

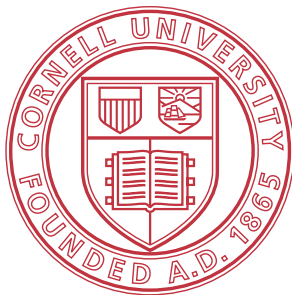
Graduate and Professional Education

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Cornell University

GRADUATE AND PROFESSIONAL EDUCATION

INTRODUCTION

One-third of all individuals pursuing degrees at Cornell University are graduate and professional (post-baccalaureate) students. While Cornell grants four types of baccalaureate degrees (in arts, architecture, fine arts, and science), the university awards twenty-nine different post-baccalaureate degrees, including six doctoral degrees (in law, medicine, musical arts, philosophy, science of law, and veterinary medicine).

The outcomes of graduate and professional education are familiar: the doctor, the lawyer, the teacher, the engineer, the business professional, and a myriad of other experts who perform society's most complex tasks and, due to a combination of training and expertise, are disproportionately represented among the nation's leaders. The processes of graduate and professional education—how students choose among the wide array of programs, how they are selected for admission, how they pay for what are often expensive educational undertakings, how institutions provide financial assistance in a variety of ways (both need- and merit-based), and how students interact with faculty mentors in a highly personalized and somewhat intense academic relationship—are often opaque to the general public.

If undergraduate education is the *raison d'être* of this institution, the breadth and strength of its graduate and professional offerings define Cornell as a research university, serve to attract and retain quality faculty, and help establish the university's relative position in the firmament of higher education. Understanding these programs—their evolution, complexity, diversity, and relative qualities—is essential if one is to comprehend Cornell's true nature.

DEFINING THE RESEARCH UNIVERSITY

In 1890, Andrew Carnegie was elected to Cornell University's Board of Trustees to fill out the term of Judge Amasa Junius Parker, who had died one month prior. Not unlike Ezra Cornell's life experience, Carnegie's was a classic "rags-to-riches" story. As with Cornell a generation earlier, Carnegie was born in poverty, had limited formal education, began working as a teenager, was affiliated with the telegraph business, was a business opportunist with an uncanny insight into the yet



Andrew Carnegie – Cornell University Trustee
1890 to 1919

undeveloped possibilities of emerging technologies, took advantage of being at the right place at the right time, parlayed his hard work and good luck into immense wealth, harbored an abiding dislike of sectarianism, and felt strongly that it was the duty of anyone blessed with wealth to share that good fortune with society. In a June 1889 article he wrote that it was

the duty of the man of Wealth: First, to set an example of modest, unostentatious living, shunning display or extravagance; to provide moderately for the legitimate wants of those dependent upon him; and after doing so to consider all surplus revenues which come to him simply as trust funds, which he is called upon to administer, and strictly bound as a matter of duty to administer in the manner which, in his judgment, is best calculated to produce the most beneficial results for the community.

He also observed, "Of such as these [people who die leaving behind millions of available wealth] the public verdict will then be: 'The man who dies thus rich dies disgraced.'"

Carnegie was born in Scotland to a family of weavers, emigrated to the U.S. in 1848 at age 12, and began work the following year as a bobbin boy in a cotton factory making 20¢ per day. He was then employed successively as a messenger in a telegraph office, as the private secretary of the superintendent of the Pennsylvania Railroad Company, and as the superintendent of that company's Pittsburgh division. He began investing in iron mills and railroad works, and by 1865 he was earning over \$50,000 per year (about \$3 million in current dollars). In that year, he left the railroad to concentrate on a series of management and consolidations that led, in 1889, to the foundation of the Carnegie Steel Company. By 1900, Carnegie's annual profits from this corporation totaled \$25 million (about \$1.6 billion in current dollars), and the sale of Carnegie Steel to J. Pierpont Morgan's newly formed United States Steel Corporation in 1901 made Carnegie (according to Morgan) "the richest man in the world." Matthew Josephson described the deal:

The great anxiety for him [Carnegie] was now whether he would ask enough. After putting their heads together for a long time, Carnegie and Schwab scribbled a sum upon a piece of paper: in bonds and stock the price on the Carnegie Steel Company was placed at \$492,000,000! In accepting, with a brusque decision, this stupendous ransom, of which Carnegie was to receive over \$300,000,000 in bonds and preferred stock, Morgan did not see Carnegie. ...They met again a year or two afterward, on...an ocean steamship. Carnegie said: "I made one mistake, Pierpont, when I sold out to you. I should have asked you \$100,000,000 more than I did." And Morgan, red-faced, glowering, said: "If you had, I should have paid it to you," adding, according to the legend, "—if only to be rid of you."

The selling price represented about \$32 billion in current dollars, and Carnegie's share was about \$19.5 billion. As Carnegie retold in his autobiography,

After my book, "The Gospel of Wealth," was published, it was inevitable that I should live up to its teachings by ceasing to struggle for more wealth. I resolved to stop accumulating and begin the infinitely more serious and difficult task of wise distribution.

He did so by creating a world-wide series of charities, giving away \$350,695,653 throughout his lifetime (about \$22 billion in current dollars), according to the *Literary Digest*. Through a curious chain of events that began with a social affair and involved Cornell University, Carnegie's largess exerted a profound impact on higher education in North America, in a manner and to a degree that even he could not have foreseen.

Carnegie's Handprint and Legacy

Carnegie met Cornell University's first president, Andrew D. White, at a dinner party. Carnegie described White as a "lifelong friend and wise counselor," and it was through White that Carnegie was introduced to the university. At his first meeting in Ithaca, New York with fellow trustees in October 1890, Carnegie was initiated into the economic fundamentals of higher education as raises for several faculty members were discussed and approved. As Carnegie later recounted:

Of all professions, that of teaching is probably the most unfairly, yes, most meanly paid, though it should rank with the highest. Educated men, devoting their lives to teaching the young, receive mere pittance. When I first took my seat as a trustee of Cornell University, I was shocked to find how small were the salaries of the professors, as a rule ranking below the salaries of some of our clerks.



The plight of faculty at the time, including those at Cornell, was genuine. At Cornell, faculty—even prominent professors and department heads—were being paid at levels in 1890 that were not substantially different from those of 25 years earlier. Carnegie further observed, "To save for old age with these men is impossible. Hence the universities without pension funds are compelled to retain men who are no longer able, should no longer be required, to perform their duties."

To address the lack of adequate retirement provision for faculty, Carnegie created the \$10 million Carnegie Teachers Pension Fund in 1905 and selected as its trustees 25 presidents from prominent colleges and universities, including the heads of Harvard, Yale, Columbia, Princeton, Stanford, Cornell, and the University of Pennsylvania. As described by Joseph F. Wall, Carnegie decided "to provide retiring pensions for the teachers of Universities, Colleges and Technical Schools in our country, Canada and Newfoundland, under such conditions as you [the trustees] may adopt from time to time." Carnegie placed several restrictions on the trustees in awarding these free pensions, limitations that constituted the next link in the chain.

