In the late nineteenth century, Herbert Spencer’s famous question had particular poignance for higher education. A veritable explosion of knowledge challenged the concept that all students could share the same curriculum; depth and breadth were in tension. The ideal of producing, if not Renaissance men, at least graduates familiar with all branches of knowledge was increasingly threatened by the growth of information, a trend that demanded specialization.

The bachelor of arts curriculum at most colleges was based on a philosophy of higher education drawn from classical and medieval traditions. Princeton, Franklin and Marshall, and Bucknell based their bachelor of arts programs on the twin tenets of liberal education: that all students should be introduced to a common body of knowledge, and that these studies should establish a base of information and mental discipline that prepared students for career, culture, and piety.¹

In the antebellum United States these tenets of liberal education were expressed in wholly prescribed curricula dominated by classical language, philosophy, science, and mathematics. Rapid expansion of scientific knowledge, development of the social sciences, and the growing popularity of modern languages stretched the prescribed curriculum to the breaking point. Franklin and Marshall gave students no choice of course work until the 1890s. Bucknell and Princeton granted a limited number of electives in the upper-class years,

while retaining prescriptions for the first two years to guarantee a secure foundation of liberal studies and mental discipline before catering to student interests. Spokesmen for these three colleges universally condemned the free use of electives at Harvard, which, according to President David Jayne Hill of Bucknell, ignored "the skill and experience embodied in the established curriculum, by entrusting the choice of studies to the crude, the indolent and the inexperienced."^{2}

The elective "system"—really a nonsystem—was taken to its most extreme form at Harvard, where President Eliot abolished virtually all requirements. At Princeton, Franklin and Marshall, Bucknell, and Swarthmore, electives were incorporated within a more modest reform of liberal education. A central core of subjects continued to embody the belief that liberal education should impart a unified intellectual experience, with every subject integrated into an overarching worldview. Physics and metaphysics, for instance, were both expected to explain existence within the bounds of conventional Protestant thought. Combining this curriculum with a closely monitored campus life was designed to breed Christian scholars, or at least high-minded Christians.

Shortsighted materialism, rather than electives, was seen as the greatest obstacle to cultivating intellect and virtue. Material success was presumed to follow automatically in business and public service or, after further study, in law, medicine, and the ministry. Scientific studies were justified by their contribution to mental discipline and philosophical wholeness, rather than for production of chemists and engineers.^{3} Graduate schools and technical institutes were to fulfill that function. Since the study of any subject in the absence of liberal education could produce a narrow and perhaps irreligious mindset, liberal education had to remain separate from vocational study.^{4}

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2. Aubrey Parkman, "David Jayne Hill" (Ph.D. diss., University of Rochester, 1961), 41. Quote was in an article by Hill in the University Mirror in June 1888.
3. See, e.g., the remarks of Professor John Stahr in Franklin and Marshall College, Board of Trustees, Minutes (Franklin and Marshall Archives), 15 June 1886.
Advocates of liberal education believed they were holding off the rampant materialism and utilitarianism that threatened religion and scholarship. This feeling, perhaps a constant in higher education, was especially strong in the rapidly changing economic and intellectual climate after the Civil War. In this period Franklin and Marshall's catalog defensively asserted that, despite popular clamor for more practical education, "no experiment of this sort is felt to be the mission of Franklin and Marshall College," and that by no such compromise would it seek "public attention or favor." A few years later, after modest reforms, a college publication more confidently defended liberal education. "Now that the grand mistake of all this has come to be recognized it is pardonable to note how Franklin and Marshall never gave away to this pressure, nor receded an inch from her position of general culture and the true idea of liberal education." Liberal educators slowly added electives and new subjects, making these adjustments within the spirit of mental discipline, liberal culture, and religious stewardship.

The bachelor of arts requirements at Bucknell, Franklin and Marshall, and Princeton were variations on a common theme. Franklin and Marshall, the most traditional, offered a completely prescribed curriculum dominated by the classics; the names Livy, Xenophon, Horace, Cicero, Homer, and Plato dot the course titles. Students completed mathematics as far as integral calculus and took rhetoric, ancient and medieval history, and philosophy. Due to its Germanic heritage, Franklin and Marshall had always offered a modern language. Courses in English literature and art history recognized the humanities in modern form. Science commanded a major portion of the upper-class years, while a senior course in the "connection between Natural Science and Revealed Religion" sought to mitigate the possible inroads of naturalism and empiricism. The social sciences were represented by a course on political economy. Lectures on ethics

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and social sciences replaced the antebellum moral philosophy course as the culmination of the educational experience.

