridge University graduate, jurist, and member of the court of Elizabeth I wrote: "The true and legitimate goal of the sciences is to endow human life with new discoveries and resources.... Just let man recover the right over nature which belongs to him by

God's gift, and give it scope; right reason and sound religion will govern its use.”¹ According to Bacon's *The New Method*, useful knowledge is the link between science and religion.

Some three hundred years later, after earning his doctorate in engineering from the Massachusetts Institute of Technology in 1916, Vannevar Bush joined its Electrical Engineering Department and later served as Vice President and Dean of Engineering at MIT. In 1922, he co-founded Raytheon Company. During NASA's 1969 Apollo Mission, the guidance and navigation system designed by MIT and built by Raytheon made it possible for the first man (Neil Armstrong) to walk on the Moon and return safely to Earth.² In his 1999 biography, *Endless Frontier: Vannevar Bush, Engineer of the American Century*, G. Pascal Zachary wrote that even though Bush had “designed the world's most powerful mechanical calculators in the 1930s, laying the groundwork for the advent of the digital computer and the information revolution,” he is probably best known for his World War II service as Director of President Franklin D. Roosevelt's Office of Scientific Research and Development. “At the age of 57, he personified military research in America and was the most politically powerful inventor in America since Benjamin Franklin.” However, it was his post-War, 1945 report “Science—the Endless Frontier” that encouraged public funding for university scientific research in the United States. And, that same year, in his *Atlantic Monthly* article “As We May Think,” Bush “predicted that new technologies would someday deliver an unprecedented ability to receive and manage information, thus improving the quality of life in untold ways.” According to his biographer, Bush's “words contained the germ of what would become the Internet and won him

¹Francis Bacon, *The New Organon*, ed. and trans. Lisa Jardine and Michael Silverthorne (Cambridge: Cambridge University Press, 2000), Book I, aph. 81 and aph. 129 (end) cited in Peter Dear, *Revolutionizing the Sciences: European Knowledge and Its Ambitions, 1500-1700* (Princeton, New Jersey: Princeton University Press, 2001), 61.

² “MIT and Project Apollo” online: <http://libraries.mit.edu/archives/exhibits/apollo/index.html>.

a posthumous reputation as the sage of cyberspace” (Zachary 1999, 2-3).³ Although never built, the design Vannevar Bush called “Memex” encouraged the construction of the World Wide Web’s hypertext technology that makes browsing the Internet faster, more interactive. “Bush laid the blame on librarians for the growing inability to find relevant information swiftly.... Rather than fixed indexes, Bush envisioned flexible ones, along the lines of the ‘associative trails’ that he described in his “As We May Think” article.” As the author explained, “[t]hese dynamic indexes would evolve on the fly, becoming personalized. The building block of this new organizing scheme was the ‘key word.’ Each document would contain at least one key word and probably more” (Zachary 1999, 272).⁴

What Vannevar Bush called “associative trails,” we can access via hypertext links to “useful knowledge” and “red brick institutions.” Although the latter were not incorporated until the nineteenth century, they had been envisioned two hundred years earlier when the Englishman Sir Francis Bacon proposed “the establishment of state institutions that would be dedicated to improvements in the crafts and trades” (Dear 2001, 57). As early as 1605, in his *Advancement of Learning*, Bacon introduced his useful knowledge campaign. Fifteen years later, in *The New Method*, he would denounce the Aristotelian natural philosophy curriculum taught at the universities in his day for its “contemplative ideal.... Instead, he held that natural philosophy, properly understood, should be directed towards achieving improvements in the well-being of

³ “Bush Symposium Information: As We May Think”—A Celebration of Vannevar Bush’s 1945 Vision, An Examination of What Has Been Accomplished, and What Remains to be Done” online: <http://www.eecs.mit.edu/AY95-96/events/bush/>. Scroll down the “Agenda” for Thursday, October 12th to the 2:30 PM presentation by Tim Berners-Lee, the Queen’s College Oxford University inventor of the World Wide Web. Click on Abstract and then Biography. It should also be noted that Berners-Lee was awarded a knighthood for his pioneering work in April 2007.