The fund could not discriminate on the basis of race, sex, creed, or color and would exclude public and sectarian institutions. According to Wall:

Had Carnegie simply set up a pension fund for all college teachers in private colleges and universities, as the original title of the Fund implied...the trustees would have had little to do but see that there was a proper administration of the pensions. It was Carnegie's strong bias against sectarianism, plus the phrase "under such conditions as you may adopt," that enabled probably the ablest group of college administrators that could have been selected at that time to set standards for higher education. Setting such standards had never before been done on a national basis, and it was to have consequences reaching far beyond Carnegie's...original intentions. ...The first act of the trustees was to send out a questionnaire to 627 institutions of higher education throughout the United States and Canada, asking each college the size of its endowment, what educational standards it had established for admission and for graduation, what its relation to the state or province was, and what, if any, sectarian ties or obligations it had.

The trustees received 421 applications, which they winnowed to 52 for admission (including Cornell). Among those rejected were Brown, Northwestern, and Vanderbilt on sectarian grounds and the University of Virginia due to weak admissions standards.

In...schools...not so fortunate as to be selected, the anguished cries of faculty members and the threats of resignation shook college administrations with a violence that Carnegie...could hardly have imagined. There were emergency sessions of boards of trustees throughout the country, and charters that had once been considered inviolate were in many places quickly changed to remove sectarian requirements. ...Inadvertently, Carnegie, with his pension plan, had done more in a year to advance the standards of higher education within the United States than probably any carefully conceived program to accomplish that goal could ever have done.

Eventually, so many public institutions clamored to be admitted to this exalted fraternity that Carnegie "allocated an additional \$5 million to provide funds for pensions in state universities." Sectarian institutions also clamored but found little relief in Carnegie, who, in responding to the President of Northwestern, noted, "So many colleges have seen fit to broaden their views and become participants in the Pension Fund that it is best to adhere to present conditions, hoping the reform may soon be complete."

The evolution of the Carnegie Teachers Pension Fund deserves its own postscript. Originally chartered in New York State, it received a national charter in 1906

as The Carnegie Foundation for the Advancement of Teaching. Because a free pension system could not be sustained, a separate, independent legal reserve life insurance company—the Teachers Insurance and Annuity Association of America (TIAA)—was chartered in New York State in 1918 with the Carnegie Corporation providing the initial capitalization and owning its stock until 1938, when total control was turned over to TIAA's trustees. As of September 2005, TIAA and its 1952 partner, the College Retirement Equities Fund, had combined assets under management of \$360 billion, serving 3.2 million people at over 15,000 educational, research, and health care institutions.

While the generative impulse had been faculty pensions, the Foundation's foray into institutional assessment took on a life of its own. As Wall noted:

By 1909, it was quite apparent to anyone interested in higher education that the Carnegie Foundation had become the national unofficial accrediting agency for colleges and universities. Good teachers were accepting positions on the basis of whether or not the school was a participant in the pension fund, prospective donors used participation as a major criterion in determining the status of the institution, and it even had an indirect effect upon admissions. ...Increasingly, with Carnegie's approval, more and more revenue was being used by the Foundation to broaden its investigations of higher education in the United States, to publish critiques, and to suggest standards.

In its centenary celebration in 2006, the Foundation noted six primary accomplishments:

- Influential policy reports addressing quality, access, and assessment.
- The development of the Teachers Insurance and Annuity Association (TIAA).
- Publication of The Flexner Report, which dramatically changed medical education.
- Creation of the Carnegie Unit.
- Founding of the Educational Testing Service.
- Establishment of one of the leading research tools for educational researchers, the Carnegie Classification of Institutions of Higher Education.

The issuance of the Flexner Report in 1910 (and similar analyses of engineering and legal education) and the creation of the Carnegie classification system became the two final links in the chain of events that helped define the modern research university. The former stimulated change through public embarrassment and the latter created an unintentional pecking order that remains as potent today as the annual rankings by *U.S. News and World Report* and other publications.

The Carnegie Classification System

The Carnegie Commission on Higher Education created an internal classification system for higher education in 1970. The system went public in 1973, and has been updated periodically. Today, it is widely used by governments, accrediting agencies, rankings organizations, popular media, and researchers to compare and contrast the 4,000-plus U.S. institutions that are degree-granting and are accredited by an agency recognized by the U.S. Secretary of Education. The classification system was overhauled in 2005, and a more complex schema has just been released. Until this recent revision, colleges and universities were classified primarily on the size and diversity of their research programs and the nature and variety of graduate and professional degrees awarded. Two primary considerations drove the recent change:

- The old classification system failed to sufficiently recognize the importance of undergraduate education and the variations that occur in delivering these programs that may be somewhat unrelated to graduate and professional education.
- The old classification system encouraged a “join-the-club” mentality among institutions wishing to advance in rank and prestige. Witness Arizona State University’s commentary on research universities as part of its recently unveiled strategic plan to transform that institution vis-à-vis its peers:

Research universities have been responsible for educating successive generations of scientists, engineers, artists, healthcare professionals, educators, and our nation’s leaders in government and industry. Universities, to an astonishing degree, advance the health and happiness of humankind. Fifteen institutions—from Harvard to Michigan to Stanford—define the American research university. Such has been the influence of these institutions that, to this day, every university in the nation measures itself according to their standards. These universities are considered definitive prototypes, and their disciplinary departments are the departments by which all others are implicitly judged.

The new Carnegie Classification System uses five vectors to categorize higher education:

- *Undergraduate Instructional Program* – which assesses the level of undergraduate degrees awarded...the proportion of bachelor’s degree majors in the arts and sciences and in professional fields, and the extent to which an institution awards graduate degrees in the same fields in which it awards undergraduate degrees.

Cornell’s profile in this category is *balanced arts*

and sciences/professions, high graduate coexistence, which it shares with 93 other institutions, including research university peers.

- *Graduate Instructional Program* – which is based on the level of graduate degrees awarded (master’s/professional or doctoral), the number of fields represented by the degrees awarded, and the mix or concentration of degrees by broad disciplinary domain.

Cornell’s profile in this category is *comprehensive doctoral with medical/veterinary*. There are 77 institutions that match Cornell by this criterion, including most research university peers.

- *Enrollment Profile* – which groups institutions according to the mix of students enrolled at the undergraduate and graduate/professional levels, ...[providing] a bird’s eye view of the student population.

For this category Cornell is defined as *majority undergraduate*, a condition replicated at 300 other institutions.

- *Undergraduate Profile* – a new classification which describes the undergraduate population with respect to three characteristics: the proportion who attend part- or full-time; achievement characteristics of first-year students; and the proportion of entering students who transfer in from another institution.