Franklin and Marshall students still took a totally prescribed curriculum in 1890. Electives were avoided by increasing the course load to nine per term in the 1870s and ten in the 1880s. Since most sciences were covered in one term, in-depth study was impossible. When students requested the introduction of French in 1889 the faculty agreed, but as an optional course beyond the required ten. The faculty preserved the principle of a unified curriculum while adding new branches of knowledge, but the model was stretched to the breaking point.7

Bucknell and Princeton reformed their curricula slightly to incorporate the expansion of knowledge more fully. Bucknell’s curriculum in the 1870s resembled Franklin and Marshall’s, except students only took five or six courses, supplemented by weekly lectures on other branches of knowledge. In the 1880s, students were permitted to select one-third of their junior and senior courses from within a limited range of choices: for instance, seniors chose among French, Italian, and Juvenal. The classics, mathematics, and philosophy continued to dominate their first two years, and the president still taught “keystone” courses to the senior class.8

Shortly after his inaugural in 1868, McCosh brought French and German into the underclass schedule and permitted some choice in the upper-class years at Princeton. Like Hill, he retained much of the older curriculum by restricting most electives to choices among traditional subjects such as Greek, Latin, mathematics, and modern foreign languages. He strengthened the science faculty, adding advanced laboratory work in chemistry and museum work in biology and paleontology. When McCosh retired in 1888, the bachelor of arts curriculum remained a modified form of the traditional practices.9 Thus Princeton and Bucknell ended the 1880s with workable curricular models, while Franklin and Marshall followed similar principles but awkwardly held onto a wholly prescribed curriculum.

There was an impressive breadth of science offerings at the three colleges. It is often forgotten that the classical curriculum was descended from the ancient Greek trivium and quadrivium, which in-

cluded science and mathematics and not merely classical languages and literature. Scientific progress in the early 1800s led most ante-bellum colleges to add mineralogy, geology, zoology, and biology. After Halley's comet appeared in 1844, observatories became common on campuses. Although the government funded work in astronomy, collegiate enthusiasm was so great that most significant research in this period was performed on campuses. After the Civil War, science courses proliferated. For instance, in the early 1870s Franklin and Marshall students studied zoology, botany, inorganic and organic chemistry, physics, acoustics and optics, astronomy, geology, anatomy, and physiology and attended "Lectures on the connection between Natural Science and Revealed Religion." Few students today, other than science majors, spend as much time on science.

Although the three colleges defended the traditional form of the B.A. degree, they created parallel degrees that substituted science and modern languages for some of the Latin and Greek. Colleges had experimented with parallel programs since the 1820s, but only a few scientific and engineering schools (e.g., Lawrence at Harvard, Sheffield at Yale, West Point) consistently awarded degrees other than the B.A. before 1870. In the following decade the colleges unveiled programs that lacked the prestige of the B.A. but provided alternatives for students wishing to substitute other courses for classical languages and literature.

Princeton established the Green School of Science in 1873. Its three-year bachelor of science was dominated by science and mathematics; the curriculum also included English, history, French, and German. For years the school suffered the stigmas of vocationalism and lower standards. Its admission requirements were lower than those for the B.A., and its students were initially barred from the campus literary societies. Extending the program to four years and instituting a graduate electrical engineering program in the 1880s reduced the invidious distinctions.