⁴ An April 1994 electronic version prepared by Denys Duchier, University of Ottawa, (<http://www.ac-creteil.fr./util/programmation/html/html/docs.vbush.htm>) of *The Atlantic Monthly*, July 1945 “As We May Think” article includes the editor’s introductory remarks in which the latter concludes: “Like Emerson’s famous address of 1837 on ‘The American Scholar’, this paper by Dr. Bush calls for a new relationship between thinking man and the sum of our knowledge’.” See footnote 12 reference in this paper on “From Bacon to Bush...” for additional reference to Emerson.

humanity - what we would nowadays think of as technological advances....” For Bacon, “[n]ovelty was an important feature...since it was new discoveries that he sought...” As far as he was concerned, “[t]he fault of the Aristotelians lies above all in their misconstrual of the *purpose* of natural philosophy. To show contempt for practical knowledge, the sort that can provide humanity with a better life, is to act immorally. Bacon expresses his view using a Christian idiom...[that is] Aristotle’s unproductive philosophy is a dereliction of the Christian duty of charity towards others”(Dear 2001, 57-59, 61). In 1627, a year after Bacon’s death, his *The New Atlantis* was published. According to the “Introductory Note” in the online Harvard Classics Edition, “[n]one of Bacon’s writings gives...so vivid a picture of his...aspirations” as “this fragment of ... [his] plan of an ideal commonwealth [my underline]...” In particular, there is Bacon’s description of his pioneering university, the one he called “Solomon’s House.” Here, “we have Bacon the scientist indulging...his prophetic vision of the future of human knowledge....”⁵

Benthamites, Useful Knowledge, and University College London

What Bacon imagined in his *New Atlantis*, Benthamites⁶ institutionalized in 1826 when the first red brick college was founded. According to the University College of London website, “UCL

⁵ “Introductory Note” and “Para[graphs] 60-91” from Bacon, Francis. *New Atlantis*, online: <http://www.bartleby.com/3/2/1001.html>. In paragraphs 60 through 91, Bacon described various departments and functions of his visionary university. For example, “[w]e have also engine-houses, where are prepared engines and instruments of all sorts.... We have also a mathematical house, where are represented all instruments, as well of geometry as astronomy, exquisitely made.... For the several employments and offices of our fellows; we have twelve that sail into foreign countries...who bring us the books, and abstracts, and patterns of experiments.... These we call Merchants of Light.... Lastly, we have three that raise the former discoveries by experiments into greater observations, axioms, and aphorisms. These we call Interpreters of Nature.... [And Bacon adds] we have circuits or visits of divers principal cities of the kingdom; where...we do publish such new profitable inventions as we think good.”

⁶Benthamites, also known as Utilitarians, were “a small group of well-educated people who followed the ideas of Jeremy Bentham (1748-1832).... When Bentham died, he was one of the first men deliberately to leave his body to science; his mummified form resides to this day in the entrance hall of University College, London.

Bentham...was a man of the age of reason, and the object of his lifetime was to put the institutions of his day to a simple test: is it useful?... And for Bentham those institutions were useful that promoted the greatest happiness of

was the first university to be established in England after Oxford and Cambridge, providing a progressive alternative to those institutions' social exclusivity, religious restrictions and academic constraints." Furthermore, the hypertext history recalls that University College London was the "first university in England to admit students of any race, class, or religion, and the first to welcome women in equal terms with men." As for its curriculum, academic "disciplines [were] introduced as required by the emerging industrial and commercial society...." Two years later, in 1828, "[t]wenty-four faculty positions were established, many in subjects not previously taught at traditional English universities."⁷ By linking to "Jeremy Bentham and UCL," one learns that he "is often credited with being one of the founders of the University of London, the forerunner of today's University College London. This is not, in fact, true. Bentham was eighty years of age when the new University opened its doors in 1828, and took no part in the campaign to bring it into being.... [Evenso, as the author of utilitarianism,] he still deserves to be considered as its spiritual father. Many of the founders, particularly James Mill (1773-1836) and Henry Brougham (1778-1868), held him in high esteem, and their project embodied many of his ideas on education and society."⁸