Cornell is characterized as: *full-time four year, more selective, lower transfer-in*, in this classification parameter, a categorization that it shares with 275 other institutions.

- *Size and Setting* – another new classification which describes institutions’ size and residential character. Because residential character applies to the undergraduate student body, exclusively graduate/professional institutions are not included.

Cornell’s is listed as *large four-year, primarily residential*, a category it shares with 88 institutions, including several research universities.

Of the 4,383 U.S. degree-granting institutions, Cornell is the only private institution that has this particular profile. (Two public institutions also match: the Universities of Illinois and South Carolina.) It is Cornell’s combination of a broad and diverse assemblage of doctoral and professional offerings, a balanced set of arts and sciences and professional studies at the undergraduate level, and the high correlation between these undergraduate and graduate/professional fields that allows Cornell (as articulated in 1998 by its tenth president, Hunter R. Rawlings) to aspire to be “the best research university for undergraduate education.”

THE EMERGENCE OF ADVANCED STUDIES

A common but incorrect view of higher education is that the emergence of advanced studies—graduate and professional education beyond the baccalaureate—is an embellishment to a basic college education. This misconception is understandable as the chronological development of these programs in America follows that ontogeny. Most U.S. colleges founded prior to the Civil War offered no advanced studies, and the few that did granted degrees at the master’s level. In America, the deployment of the doctorate was inextricably entwined with the evolution of the research university. Both phenomena began in the period around the Civil War, an era of social, economic, and political upheaval that saw the United States transform itself from a provincial, agrarian society to an industrial world power. While a relatively new phenomenon in America, the advanced degree has a much older pedigree. As explained in the *Encyclopædia Britannica*,

The hierarchy of degrees dates back to the universities of 13th-century Europe, which had faculties organized into guilds. Members of the faculties were licensed to teach, and degrees were in effect the professional certifications that they had attained the guild status of a “master.” There was originally only one degree in European higher education, that of master or doctor. The baccalaureate, or bachelor’s degree, was originally simply a stage toward mastership and was awarded to a candidate who had studied the prescribed texts...and had successfully passed examinations held by his masters. The holder of the bachelor’s degree had thus completed the first stage of academic life and was enabled to proceed with a course of study for the degree of master or doctor. After completing those studies, he was examined by the chancellor’s board and by the faculty and, if successful, received a master’s or doctor’s degree, which admitted him into the teachers’ guild and was a certificate of fitness to teach at any university.

The terms master, doctor, and professor were all equivalent. ...At the University of Paris, however, the term “master” was more commonly used, and the English universities...adopted the Parisian system. ...In German universities, the titles master and doctor were also at first interchangeable, but the term doctor soon came to be applied to advanced degrees in all faculties, and the German usage was eventually adopted [worldwide].

Thus the bachelor’s degree (the baccalaureate*) was, in the beginning, never intended to be a terminal degree. It was instead a stepping-stone to an advanced degree that was designed to prepare and certify future fac-

ulty (both lay and clerical) who would teach primarily in institutions of higher education or serve in the church. European universities also granted the licentiate degree, which was a license to practice a specific profession (such as a legal career in government).

A Variety of Educational Paths

American scholars completed their educations in a variety of ways in the nineteenth century, sometimes traveling to Europe to attend one of the universities that offered doctoral programs. Although a bachelor’s degree might be earned along the way, the accepted path to most professions other than teaching or the ministry (those of the physician, lawyer, architect, or engineer) was through apprenticeship to a current practitioner rather than advanced study. Often, the combination of formal education and a period of apprenticeship created a unique path to be followed, and examples of these educational perambulations can be seen in the lives of several Americans of the period.

- *Martha Carey Thomas* – educator, feminist, college president (Bryn Mawr), and university trustee (Cornell). Thomas began her education in a local Quaker dame’s school in Baltimore, Maryland that was thought appropriate for “young ladies;” attended the Howland School, a Quaker academy for girls in Union Springs, New York; moved on to Cornell University and obtained her bachelor’s degree in 1877; was admitted to Johns Hopkins as the first woman in that institution to pursue a master’s degree (withdrawing after a year because she was not permitted to attend lectures or study Greek); enrolled in the University of Leipzig to pursue a doctorate (because the University allowed women to hear lectures) but withdrew because that institution refused to award a Ph.D. to a

* The *bachelor* portion of *baccalaureate* is believed to derive etymologically from *bas chevalier* (literally, below a knight), as a bachelor was a “...young knight, not old enough, or having too few vassals, to display his own banner, and who therefore followed the banner of another, [basically] a novice in arms.” [Oxford English Dictionary] This meaning was then adapted by trade guilds to designate assistants who were in training and, eventually, individuals who were studying for their first, entry level university degree. It was in this latter sense that Geoffrey Chaucer described in the Franklin’s Tale of *The Canterbury Tales* the encounter of Aurelius’s brother with a “bachelor of lawe” while studying at the University of Orléans.

GRADUATE AND PROFESSIONAL EDUCATION

woman and forced her to sit behind a screen during classes so as not to “distract” male students; and finally secured her Ph.D. from the University of Zurich, where she became the first woman to graduate (and she did so *summa cum laude*).

- *Abraham Lincoln* – mill hand, merchant, postmaster, surveyor, lawyer, legislator, and U.S. President. Lincoln’s formal education was very rudimentary, and he came to the practice of law in a manner typical of most country lawyers in the 1830’s. As Carl Sandburg related it, Lincoln was operating a small general store in New Salem, Illinois when

A mover came by, heading west in a covered wagon. He sold Lincoln a barrel. Lincoln afterward explained, “I did not want to, but to oblige him I bought it, and paid him half a dollar for it.” Later, emptying rubbish out of the barrel, he found books at the bottom, Blackstone’s “Commentaries on the Laws of England.” By accident, by a streak of luck, he was owner of one famous book that young men studying law had to read first of all.... So he read Blackstone...on the flat of his back on the grocery-store counter, or under the shade of a tree with his feet up the side of the tree. One morning he sat bare-foot on a woodpile, with a book. “What are you reading?” asked Squire Godby. “I ain’t reading; I’m studying.” “Studying what?” “Law.” “Good God Almighty!”

While studying his law books and reading anything else he could find, Lincoln taught himself to be a surveyor and ran for the Illinois State Legislature. James McPherson noted that Lincoln eventually won a seat in 1834, and while there,

Lincoln came under the wing of John T. Stuart, a Springfield lawyer and Whig minority leader in the house. Stuart encouraged Lincoln to study law and guided him through Sir William Blackstone’s *Commentaries on the Laws of England* (1765-1769) and other books whose mastery was necessary to pass the bar examination in those days. On 9 September 1836 Lincoln obtained his license. In 1837 he moved to Springfield and became Stuart’s partner.