Bucknell also established a parallel scientific course of study that, like the Green School of Science, began as a weak sister to the B.A. First offered in 1853, the scientific curriculum replaced most of the classics with additional science and mathematics courses. The program languished for decades due to the lack of qualified students and faculty. Finally, a new professor of natural science breathed life into the program, and about 25 percent of Bucknell graduates in the 1880s received Sc.B. or B.L. degrees.¹²

Franklin and Marshall put off parallel curricula until the turn of the century. The delay appears to have been caused by financial limitations rather than hostility toward science. In 1866 a trustee committee recommended creating a parallel scientific course, and the Franklin and Marshall curriculum always included a wide variety of sciences. But providing equipment and faculty was expensive. These colleges may have begrudged the expense, but they were not hostile to science. Even Princeton looked for ten years before finding a wealthy patron to underwrite its science school.¹³

Laurence Veysey once posited that “in nineteenth-century America, educational and theological orthodoxy almost always went together.”¹⁴ If the science courses and parallel curricula at the three colleges modify that generalization, Swarthmore’s experience utterly contradicts it. In harmony with their Hicksite Quaker founders, Swarthmore eschewed classical subjects in favor of scientific and vo-

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¹². Bucknell University, Catalogue, 1869–70 to 1889–90; Oliphant, 149–50; John Winter Rice, A History of the Teaching of Biology at Bucknell University (Lewisburg, Pa., 1952), 1–3. Bucknell awarded its first bachelor of science degree in 1863. Both programs permitted substitution of science courses for some of the classics required for the bachelor of arts. In the 1880s twenty-seven graduates received a Sc.B. or Ph.B., and seventy-seven received a B.A. Bucknell University, Alumni Catalogue, 1851–1921 (Lewisburg, Pa., 1921), 16–25.

¹³. For evidence of the acceptance of science, see Franklin and Marshall College, Catalogue, 1869–70 to 1889–90; H. M. J. Klein, History of Franklin and Marshall College, 1787–1948 (Lancaster, Pa., 1952), 52. See also Professor Stahr’s comments in Franklin and Marshall College, Board of Trustees, Minutes (Franklin and Marshall Archives), 15 June 1886; Varnum L. Collins, Princeton, American College and University Series (New York: Oxford University Press, 1914), 307; Condit, 3–8.

¹⁴. Veysey, 25.
cational offerings. Both presidents in this period favored extensive electives and science programs: President Parrish had been a chemistry lecturer in Philadelphia; and President Magill, who had attended Brown University, was impressed by President Wayland's innovations there. In a promotional pamphlet Parrish explained that the managers intended to feature science and to introduce "no unprofitable subjects of controversy" into the institution; it was "their firm belief that as solid and substantial learning is imparted upon subjects of practical interest, less importance will be attached to visionary ideas and less interest felt in useless speculations." Yet Magill and Parrish both worried that excessive preoccupation with practicality would breed narrowness. In the Friends Intelligencer Parrish warned that "unless we wish to become mere machines of very perfect construction, adapted only to a single end, let this special training be preceded by a generous and liberal culture."

Swarthmore's bachelor of arts program differed radically from those of the other three colleges. The first two years were heavily prescribed, but eliminating Greek and advanced Latin left time for additional work in history, English, German, mathematics, and physics. Two-thirds of the upper-class curriculum was elective; the only requirements were elocution, rhetoric and composition, political economy, French, and history. There was also a senior moral philosophy course that, as at the other colleges, provided an indoctrination in ethics with an emphasis upon the beliefs of the sponsoring denomination. Thus, before Eliot instituted his supposedly revolutionary elective program at Harvard, theologically conservative Swarthmore had already decided that juniors and seniors could select two-thirds of their courses.

Even elementary Latin offended some Quakers; several students in the early years left because they refused to take it. Using the

17. Friends Intelligencer 26 (10 July 1869): 293; Parrish, 88–89; Edward Magill to Edward Parrish, 3 May 1866, Parrish Presidential Papers (Friends Historical Library).
University of Minnesota and Cornell University for precedents, the managers then created a bachelor of letters degree that substituted modern foreign languages for Latin.19

From its inception Swarthmore offered a bachelor of science degree. In the 1870s the freshman and sophomore courses resembled those in the B.A., except that projection drawing and descriptive geometry replaced Latin. Science students did not have to take any of the classical languages, but the ability to read elementary Latin was an admission requirement. The upper-class program stressed physics and chemistry as well as additional work in mathematics and modern foreign languages. Future engineers took the scientific curriculum with additional work in drawing, applied mathematics, and physics; if they worked as engineers for three years after receiving the B.S., they received a civil engineering degree “in course.” Teacher training provided another vocational alternative, which could be taken within a degree program or as a separate two-year certificate course.20 Rhetoric and composition, elocution, political economy, and mental and moral philosophy were the only common upper-class courses for students across the three degree programs.