As for Mill and Brougham who are recognized as "founders" of the University of London, they also played a leading role in the passage of the 1832 Parliamentary Reform Bill that enfranchised British middle-class men. Along with Henry Brougham who served as Lord Chancellor in Earl Grey's Whig ministry (1830-1834), James Mill was a leader of the contingent of Whigs, Benthamites, and businessmen who are credited not only with the establishment of University College London but also with the beginning of the nineteenth-century Parliamentary

the greatest number of people." Walter L. Arnstein, *Britain Yesterday and Today: 1830 to the Present*, 4th ed., (Lexington, Massachusetts: D.C. Heath, 1983), 46.

⁷"History of UCL," online: <http://www.ucl.ac.uk/about-ucl/history>

⁸"Jeremy Bentham and UCL," online: <http://www.ucl.ac.uk/about-ucl/history/bentham>.

reform movement that eventually democratized the suffrage in Great Britain. It is worth noting that they were University of Edinburgh graduates, attended the University at about the same time, and subsequently came to London. Mill arrived in 1802; Brougham, the following year. During the next thirty years, they were leaders in the Benthamite movement to reform British education so that its institutions passed the “test of utility.” For these Utilitarians, the “greatest happiness of the greatest number” would measure the success of their useful-knowledge campaign.

In addition to their support for University College London, James Mill was a member of the Society for the Diffusion of Useful Knowledge. Brougham was in charge. At a public meeting in London in 1825, a meeting at which plans were still being discussed for the establishment of University College London, he told the assembled: “...to teach your bricklayer, your carpenter, and your labourer, to reason and argue on principles of science, while you who employed them, remained ignorant of those subjects of improvement, would be not only, the most absurd, but the most mischievous thing that could be done” (Kelly 1957, 153). Brougham was referring to the mechanics’ institute movement associated with the introduction of the factory system of manufacturing in England during what has been called “The First Industrial Revolution.” According to the 1826 *Prospectus* of the Society for the Diffusion of Useful Knowledge, the goal was “the imparting of useful information to all classes of the community, particularly to such as are unable to avail themselves of experienced teachers, or may prefer learning by themselves.”⁹ A decade later, the general committee of the SDUK, with its central office at University College London, had established approximately ninety local committees with a total of some two hundred members. They were located throughout Britain not only at the traditional universities

⁹ That *Prospectus* along with two hundred volumes and twenty-one boxes of material documenting the history of Brougham’s Useful Knowledge Society are in the Ogden Room of the UCL Library.

(i.e., Oxford, Cambridge) and at such ancient Scottish institutions as Edinburgh and Glasgow but also in new industrial locations like Birmingham, Bristol, Leeds, Liverpool, Manchester, and Sheffield where mechanics institutes predate the six red brick universities that were founded in the Victorian era.¹⁰ The preceding list of sites where the Society for the Diffusion of Useful Knowledge had local committees is not meant to be definitive, just suggestive of the network on which Brougham's general committee in London relied for authors to write and useful knowledge advocates to market the Society's "cheap and useful" publications. Beginning with its *Library of Useful Knowledge* and *Library of Entertaining Knowledge*, the SDUK published more and more series including (to recall but a few) *The Penny Magazine* and *The Penny Cyclopaedia* as well as its *Farmer's Series*, *Working_Man's Companion*, *A Manual for Mechanics' Institutions*, *Quarterly Journal of Education*, and *British Almanac*. By 1846, there was not enough money from subscribers to finish what would be the final series, that is, its *Biographical Dictionary*. Brougham wrote to the then Conservative Prime Minister Robert Peel asking for a government subsidy. The latter replied, "I regret that I cannot consistently with my sense of duty accede to the proposal which you transmitted to me for a large annual grant to the S.D.U.K."¹¹ Two years later, in 1848, the Society for the Diffusion of Useful Knowledge went out of business.