According to the *Encyclopædia Britannica*:

Within a few years of his relocation to Springfield, Lincoln

was earning \$1,200 to \$1,500 annually, at a time when the governor of the state received a salary of \$1,200 and circuit judges only \$750. He had to work hard. To keep himself busy, he found it necessary not only to practice in the capital but also to follow the court as it made the rounds of its circuit. Each spring and fall he would set out by horseback or buggy to travel hundreds of miles over the thinly settled prairie, from one little county seat to another. Most of the cases were petty and the fees small.

By the time he began to be prominent in national politics, about 20 years after launching his legal career, Lincoln had made himself one of the most distinguished and successful lawyers in Illinois. He was noted not only for his shrewdness and practical common sense, which enabled him always to see to the heart of any legal case, but also for his invariable fairness and utter honesty.

- *Samuel David Gross* – surgeon, professor (University of Louisville, Jefferson Medical College), author, and subject of Thomas Eakins’s famous painting, “The Gross Clinic” (1875). Gross was born near Easton, Pennsylvania in 1805, and as he described,

I had had from my earliest childhood the strongest desire to be a “doctor.” ...At the age of seventeen I considered myself competent to commence the study of medicine, and I accordingly entered the office of a country physician; but he afforded me no aid, and I therefore soon quit him and tried another, with no better luck. They had none but old, if not obsolete, books; they were constantly from home, never examined me, or gave me any encouragement.

According to biographer Francesco Cordasco,

Aware of his educational deficiencies, Gross stopped his medical apprenticeship to continue his general education, first in [the] Wilkes-Barre [Academy in Pennsylvania] and later at the Academy of Lawrenceville, New Jersey. He resumed his medical studies with Swift in 1824. In 1826 Gross was headed for study at the University of Pennsylvania

but instead, on the strength of his reputation, enrolled as a private pupil with Dr. George McClellan (father of the Civil War general). Gross matriculated at Jefferson Medical College in Philadelphia, which McClellan had founded in 1825. ...Gross received his medical degree in 1828, with a thesis on “The Nature and Treatment of Cataract.”



Martha Carey Thomas – Bryn Mawr College President – 1894 to 1922

Even as a graduate of a reputable school, Gross admitted that his medical education consisted of two courses of lectures taken over 18 months. These, he noted, “however able or erudite, are only aids. They never can make a good physician or a great man out of a dunce.” His final exam to qualify for an M.D. degree lasted 35 minutes.

- *Andrew D. White* – educator, state legislator, university president (Cornell), and U.S. minister (Germany and Russia). White was born in 1832 in Homer, New York, to a family of merchant bankers, who enjoyed relative wealth and cherished education. His family moved to Syracuse, New York in 1839, and he attended the Syracuse Academy. In 1849, his parents sent him to Geneva (later Hobart) College, a small Episcopalian institution, where his experience was generally disagreeable:

The college was at its lowest ebb; of discipline there was none; there were about forty students, the majority of them, sons of wealthy churchmen, showing no inclination to work and much tendency to dissipation. The authorities of the college could not afford to expel or even offend a student, for its endowment was so small that it must have all the instruction fees possible, and must keep on good terms with the wealthy fathers of its scapegrace students. The scapegraces soon found this out, and the result was a little pandemonium.

With much effort White convinced his father to send him to Yale in his sophomore year, and even that path was not straightforward. On the train to New Haven, his father proposed that they stop in Hartford to take a look at Trinity College, bribing him with an offer for “the best private library in the United States” if he would attend Trinity. Andrew as adamant, “No, I am going to New Haven; I started for New Haven, and I will go there.” White was initially disappointed in Yale as the lower classes of instruction were

given almost entirely by tutors, who took up teaching for bread-winning while going through the divinity school. Naturally most of the work done under these was perfunctory. There was too much reciting by rote and too little real intercourse between teacher and taught.

Matters did not improve much in his junior and senior years, and White observed, “Very important in shaping my intellectual development at this time were my fellow-students,” including Daniel Coit Gilman, rather than the formal instruction he received. He earned his bachelor’s degree from Yale in 1853, and then traveled abroad for almost



Andrew D. White – Cornell University President
1866 to 1885

three years (part of the time with Gilman), visiting Oxford and Cambridge in England and studying at the Sorbonne and Collège de France in Paris. In 1855, he matriculated at the University of Berlin, attending lectures and studying literature. As Morris Bishop described:

He found in Germany a kind of culture unknown in Syracuse, Geneva, and New Haven. It was composed of intellectual vigor directing material advance, of profound respect for abstract thought and thinkers, of broad freedom of speculation, of state generosity toward universities, professors, musicians, artists.

White returned to America in 1856, “probably one of the hundred best-educated men in the country” according to Bishop, to undertake a degree at Yale. In returning from Europe he had considered a number of career choices: the ministry, authorship, gentleman farming, law, politics, journalism, or architecture. As Bishop related,

He ended by spending a year in New Haven, reading, arranging his already remarkable library, writing magazine articles, and taking an M.A. in the offhand way of the time.

THE TRANSFORMATION

The “offhand way of the time” in which Andrew D. White took his M.A. degree in 1857 was not atypical. According to Everett Walters,

in these early years many college graduates received a Master of Arts degree, usually in recognition of their good behavior for three years and a five-dollar fee. Ironically, these master’s degrees were conferred “in course.”

Basically, one presented one’s credentials, which might include lectures attended, studies undertaken, and papers written at any and all institutions. The applicant might or might not be subjected to an oral examination by the faculty. Sometimes, the degree was awarded to someone who had simply continued studying at the college for an additional year after receiving a bachelor’s degree.

While the English form of higher education had been imported to colonial America, the colleges that were founded up through the end of the eighteenth century were mostly small, religiously affiliated institutions that lacked the intellectual ferment that was sweeping Europe in the early nineteenth century, especially in France and Germany. It was that excitement that drew American scholars such as Carey Thomas and Andrew White. Charles Thwing observed, “In the year 1872 there were less than two hundred graduate students in American universities and colleges.” Yet German universities had, for several decades prior, attracted Americans in equal or greater numbers. (Everett Walters noted that by 1850 the number was almost 200, rising to 1,000 in the 1860’s and a peak of 2,000 by the 1880’s.)

The transformation of American higher education to embrace advanced studies in a European sense occurred in the middle of the nineteenth century due to the efforts of several innovative educators. It involved four major changes:

- The introduction of the doctoral degree, especially the Ph.D., and a concomitant strengthening of requirements for advanced degrees.
- An educational revolution that expanded the range of what could be taught and studied beyond traditional classical and ecclesiastical curriculum that had dominated higher education until then combined with a pronounced movement away from orthodoxy and towards “free thought.”