In the 1880s, President Magill grew increasingly worried about Swarthmore’s academic reputation among other colleges. Its graduates were only admitted to the junior class at Harvard until 1881, when most students were held back a year to raise standards. The conflict over the normal and preparatory departments were two manifestations of the determination on the part of the president and the faculty to bring Swarthmore into line with outside criteria for college work. Eli Lamb, chairman of the managers’ Committee on Instruction, sided with them against more conservative managers committed to preserving a distinctive guarded education. In the late 1880s, the managers agreed to eliminate the normal and secondary programs. Greek was added to the entrance requirements, and admission standards for Latin, mathematics, and natural science were raised. The science and engineering curricula became more distinctive with additional courses in engineering, science, and mathematics as well as

19. A number of letters from parents in the Magill Presidential Papers (Friends Historical Library) complain about the difficulty of the studies, especially languages. See, for instance, S. Bevins to Magill, 1882, box 2.

a new science building and observatory. Swarthmore was gradually adopting a more traditional curricula.

The rapid growth of knowledge potentially threatened the theological and moral bases of Protestant colleges. The label “natural philosophy” for early science courses indicates the antebellum coordination of biblical revelations with science. The moral philosophy course reiterated the compatibility of science and religion. However, Darwinian theory and demands for more specialized science courses threatened this peaceable kingdom after the Civil War.

Most faculty attempted to reestablish harmony by denying that Darwinism, properly understood, clashed with revelation. Professor John Stahr, a Reformed church minister who taught science at Franklin and Marshall from 1871 until his selection as president in 1890, declared that evolution only posed a danger to literal interpretation of scripture. He pointed out that evolutionary theory said little about ultimate origins and did not contradict the view that nature was a rational process. Stahr rejected the view that man was merely an improved gorilla, but he accepted Darwin's *Descent of Man* as a useful explanation of human development as long as it was not used to deny man's spiritual nature. Stahr was confident that thorough work in science posed no danger if approached properly. Skepticism results when “we persistently ignore, or at least forget the only Creator, begin below by induction, adhere only to tangible facts, stifle our deepest intuitions, and believe only what we can see.” But if one had a strong faith and did not try to draw theological conclusions from science, faith would remain intact. Stahr believed it would be illogical for the study of nature to lead one away from its creator.

Stahr's colleague, the Rev. Theodore Appel, also taught science and had a similar faith in its harmony with religion. Pointing out that understanding creation is a matter of faith rather than science, Appel limited science to the safe task of studying how divinely created matter

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21. Homer D. Babbidge, Jr., “Swarthmore College in the Nineteenth Century: A Quaker Experience in Education” (Ph.D. diss., Yale University, 1953), 122–30, 158–83; Enion, 54; Swarthmore College, Committee on Instruction, Minutes (Friends Historical Library), 6 February–15 June 1885; *Phoenix* 6 (February 1887): 99.

assumed its present state. He shared Stahr's view that recent liturgical interpretations eliminated contradictions between religion and science.23

James McCosh maintained a similar position at Princeton. In his inaugural address, he challenged the repudiation of evolution by the leading Old School Presbyterian theologian, Charles Hodge. The president perceived that Darwinism neither dealt with original causation nor necessarily contradicted a general interpretation of Genesis. To McCosh, evolution was the method by which God works. He confidently maintained that "whatsoever is true is also good, and will in the end be favorable to religion."24 Princeton's introductory geology course in the 1870s exemplified McCosh's belief that religion and science could coexist. Eminent geologist Arnold Guyot presented the subject straightforwardly, proceeding from the beginnings of the earth in a ball of gas through the appearance of man. He did not mention religion until the conclusion of the final lecture, when he put geology into a theological context. "Geological history is a grand history of life according to an inward law," he told students. "External laws will give varieties of animals but cannot create a species. The physical globe is merely a means to an end. Man is connected with the upper and invisible sphere, the connecting link between nature and the spirit-world."25

The heralded battle between science and religion was barely a skirmish on these campuses. These colleges would not have hired outspoken skeptics. Similar beliefs were shared by such leading scientists as Harvard's famous biologist, Asa Gray. Responding to


McCosh's request for names of candidates for a science position, Gray noted that “I should much like you to have a good Christian man.”