Commonwealth of Massachusetts Connections: FSC and MIT

¹⁰ According to the popular website, online: <http://en.wikipedia.org/wiki/Redbrick>, "University College London itself, and colleges from the 19th and early 20th centuries which later achieved university status prior to 1963, are also sometimes described as 'Red Brick'; this broader designation includes institutions such as the University of Exeter..., Newcastle University..., and the Universities of Hull, Leicester, Nottingham and Southampton (until the 1950s, all were colleges with degrees being awarded by the University of London)."

¹¹ Peel Papers. Add. MSS. 40482, ff.82-92 cited in Elaine Storella, "*O, What a World of Profit and Delight*": *The Society for the Diffusion of Useful Knowledge*, Ph.D. diss., Brandeis University, 1969 (Ann Arbor, Mich.: UMI, 1969), 252.

Forum on Public Policy

While there was a local chapter of the SDUK in Boston, the lasting impact of the useful knowledge campaign across the Atlantic in the Commonwealth of Massachusetts involved a \$10,000 gift from the industrialist Edmund Dwight, a matching grant from the state government, and the leadership of Horace Mann (1796-1859).¹² “When he was elected...Secretary of the newly-created Massachusetts Board of Education in 1837, he used his position to enact major educational reform.... Mann was influential in the development of teacher training schools and the earliest attempts to professionalize teaching.... [And]...in 1838, he was crucial to the actual establishment of the first Normal Schools in Massachusetts.... [The latter were] part of Mann’s... determination to create a system of effective, secular, universal education in the United States.”¹³

Two years later, in the 1840 *Fourth Annual Report of the Board of Education Together with the Fourth Annual Report of the Secretary of the Board* and with regard to “A Knowledge of Common-School Subjects,” Horace Mann emphasized that teachers “should have a perfect knowledge of the rudimental branches which are required by law to be taught in our schools.... Teachers should be able to teach subjects, not manuals merely.” He pointed out that “[h]owever much other knowledge a teacher may possess, it is no equivalent for a mastership in the

¹² “The winter and early spring of 1835...brought new intellectual heat to Boston. In January,...Emerson began his first series of...lectures...sponsored by Boston’s Society for the Diffusion of Useful knowledge and delivered to full audiences in the main hall of the Masonic Temple.... [Two years later, Emerson gave] the Phi Beta Kappa oration at Harvard’s commencement.... Horace Mann, now the actively proselytizing secretary of the state board of education, would be there in Cambridge’s First Parish Church to hear him, along with Oliver Wendell Holmes.... ‘The American Scholar,’ as Emerson titled the speech...pointedly omitted any acknowledgement of Harvard’s role in educating the rising generation. Rather it was an impassioned appeal to the individual man—any man—to ‘plant himself indomitably on his instincts, and there abide.’ The speech was a hymn to self-education, to the scholar as a man of action, and an implicit denunciation of life within the academy. Oliver Wendell Holmes would later call it ‘our intellectual Declaration of Independence.’” Megan Marshall, *The Peabody Sisters: Three Women Who Ignited American Romanticism* (Boston, New York: Houghton Mifflin Company, 2006) 298, 338-339.