- The creation of graduate (and later professional) schools that served to formalize and differentiate these studies from the undergraduate experience.
- The stimulation for curricular change wrought by the Morrill Land Grant Act of 1862 and for research through the Hatch Act of 1887, both of which primed the pump for federal government support for education.

The Doctoral Degree

As Everett Walters has described:

Of the several American colleges, not yet universities, that offered graduate work during the first half of the nineteenth century, Yale was the first to establish work leading to the doctorate and also the first to award the degree Doctor of Philosophy. [In 1860] the Yale Corporation authorized...the degree Doctor of Philosophy so as “to retain in this country many young men, and especially students of Science who now resort to German Universities for advantages of study no greater than we are able to afford.” ...In 1861 Ph.D.’s were awarded to three students who had already been studying in the department.

Among those Scientific School professors at Yale who led this charge was Daniel Coit Gilman, who in 1856

had produced a pamphlet about doctoral education that Walters termed “the blueprint for graduate programs in the United States.”



Based on Yale’s impetus and success, other institutions implemented doctoral programs. Harvard announced in 1872 that its faculty was prepared to offer formal graduate work for which the degrees Master of Arts, Doctor of Philosophy, and Doctor of Science would be offered.

At Cornell University, Gilman’s friend, Andrew D. White, had crafted a design for a new university that would be an “asylum for Science, where truth shall be sought for truth’s sake,” and where graduate work would be one of its major concerns from inception. Cornell’s first register, published in 1869, described the degrees available, including three bachelors’, a licentiate for students who pursued the Special Course, and four graduate degrees:

1. The degree of MASTER OF SCIENCE, or an equivalent degree, is conferred upon such Bachelors of Science as may exhibit proof, satisfactory to the Faculty, of proficiency in general science or in any special science.

2. The degree of DOCTOR OF PHILOSOPHY is conferred:—1. Upon such Bachelors of Science as may give proof, satisfactory to the Faculty, of literary or general proficiency; 2. Upon such Bachelors of Arts, of Philosophy or of Science as have completed a meritorious original investigation in Chemistry.

3. The degree of MASTER OF ARTS, is conferred upon such Bachelors of Arts as may give proof, satisfactory to the Faculty, of literary proficiency.

4. The degree of CIVIL ENGINEER is conferred upon such Bachelors of Science as, after six Trimesters, or two years, of additional study, have passed the requisite examinations in the School of Engineering.

The university conferred its first graduate degree to Henry Turner Eddy,* who was actually employed as a Cornell faculty member at the time (as an assistant professor of mathematics). Eddy received the degree of Civil Engineer in 1870, and two years later was awarded a Doctor of Philosophy. The first full-time student to receive an advanced degree from Cornell was David Starr Jordan, the future president of Stanford University, who was awarded a Master of Science degree in that same year (1872).



Gilman went on to help found Johns Hopkins University in 1876, serving as its first president and championing the concept that scholars could advance their own areas of research and benefit society at large. As Walters described, under the presidency of Gilman

the university declared graduate and advanced education as its most important mission. ...The influence of the German university tradition was strong, for Gilman and almost all of his faculty had studied at German uni-

versities; thirteen of them had the German doctorate. Johns Hopkins' avowed purpose, Gilman stated in his inaugural address, was "the most liberal promotion of all useful knowledge; ...the encouragement of research; the promotion of young men; and the advancement of individual scholars, who by their excellence will advance the sciences they pursue, and the society where they dwell." ...Gilman believed from the beginning that the university would be a training place for professors and teachers for the highest academic posts, and that the university must house great libraries, laboratories, and museums. He also believed that, to transmit the fruits of research, the university must sponsor scholarly and scientific journals and operate a university press.

According to Johns Hopkins University, Gilman

dismissed the notion that teaching and research are separate endeavors; he believed that success in one depended on success in the other. "The best teachers are usually those who are free, competent and willing to make original researches in the library and the laboratory," Gilman said. "The best investigators are usually those who have also the responsibilities of instruction, gaining thus the incitement of colleagues, the encouragement of pupils, the observation of the public."

In less than 20 years the concept of graduate education and the doctoral degree had swept across the U.S. higher education landscape.

Curricular Revolution

Besides the pattern of Americans flocking to German universities in the nineteenth century, there was an opposite flow of European-trained German scholars who migrated to America to teach. As Walters noted "they brought with them the philosophies, method, and, above all, the spirit of the German university tradition." They included Francis Lieber, a political scientist and historian; Hermann von Holst, also a historian who focused on the American Constitution; and the Nobel Prize winning physicist, Albert A. Michelson. What American scholars discovered in Germany and what German scholars brought to the United States was, as Walters explained, an emphasis on

freedom of teaching and learning. Here was a principle that was captivating: it meant that teacher and student were seekers after the truth without regard for the consequences, whatever they might be. ...Thus, a subject would be pursued without concern for current public opinion, religious strictures, political restrictions, historical traditions, or established concepts. How compelling for young Americans were the words of the German philosopher Fichte: "I am a priest of the truth; I am in her service..."

* Morris Bishop called Henry Turner Eddy "a glutton for degrees." Besides the two earned at Cornell, Eddy received a Bachelor of Arts from Yale (1867) and a Bachelor of Philosophy from Yale (1868). He studied at the University of Berlin and the Sorbonne and the Collège de France in Paris during 1879-80, was awarded the LL.D. from Centre College in Kentucky in 1892, and received an honorary Doctor of Science degree from Yale in 1912.

GRADUATE AND PROFESSIONAL EDUCATION

Also imported from Germany were two pedagogic styles and an emphasis on the need for academic support structures. The styles included

- the *lecture*, designed as a series of logically connected presentations that would expose the subject in its complete context, including its relationship to the entirety of human knowledge, and
- the *seminar*, or “seminary,” as it was known, which was “a training method for independent investigation of a significant problem.” Seminars were called the “nurseries of research.”

The support structures were the library, the museum, and the laboratory—all three familiar and fundamental to modern education and virtually absent from most American colleges prior to the Civil War.

The German tidal wave of the 1860’s and 1870’s met a corresponding wave that was unleashed by the Morrill Land Grant Act of 1862—with its emphasis on the “practical arts”—creating the perfect curricular storm that was nowhere more evident than in the founding of Cornell University in 1865. Set in rural upstate New York, this institution was designed to commingle the classical studies that had been featured in American colleges since Harvard’s founding in 1636, new German curriculum (with its emphasis on modern languages, history, and literature; art; and science), and various technical areas that hitherto had not been included generally in American higher education.

As Frederick Rudolph noted,

Cornell brought together in creative combination a number of dynamic ideas under circumstances that turned out to be incredibly productive. ...Andrew D. White, its first president, and Ezra Cornell, who gave it his name, turned out to be the developers of the first American university and therefore the agents of revolutionary curricular reform. ...the United States has been so coastal in its definition of what has happened that even now in Cambridge and Baltimore, New York and Philadelphia, the suggestion that Ithaca, New York, is where the American university was first successfully defined still comes as news.