Once hired, the scientist's freedom was shielded by confidence in the ultimate harmony of science and religion. The judicious scientist could camouflage potentially dangerous discoveries by avoiding the theological implications. Pious educators felt that ignoring modern science was a greater danger. As James McCosh wrote, “I have all along had a sensitive apprehension that the discriminating denunciation of evolution from so many pulpits, periodicals, and seminaries might drive some of our thoughtful young men to infidelity, as they clearly saw development everywhere in nature.”

Swarthmore College was free from such soul-searching about the relation of religion and science. Combining the Quaker faith in the goodness of nature and practical education, the founders had no qualms about scientific studies. President Parrish advertised that the institution “proposed to give greater prominence to the physical, natural, and chemical sciences than is common in ordinary colleges.”

He lauded Herbert Spencer's conclusion that science was the knowledge most worth knowing and proudly emphasized that Quaker educators had long valued science over literature.

Daily teaching of the social sciences and humanities was infused with religion and moral commitment. Since it was more difficult to make as clear a distinction between religion and subject matter, teaching in these areas was more intimately tied to one's worldview. Courses in the social sciences and nonclassical humanities splintered off from moral philosophy. President Hill's teaching at Bucknell illustrates the change. He inherited courses in moral philosophy, metaphysics, Butler's Analogy, constitutional law, and political economy. Hill soon dropped the first three, replacing them with psychology, ethics, and anthropology, and lengthened the political economy course. He also moved from recitations on a textbook to lectures supplemented by readings and discussion. A defender of the economic status quo, Hill taught laissez-faire economics and sought to cleanse students of na-

27. Illick, 236, quoting McCosh's Religious Aspect of Evolution; Perry, 291–95.
28. Parrish, 63–64.
29. Ibid., 10–12.
scent socialist sympathies. Hill’s offerings were a modernized version of the old senior courses, constituting half of the required senior work.30

Humanities and social science courses usually conveyed Victorian moralism. Joseph Dubbs, professor of history at Franklin and Marshall, saw “the true meaning of history as the development of the life of God in the world.”31 A colleague in literature claimed that his field was, next to religion, the most powerful and direct way to form character.32 Another literature professor, the Rev. James Murray of Princeton, emphasized the morality of authors and their works in his lectures. Once he chronicled their sins, Murray could praise the literary value of authors like Byron and Burns and poems like Don Juan. History professor Charles Shields divided the past into four epochs: prehistoric, pre-Christian, Christian (or the “era of progress”), and millennial (or the “era of perfection”). Although he explained secular historical theories, he always returned to his quadrripartite theological breakdown, concluding that the fourth era would usher in a Christian utopia. Professor Lyman Atwater blamed John Stuart Mill’s regrettable radicalism on his “spiritualistic materialism.”33

The board of managers regularly urged the Swarthmore faculty to increase their use of Quaker literature in courses. Typical of most faculty, the head of the philosophy department responded by selecting the textbooks that were “most in harmony with the views of Friends”—but little Friends literature found its way into courses.34 At all four colleges, broadly accepted Protestant norms rather than denominationalism determined the values that were imparted.

Unfortunately, modern curricular debates are too often based on a simplified understanding of late nineteenth-century curricular change.


31. Joseph Henry Dubbs, History of Franklin and Marshall College (Lancaster, Pa.: Franklin and Marshall Alumni Association, 1903), 290. This well-written “house history” exhibits no overt assumptions about divine intervention. As with most of the faculty, such beliefs provided a vague glow rather than a rigid interpretation.


33. Barricklo’s notebooks from courses of professors Murray, Shield, and Atwater.

34. Babbidge, 188–97; Swarthmore, Committee on Instruction, 6 February 1885.
Most surveys of American history and of higher education depict conservative defenders of the classics and the prescribed curriculum engaged in mortal combat with forward-looking proponents of electives, science, and utilitarian education. An eager public presumably withheld their patronage of higher education until the reformers triumphed. The most influential advocate of this view is Frederick Rudolph, who clearly enunciated it in his influential *Curriculum*.