¹³ According to the Public Broadcasting System website, online: <http://www.pbs.org/onlyateacher/horace.html>, Horace Mann “spearheaded the Common School Movement, ensuring that every child could receive a basic education funded by local taxes. His influence soon spread beyond Massachusetts as more states took up the idea of universal schooling.... Mann believed that public schooling was central to good citizenship, democratic participation and societal well-being.... ”

Forum on Public Policy

rudiments.” In his words, “[i]t is not more true in architecture, than in education, that the value of the work, in every upper layer, depends upon the solidity of all beneath it.” According to the first Secretary of the Board of Education in Massachusetts, “[t]he leading, prevailing defect in the intellectual department of our schools, is a want of thoroughness;—a proneness to be satisfied with a verbal memory of rules, instead of a comprehension of principles—with a knowledge of the names of things, instead of a knowledge of the things themselves....” Mann added that “...if some knowledge of the things is gained, it is too apt to be a knowledge of them as isolated facts, and unaccompanied by a knowledge of the relations, which subsist between them, and bind them into a scientific whole.” Mann cautioned that “[t]hat knowledge is hardly worth the name, which stops with things, as individuals, without understanding the relations, existing between them. The latter constitutes indefinitely the greater part of all human knowledge.” To emphasize and illustrate his meaning, he wrote that “[w]ith the exception of the comets, whose whole number is not known, there are but thirty bodies in the whole solar system. Yet, on the relations which subsist between these thirty individual bodies, is built the stupendous science of astronomy. How worthless is the astronomical knowledge which stops with committing to memory thirty names!” At this point in his 1840 *Fourth Annual Report*, Horace Mann wrote that the “aptness to teach...comprehends many particulars. The ability to acquire, and the ability to impart, are wholly different talents. The former may exist in the most liberal measure, without the latter.” And here, Mann recalls “a remark of Lord Bacon, that ‘the art of well-delivering the knowledge we possess is among the secrets, left to be discovered by future generations’.” (Mann 1840, 48-51).

Two years earlier, on April 19, 1838, the Governor of Massachusetts had signed the “historic measure... inaugurating an American educational revolution.” The Board of Education,

Forum on Public Policy

reinforcing that theme, decided to locate the first normal school in the United States “on the northeast corner of the famous Common” in Lexington where the American Revolutionary War of Independence had begun on April 19, 1775. The revolutionary rhetoric called attention to contrasts between the Massachusetts experience that began on July 3, 1839 in Lexington and the European tradition. There, normal schools admitted young men. In the Commonwealth, the plan was to educate young women who would not have to pay tuition if they intended to teach in the public schools. Nor would there be either religious tests for admission or sectarian instruction. Instead, the Normal School curriculum introduced in Lexington by its first principal, the former Nantucket High School headmaster and Unitarian minister, Cyrus Peirce (and subsequently added to by his successors) included instruction in “reading, writing, arithmetic” as well as in “composition, algebra, geometry, geography, physiology, intellectual and moral philosophy, natural history, botany, political economy, federal and state government, book-keeping, vocal music, and, of course, pedagogy.” And, from the beginning, the curriculum included a model school as a practicum for future teachers. Additionally, “‘Father’ Peirce (as the students called him) began each day with a Bible reading and, [he, explained to his students, with] ‘remarks on points of practical duty, as far as I can go on common ground’.” Because of the religious controversy between Calvinists and Unitarians in the Commonwealth, the Massachusetts legislature had enacted an 1827 statute that made it illegal to teach religion in the public schools from a sectarian point of view (Nutting 1989).¹⁴

While the history of Framingham State College began in Lexington in 1839, twice the Normal School “outgrew its facilities, moving first to West Newton in 1844 and finally in 1853 to its permanent location in Framingham. A suitable location of five and three-quarter acres on scenic

¹⁴Nutting, P.B., B. Weiss, *et al.*, *Pioneers in Education: A History of Framingham State College: Celebrating One Hundred Fifty Years of Excellence in Education 1839-1989*. Special Collections & College Archives, Henry Whittemore Library, Framingham State College.