White envisioned that these subjects would be offered on equal footing, without any perceived hierarchy among the faculty who taught and the students who learned. The institution was originally organized around nine special colleges* or faculties:

- *Agriculture*, which offered studies in seven areas: the chemistry of agriculture, the geology of agriculture, the physics of agriculture, the mechanics of

agriculture, the botany of agriculture, the zoology of agriculture, and the economics of agriculture;

- *Chemistry and Physics*, which included a School of Chemistry and a School of Physics and Experimental Mechanics;
- *History and Political Science*, which offered studies spanning ancient to modern periods and included a School of Political Science;
- *Languages*, which included a School of Ancient Languages and a School of Modern Languages;
- *Literature and Philosophy*, which included a School of Literature and a School of Philosophy;
- *Mathematics and Engineering*, which included Schools of Mathematics and Civil Engineering;
- *Mechanic Arts*, which offered instruction in the science and general practice of the discipline;
- *Military Science*, which offered instruction in military tactics (and was made obligatory for all able-bodied students); and
- *Natural Science*, which included a School of Botany, a School of Geology, a School of Zoology, and a School of Physical Geography.

Over the ensuing decades, Cornell added colleges in other technical areas—including architecture, business, education, forestry, human ecology, hotel administration, industrial and labor relations, law, medicine, nursing, pharmacy, and veterinary medicine—and entertained schools of mining and journalism.

Graduate and Professional Schools

With the introduction of the Ph.D. degree in America during the middle of the nineteenth century came the concept of a graduate school. However, unlike the professional schools that eventually coalesced around the teaching of the more technical disciplines—such

* When Cornell was founded, a *college* (also referred to as a *faculty*) was a collection of professors and instructors organized around the teaching of a discipline. This was somewhat separate from a *department*, which was an administrative unit that faculty were associated with for academic support. Depending on disciplinary expertise, a professor could be a member of more than one college simultaneously but would have been housed “administratively” in only one department. This connotation persists today as there is a general faculty, a graduate faculty, and separate faculties for each of the colleges. A given professor may be a member of one or more of these faculties.

as architecture, law, and medicine—graduate schools remained somewhat amorphous. As Walters noted,

With an exception or two, there was no separate graduate school with its own faculty, buildings, and budget. Rather graduate work was added to undergraduate instruction, with common faculty and facilities. The graduate school, as such, did not exist. The problems of administration were handled by an organization known as the “graduate school” or an administrative committee (or board), with a dean to deal with problems of degree requirements, fellowships, and similar matters. ...Faculty appointments, course offerings, and facilities were the responsibility of the undergraduate dean and the department chairmen.

For example, Yale’s graduate school, originally called the Department of Philosophy and the Arts, was established in 1847, although no graduate degrees were awarded until 1861. It was renamed the Graduate School of Arts and Sciences in 1892. Harvard created its Graduate Department in 1872, renaming it the Graduate School in 1890 and the Graduate School of Arts and Sciences in 1905 to distinguish it more clearly from the professional schools at Harvard.

Originally, professional programs, even those in law and medicine, were not considered advanced studies. Instead, they awarded baccalaureate degrees. Only gradually, in the twentieth century, were entrance requirements for professional programs elevated sufficiently (by requiring a bachelor’s degree for admission) that some of these programs became advanced studies. At Cornell, those disciplines that offered advanced degrees only (law, management, medicine, and veterinary medicine) eventually evolved into “professional schools” while those disciplines that continue to offer a bachelor’s degree did not (and are sometimes referred to as “undergraduate colleges”). In reality, all of Cornell’s schools and colleges currently offer graduate studies in addition to some mixture of undergraduate and/or professional degree programs, so the typology is less than useful in differentiating their relative strengths in supporting advanced studies.

Federal Support for Higher Education

The Morrill Land Grant Act of 1862 had two profound effects on U.S. colleges and universities:

- The Act helped broaden higher education’s disciplinary focus to include technical and professional subjects that had been absent previously.

- The Act established a role for the federal government in higher education by offering a carrot—federal funding—to those states that would embrace this new focus by establishing new entities or expanding current institutions to undertake a new educational mission.

The 1862 Act neither provided for or precluded advanced studies programs. But by emphasizing the study of agriculture and engineering in a university setting, the Act stimulated the scientific examination of these activities and thereby called for a new cadre of faculty trained in these disciplines. The Hatch Act of 1887 and the Smith-Lever Act of 1914 unleashed a flow of federal funding for research and extension in agriculture, which was also dependent on the social and scientific developments that emerged from the faculty and graduate students of the nation’s colleges and universities, especially the land-grant institutions. These programs established a precedent of federal involvement in university research that blossomed during and after World War II. As Oliver Carmichael, the former president of The Carnegie Foundation for the Advancement of Teaching, observed in 1961,

Though less than one hundred years old as an organized university activity, graduate education and research have in that period probably influenced the life of society more than any other one division of the university, because they have stimulated the professional schools, government, business, and industry to emphasize research as a means of progress. The spirit of inquiry, investigation, and discovery, which was responsible for the new industrial revolution of the mid-nineteenth century, antedated the development of graduate and research work, but the crystallization of this spirit into an institution, the graduate school, consciously devoted to fostering research as one of its chief purposes, was the contribution that higher education made to the revolutionary movement.

Morris Bishop concurred, especially in terms of the impact of the Hatch Act:

John De Witt Warner, in his alumni trustee’s report for 1899, alleged that ours was the only department [of agriculture] in the country that offered serious graduate courses and that as a result we had many more graduate students than our rivals. As the graduate work in Agriculture was linked with the investigation in our Experiment Station, all graduate work was bound up with faculty research. The very idea, the concept, of research as a university function had become axiomatic. Only a half century had passed since President Tappan of Michigan had proclaimed to his incredulous Regents that a university should advance knowledge, not merely preserve it.

GRADUATE AND PROFESSIONAL EDUCATION

As an aside, Bishop noted that in 1898 the U.S. Deep Waterways Commission provided a grant to study the flow of water over weirs at Cornell's newly constructed Hydraulic Laboratory, an event that was "...the first case in our history of government-sponsored research in engineering," and may have been the first case in U.S. higher education. Today, the federal government provides approximately \$450 million to Cornell annually in the form of grants and contracts, largely focused on research, and an additional \$16 million in federal appropriations for research and extension.

ADVANCED EDUCATION AT CORNELL

As noted earlier, while graduate education was offered at Cornell from its inception, a bona fide graduate school was not created until 28 years later. And the founding of the first of what are now known as "professional schools"—the College of Law—played a catalyzing role in the creation of that graduate school as well as Cornell's other colleges.