The colleges were plagued by unpopularity and uncertainty of purpose into the 1870s and beyond. A developing rationale, even as the colleges headed unwittingly toward curricular chaos, made its appearance, however, not by some wand’s stroke but because it could no longer be delayed. . . . They [the university builders] confronted the nervousness, the uncertainties, the disjunction between higher education and society in the way that great surgeons meet all but insurmountable medical challenges in movie and television drama. . . .

Until the colleges succeeded in making curricular arrangements that supported that vision of America, they could not be popular or, although unpopular, very effective.  

Rudolph’s book, published by the influential Carnegie Commission, is the resource most generalists draw upon to discuss the nineteenth-century curriculum. These case studies do not support Rudolph’s notion that colleges failed to respond to a palpable demand for university-style reforms. When alternative degrees were offered, most students remained in the bachelor of arts program. The four colleges established graduate programs but found few takers before 1890. Modest growth in the ministry, law, science, engineering, and medicine slowly increased enrollment, but if there was broad public demand for such reforms, it was circumspect.

Instead, as Colin Burke has suggested, these colleges faced greater demand for secondary and normal programs than for utilitarian and graduate programs.  


and only Princeton could have survived solely on collegiate studies. Swarthmore established a normal program, and the other colleges considered adopting teacher training curricula. Swarthmore and Bucknell even sponsored elementary education for a period. These multifunctional institutions served many constituents who were not convinced that a college fit their own or their communities' needs. The denominations increasingly reserved their limited higher education funds for theological seminaries. Thus, college curricula should be judged in the context of a period when the most popular courses were essentially noncollegiate.

Rudolph's implication that colleges were restricted to a choice between a narrowly classical curriculum and that of the new universities caricatures late nineteenth-century higher education. As Stanley Guralnick has pointed out, science had long been a major part of college curricula, and the prescribed programs guaranteed that all students gained considerable exposure to science. Even the rise of Darwinism did not deter the colleges from requiring extensive science courses. As Lewis Perry has observed, rigid opponents of evolutionary theory, such as McCosh's nemesis Charles Hodge, were atypical. The faculty at these colleges complacently absorbed Darwin's work with an optimistic belief that science would not contradict the mysteries of divine creation. These case studies strongly support Lewis Perry's assertion that "probably no subject in the history of American intellectual life has been more widely misunderstood than the reception of Darwin's theory of evolution."

Religious conventions placed greater restrictions on those teaching the burgeoning humanities and social science courses. While scientists could dodge moral questions and had specialized journals, humanistic and social science issues were debated in the general theological and literary journals. Disciplinary organizations in the humanities and social sciences were still in their infancy in 1890, and their journals had not yet fully replaced the denominational quarterlies. Because faculty members at these colleges rarely challenged respectable Victorian political and moral thought openly, the exact boundaries of, and sanctions against, nonconformity are not clear.

These colleges do not fit Rudolph's account of institutions resisting change at every turn until forced to imitate universities. There was

38. Perry, 291–95 (quote is on 292).
resistance to change, and reducing the classics or dropping the prescribed curriculum was a bitter pill. But there was not the desperate resistance described by Rudolph. Indeed, Swarthmore, the college most dedicated to defending its denominational character, eagerly embraced the new curricular ideas. The four colleges added new areas of knowledge as they developed in science, the social sciences, and the humanities. Modern languages, a tradition at Franklin and Marshall, were soon added at the other three. Engineering programs were established at three of the four colleges. This was not revolutionary curricular change, but neither was it stasis. Louise Stevenson’s vision of relatively constant reform, with each generation initially reforming and then defending the new status quo, is a more satisfactory model. Her study of the Yale faculty from 1830 to 1890 and David Hoeveler’s biography of James McCosh show that the two leading “conservative” institutions of traditional historiography earnestly sought to integrate intellectual innovation and evangelical Protestantism. 39

By 1890 the four colleges were converging on a new curricular consensus. Each offered modified B.A. programs with limited electives and parallel programs with reduced classics requirements. Rather than being caught in a dichotomy between obstinately resisting or slavishly following universities, these institutions reached workable reconciliations of their traditional missions and the dramatic expansion of knowledge.