Forum on Public Policy

Bare Hill...was offered by the Town. With appropriations from Framingham, the Boston and Albany Railroad, and the Massachusetts Legislature, a new school building...was constructed. The building was “dedicated and opened on December 15, 1853. The School’s motto ‘Live to the Truth,’ was inscribed in black and gold lettering on the new building. This motto derived from Cyrus Peirce’s standard statement upon closing his lessons at the end of each day.”¹⁵

In the period from the Normal School’s quarter-century celebration in 1864 to its fiftieth anniversary in 1889, graduates supported the activities of the Freedmen’s Bureau founded after the Civil War to supervise “all relief and educational activities relating to refugees and freedmen....”¹⁶ Among them, Lucretia Crocker was the most distinguished. She joined with Abby May, “later an official Visitor from the Board of Education to the Normal School at Framingham.” They also worked to create opportunities for women to study science.¹⁷

¹⁵ For the history of the College from its origin to the celebration of its sesquicentennial anniversary, online: <http://www.framingham.edu/150th/history.htm>. The latter includes photographs of FSC’s red brick buildings and an account of some of the students, faculty, and administrators who were part of Framingham State’s “pioneering” useful knowledge mission.

¹⁶ The Bureau “also assumed custody of confiscated lands or property in the former Confederate States, border states, District of Columbia, and Indian Territory.” See online:<http://freedmensbureau.com>.

¹⁷ Mrs. Ednah Dow *Cheney’s Memoirs of Lucretia Crocker and Abby W. May Prepared for Private Circulation at the Request of the Massachusetts School Suffrage Association* (Boston, 1893) is in the Collection Development Department at Widener Library, Harvard College Library, Harvard University. According to this source, Crocker was both a student and a teacher at the Normal School. “Geography, natural science, and mathematics were her specialties.... So it came to pass that, after leaving the impress of her unusual gifts and attainments upon the pupils of the Normal School, she was called to occupy the Chair of Mathematics at Antioch College.... Miss Crocker was progressive in her educational views, and she had very much at heart the promotion of scientific study in the schools. She valued it not alone as an acquisition of useful knowledge, but as a valuable means of mental culture.... She was an associate member of the Association for the Advancement of Science in 1876 and became a corporate member in 1885. As science had been considered as rather out of the range of women’s intellect, her influence in this direction was of great value to the general cause of women’s advancement, as well as to the schools.... [She was also chosen to serve] on the Committee of Teachers of the Freedman’s Society in 1866.... A very interesting and important part of Miss Crocker’s life was the work she did for the Southern freedmen during the eight or nine years, from 1866 to 1875.... She always looked forward to a true public school system to be sustained by the people of the South, and as much as possible by the colored people themselves.... Miss Crocker worked...for the Freedman’s Society as long as it could possibly be kept alive, being one of the Executive Committee who carried it on the last year, and finally wound up its affairs” (3,6,8-9,18, 26-27, 36).

Forum on Public Policy

Both Crocker and May were also acquainted with Samuel Chapman Armstrong, the founder of Hampton Normal Agricultural Institute in Virginia.¹⁸ However, it was Elizabeth Hyde, a new graduate from Framingham in 1875, who went to Hampton Institute where she assumed responsibility for its “model school for teachers in training” and stayed “more than thirty years teaching sewing and gardening as well as academic subjects, and eventually served as administrator....” Hyde was joined by other graduates from Framingham over the years and, in return, “some of the Hampton graduates came to Framingham to study.” Olivia Davidson was among them. After graduating with honors in 1881, Davidson “went to Tuskegee Institute in Alabama as its Lady Principal and as assistant to the founder Booker T. Washington. She taught mathematics and botany, and...kept her contacts with friends at the Normal School.... In 1886, Olivia Davidson married Booker T. Washington who [even after his wife’s death three years later] continued to visit Framingham and to bring the Hampton Quartette to delight the students and staff.... For its part, the School continued to sew clothing and to raise funds for Tuskegee well into the twentieth century” (Weiss 1989, 25-26).