The Graduate School

Technically, a graduate student enrolled at Cornell during its first two decades was someone still affiliated with the university who had taken a first degree (at Cornell or elsewhere). Thus a graduate student could be in one of several states: (a) registered for and pursuing an advanced degree, (b) registered for and pursuing a second bachelor's, or (c) registered for an advanced degree but not on campus. In this third state, the student might be studying at another university. Basically, a Cornell graduate student was a citizen of the university at large rather than a matriculant of a particular college on campus. In 1879, a standing committee was appointed to review applications and the General Faculty's Committee on Graduate Work established the rules governing graduate study and candidacy for advanced degrees. Prior to that, individual faculty dealt with graduate studies directly, reviewing residency and language requirements, courses of study, and credit for study at other institutions.

The academic experience of graduate students in the 1880's was not very different, in many ways, from that of today's student. For example, Professor Waterman T. Hewett, in his 1885-86 report, noted,

During the past year one Fellowship has been held by a student in the modern languages, Mr. Charles Bundy Wilson. Mr. Wilson graduated at the University in 1884 with an excellent general record. After spending one year in study in France and Germany, he returned to complete his studies for the master's degree. During the year he has pursued a course of study in the literature and philology of the French and German languages. ...He has submitted an original investigation of the "Syntax of the Middle High German Popular Epics and of New High German" as his thesis for the master's degree. In accordance with the statute requiring a certain amount of assistance from the holders of Fellowships, Mr. Wilson taught one section of Freshman German during the fall term.

The need to bring some order to these processes was recognized early in the term of Cornell's second president, Charles Kendall Adams, who reported in 1891-92 that when he became president

graduate work had not been carefully regulated or defined. Students who had already taken the baccalaureate degree had been encouraged to come to the University for further study; but no provision had been made for efficient guidance of their work. Members of this class were required to remain at the University a certain length of time; but they were under no general direction, and had no systematically arranged final examinations. The subject was soon taken into careful consideration by the Faculty, and as the result of long discussion, the system of majors and minors, essentially the same as the German *Hauptfach* and *Nebenfach*, was adopted, and, without essential modification, has been continued down to the present day. On the one hand it insures regularity and efficiency of work, while on the other it provides that the student pursuing graduate studies shall be under the specific direction of the professors in charge of the work in which he is specially interested.



Here then was the blueprint of graduate school administration that continues to this day at Cornell:

- Control of graduate education at an institution-wide level by a faculty committee of the whole,
- The German system of majors and minors that eventually evolved into the system of graduate fields of study in use today, and
- Examination for degree by a special faculty committee for that purpose and that specific candidate.

A fourth element, a written thesis based on original and meritorious scholarship, had been required since at least 1870. As of 1885, successful candidates for advanced degrees were required to print copies of their theses and deposit them with the university library (one copy for a master's thesis; ten for a doctorate).

Morris Bishop described the events that precipitated the creation of a formal graduate school at Cornell:

Until 1886-87 Cornell was ruled by a single faculty. In that year came the College of Law, with purposes and methods so particular that its professors met separately. From this precedent the professors in other fields argued that they were properly colleges with their own rights and privileges. The trustees therefore reformed the organization, and in 1896 decreed that Cornell University comprehends the Graduate Department, the Academic Department (or Department of Arts and Sciences), the College of Law, the College of Civil Engineering, the Sibley College of Mechanical Engineering and Mechanic Arts, the College of Architecture, and the College of Agriculture. "The New York State Veterinary College is administered by Cornell University, and its work is organically connected with that of the University." Further, the faculties would consist of the University Faculty and of separate faculties for each college and for the Graduate and Academic Departments.

As professional schools were added to Cornell's matrix of educational offerings and technical studies in agriculture and engineering expanded, the university revisited the question of what academic disciplines could be the focus of a master's or doctoral degree. Cornell's third president, Jacob Gould Schurman, reported to the university trustees in 1904-05:

The University has never restricted the nature of the work leading to the A.M. or the Ph.D. degrees. That work may lie in the field of the humanities or of the sciences or it may even fall within the scope of technology, but in that event it must be pursued for a scientific purpose and in a scientific spirit. But while Cornell, like the German universities, has given the graduate student unlimited freedom in the choice of his specialty, it has hitherto admitted to the Graduate Department only those who have taken a degree substantially equivalent to that required for graduation in the College of Arts and Sciences. But a graduate of a technical college might desire, for example, to pursue the advanced study of physics, mathematics,



or chemistry with a view to qualifying himself for a professorship. It seemed unfair to exclude such a one from the privileges of the Graduate Department. And while the University Faculty were not prepared to formulate at the present time a rule applying to all institutions, they voted that any graduate of any four year course in any College in this University might under the usual rules be admitted to the Graduate Department as a candidate for the degrees of A.M. and Ph.D. Of course it is only the exceptional graduate in engineering, medicine, or agriculture who will be willing to renounce the practice of his profession for the sake of scientific study and research; but as such graduates have presumably a special bent or talent for investigation it is all the more important to make provision for them.

It was this decision of Cornell's faculty in the beginning of the twentieth century that caused the Graduate School to become the umbrella organization for most of the advanced studies at the university.

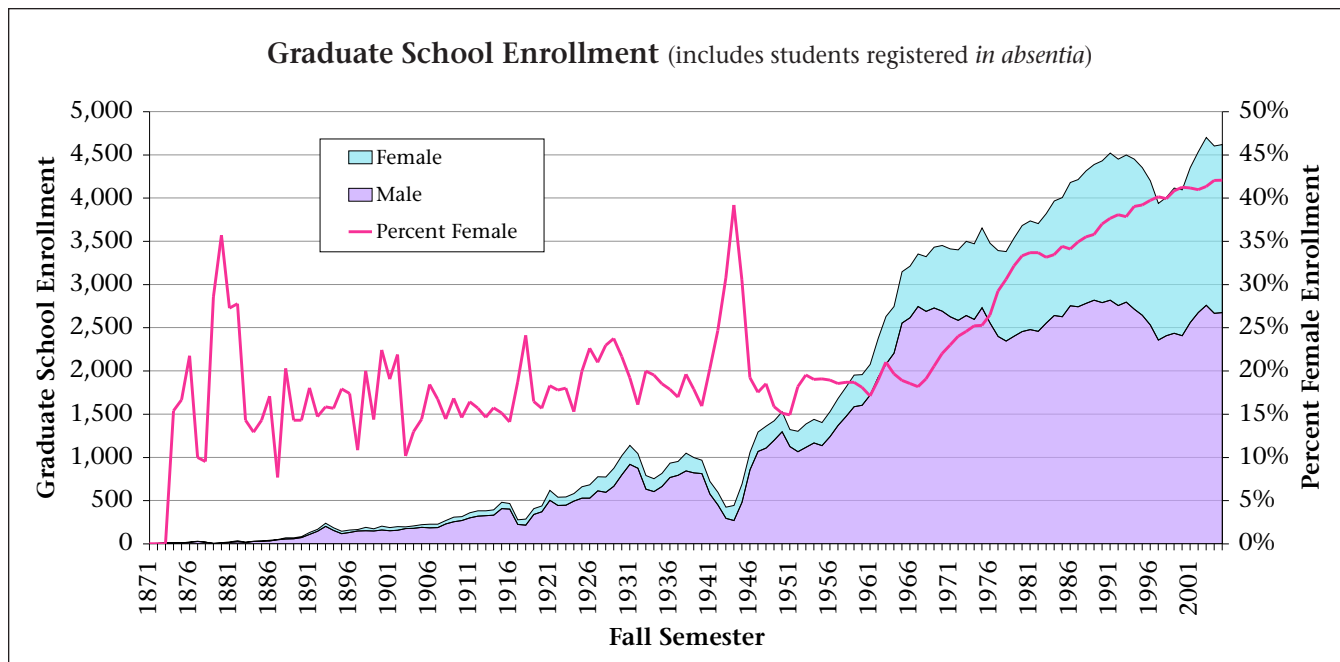
From 1896 through 1909, the Graduate Department was under the immediate charge of the General Faculty and was administered by the Dean of that faculty. In 1907-08, a faculty committee recommended that