On July 2, 1889, *The Boston Herald* newspaper headline read: “Its Semi-Centennial, the Oldest Normal School in America, Framingham [State College] Is Thronged with Alumni and Friends.” Unfortunately, the fiftieth-year celebration also recalled the loss of a valued “teacher and friend, Professor W. P. Atkinson from the Massachusetts Institute of Technology, for thirty years a lecturer in English Literature and a valued confidant at the School. His many gifts of books had helped to build the library.” The connection between Framingham State and MIT expanded “during the summer of 1898” when “the gymnasium in May Hall was converted

¹⁸ “Hampton Normal and Agricultural Institute was founded in 1868 by General Samuel Armstrong. He was interested in moral training and a practical, industrial education for southern blacks. In 1872, Booker T. Washington—who had [been] born a slave in Virginia—arrived at the school...and in 1881 Armstrong recommended Washington to head Tuskegee Institute in Alabama.... Both Hampton Institute and Tuskegee Institute trained ‘an army of black educators’...” online: <http://www.vahistorical.org/sav2003/hampton.htm>.

into laboratories for the new Household Arts Department. Frederic W. Howe, an instructor at Massachusetts Institute of Technology, was engaged to teach physics and chemistry...and Percy G. Stiles [also from MIT was employed to teach] physiology” (Weiss 1989, 32, 41).

Twenty-two years after the beginning of what is today Framingham State College, the Massachusetts Institute of Technology was incorporated in 1861. According to MIT’s website, “William Barton Rogers..., a noted geologist and educator...had a vision for a new educational model. He began to organize and promote his ideas for a ‘polytechnic’ institute as early as the 1840s....” In a letter dated 1846 written to his brother, Rogers explained that the “‘true and only practicable object of a polytechnic school is...the teaching, not of the minute details and manipulations of the arts, which can be done only in a workshop, but the inculcation of those scientific principles which form the basis and explanation of them, their leading processes and operations in connection with physical laws.’” Still later, in 1860, he put together a “30-page pamphlet titled *Objects and Plan of an Institute of Technology*.” His purpose was to convince the government of the Commonwealth of Massachusetts to provide public support, in general, and reclaimed marsh land in the Back Bay of Boston, in particular, for a “three-part institution [which would]...include a Society of Arts, a Museum of Arts, and a School of Industrial Science. That third component...would...have departments devoted to design, mathematics, physics, chemistry, and geology.” As in his earlier correspondence to his brother, William Barton Rogers emphasized that the object of the School of Industrial Science “would be...to provide a substantial and continuous course of teaching, while imparting a knowledge of the principles, facts, and processes connected with the Arts,[and] should cultivate the habits of observation and

exact thought, which are so conducive to the progress of invention and the development of intelligent industry’.”¹⁹

While the Baconian vision is obvious, the educational purpose that Rogers described in his 1846 letter to his brother about the “true and only practical object of a polytechnic school” and repeated in his 1860 pamphlet also recalls Horace Mann’s admonition in his 1840 *Fourth Annual Report of the Board of Education Together with the Fourth Annual Report of the Secretary* that the “prevailing defect in the intellectual department of our schools...is a proneness to be satisfied with a verbal memory of rules, instead of the comprehension of principles.... [Rather than learning or teaching isolated facts, Mann’s recommended pedagogy for Massachusetts public school teachers was] a knowledge of the relations, which subsist between them, and binds them into a scientific whole.” He cited Francis Bacon as his mentor (Mann 1840, 49-50).

Roger’s proposal “was introduced to the state legislature in 1860.... [A] year of support and defense of the plan ensued.” Finally, just before the Civil War divided the country into partisans of free-states and slave-states, the Commonwealth incorporated the Massachusetts Institute of Technology “for the purpose of instituting and maintaining a society of arts, a museum of arts, and a school of industrial science in connection with arts, agriculture, manufactures and commerce...” (Acts and Resolves of the General Court Relating to the Massachusetts Institute of Technology, Acts of 1861, Chapter 183, 1). With MIT formally chartered, William Barton Rogers served as its first President from 1862 to 1870.²⁰

The connection between Framingham State College and the Massachusetts Institute of Technology that began in the mid-nineteenth century and continued into the second half of the

¹⁹For more information about the mid-nineteenth century origins of MIT and its first president, see “William Barton Rogers: MIT’s Visionary Founder,” online: <http://libraries.mit.edu/archives/exhibits/wbr-visionary>.

²⁰ He accepted a second appointment from 1879 to 1881 “and ultimately died while on the podium at commencement in 1882.” See online, <http://libraries.mit.edu/archives/exhibits/wbr-visionary>.

twentieth century made the headlines once again. Only this time, the “common ground” was “outer space.” In 1970, the College’s most famous graduate Christa Corrigan McAuliffe received her bachelor’s degree in education. Sixteen years later, the teacher-astronaut joined the Challenger crew on their National Aeronautics and Space Administration mission from Earth to the Moon. Tragically, seconds after the 1986 launch, the Challenger space craft exploded.²¹ To appreciate the interactive nature the teacher-astronaut’s legacy, link to the online NASA affiliated Framingham State College Christa Corrigan McAuliffe Challenger Center for Education and Excellence at www.christa.org.²² Its motto is a quote from the 1970 graduate: “I Touch the Future...I Teach.” According to the College’s undergraduate catalog, “[t]he McAuliffe Center’s relationship with NASA gives teachers throughout New England access to the...[Agency’s] numerous space-related programs, including *Mission Mathematics and Liftoff to Learning. Building a Presence for Science*, a National Science Teachers Association program in which more than 150 Massachusetts science teachers facilitate the integration of science education standards into classrooms statewide...” (*Framingham State College Undergraduate Catalog 2006-2007*, 280).

In a March 2007 telephone conversation with Ray Griffin, the Director of the McAuliffe Challenger Center at FSC, he told me there is a Challenger Center at Leicester University in the UK. The Director of the Challenger Center at that red brick institution learned about the NASA Challenger program while he was studying at MIT.

Conclusion

As for the most recent connection between FSC and MIT, the May 2007 commencement speaker and recipient of an honorary Doctor of Science degree from Framingham State was Dr. Laurie

²¹ See NASA “Mission Archives” for specifics about the Challenger tragedy on January 28, 1986 online, http://www.nasa.gov/mission_pages/shuttle/shuttlemissions/archives/sts-51L_prt.htm.

²² “ENTER Christa Corrigan McAuliffe Center, Challenger Learning Center,” online: www.christa.org.

Hebert Boyer. She is a 1990 graduate of the College and a postdoctoral research fellow at the Whitehead Institute for Biomedical Research affiliated with MIT. The December 2006 issue of *Scientific American* named Dr. Boyer one of the “Scientific American 50” for her research in stem cell biology.²³ According to an interview in the FSC alumni magazine, “one of her most rewarding experiences is mentoring women students at MIT and nurturing their enthusiasm for science” (“Laurie Boyer, ’90 Named Leading Science Researcher,” *Framingham State College Winter 2007 Magazine*, 31). It should also be noted that the current and sixteenth president of the Massachusetts Institute of Technology is Susan Hockfield. She is the first woman to serve in that capacity. In her online “Message from the President,” Hockfield recalled that “[w]hen the Institute was established almost 150 years ago, science had essentially no impact on the curriculum that was followed by most American university students. Our first President, William Barton Rogers, envisioned a new kind of academic institution—one that could, as he put it, ‘serve the times and the nation’s needs.’... I believe the world has never needed MIT as much as it does now. The major challenges of our age are increasingly shaped by science and technology...”²⁴

On reflection, these latest connections between useful knowledge and red brick institutions are just the most recent evidence of the “associative trails” from Bacon to Bush...and beyond.

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²³ “Determining how an embryonic stem cell differentiates into mature cells might eventually allow development of methods to reprogram an adult cell. Those techniques might let the mature cell return to its pluripotent state, in which it is capable of turning into different cell types. Laurie A. Boyer and Richard A. Young of the Whitehead Institute for Biomedical Research and their colleagues demonstrated how three proteins control this process (54).”

²⁴ To access “Message from the President,” see online: <http://web.mit.edu/hockfield>.

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