beginning [in] 1909, there should be created a Graduate School with a faculty of its own, consisting of professors who in each year are actively engaged in supervising the work of graduate students as members of special committees in charge of major or minor subjects, these professors to be designated by the President as soon as possible after the registration of graduate students in each year. The committee also recommended the creation of a new office, that of Dean of the Graduate School, the duties of that officer to be to serve as executive officer of the Graduate Faculty as above constituted and to conduct the work of the Graduate School under the direction of the Faculty of that School.

These changes were approved by the Board of Trustees in April 1909 and implemented in the following fall semester. The reconstituted Graduate School (which included faculty from "groups of the Arts, of Pure Sciences, of Constructive Sciences, and of the sciences represented in the Colleges of Agriculture, of Medicine, and of Veterinary Medicine") organized a General Committee and divided itself into five groups:

- A. Languages and Literatures.
- B. History, Political Science, Law, Philosophy, Education.
- C. Mathematics, Astronomy, Physics, Chemistry, Geology, Physical Geography.
- D. Biological Sciences.
- E. Engineering, Architecture, Applied Physical Sciences.

GRADUATE AND PROFESSIONAL EDUCATION



Ernest Merritt, the first dean of the Graduate School, reported on changes in graduate education that were implemented almost immediately, including establishing the right of every member of the Graduate Faculty to attend any examination of a candidate for advanced degree. In Dean Merritt's view,

Too much systematization—or standardization—is to be deplored in all lines of teaching; but it is especially to be avoided in the case of graduate teaching, where the individual and personal element plays so important a part.

[Yet the Graduate Faculty recognized that] in all cases certain obvious requirements are made, a definite minimum period of residence, the mastery of some one subject, adequate acquaintance with allied subjects, the passing of a final examination, and the presentation of a satisfactory thesis.

As the graph above demonstrates, enrollment in the Graduate School has changed dramatically, increasing from 2 students in 1871 to 4,621 by 2005. The substantial growth after World War II reflects the increase in support for graduate students in the sciences due to the expansion of federal research support. Women have been candidates for degrees almost from the inception of graduate studies. (Two women were registered in 1874.) From 1874 through 1970, female enrollment fluctuated between 15 and 20 percent of the graduate student body (with occasional spikes in enrollment related national events that tended to draw or drive men out of higher education in greater

proportion). The revolution that brought women greater social equality in America during the latter half of the twentieth century also increased participation in graduate studies, doubling the percent of women in the Graduate School, from 20 percent in the 1960's to 42 percent currently. The overall enrollment growth from 1970 is due to the increase in women graduate students; male enrollment in 2005 of 2,677 was little changed from the 1970 level of 2,693.

The first woman to earn a Ph.D. at Cornell was Mary (May) G. Preston. As described by Charlotte Conable,

In 1880, Cornell University awarded to May Preston a Ph.D. degree, the first such degree granted to a woman at this institution. After serving as a professor of Greek and English, May Preston Slosson moved to Laramie, Wyoming, where she was appointed by the governor to serve as chaplain of the State Penitentiary for Men, reputedly one of the first women to hold such a position.

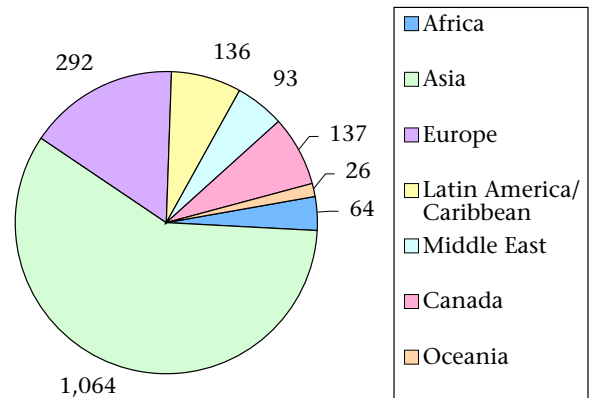
May's graduate work was in philosophy and her thesis was entitled "Different Theories of Beauty." She was interviewed by Florence Hazzard many years later and observed that the four faculty who examined her for her degree in 1880 "'compromised' on a harder course" for her than was required for male candidates at the time. As May noted, female students at Cornell in that era were "a picked lot," having a deep sense of responsibility. Their conduct had to be "impeccable—couldn't be frivolous—were conscious of being pioneers." The examination by this committee was

grueling, lasting one week and taking 8 hours per day.

Cornell's Graduate School has also been home to a great flow of international scholars. (See graphs below and at right.) In the 1890's, international students comprised about 7 percent of the School's overall enrollment. In the period between the two world wars, that fraction grew to 10 to 15 percent, and immediately after World War II the international graduate student population doubled, averaging around 25 percent. In the 1980's a fourth growth spurt occurred as the level climbed into the 40 percent range that exists today. Cornell has for many years enjoyed a strong attendance by students from the People's Republic of China, Hong Kong, and Taiwan. Between 35 and 40 percent of all international students in the Graduate School came from China in the 1920's and 1930's; today Chinese nationals represent about a quarter of all international students. The racial/ethnic diversity of the Graduate School's domestic students has also gradually increased. In 1980, the first year that accurate statistics were kept, 7.5 percent of domestic students were minorities and 5.9 percent were under-represented minorities (American Indian, black, and Hispanic). By 2005, those fractions had increased to 22.9 and 10.5 respectively. (See graph on page 16.)

Origin by Region of International Students Registered in the Graduate School for Fall 2005

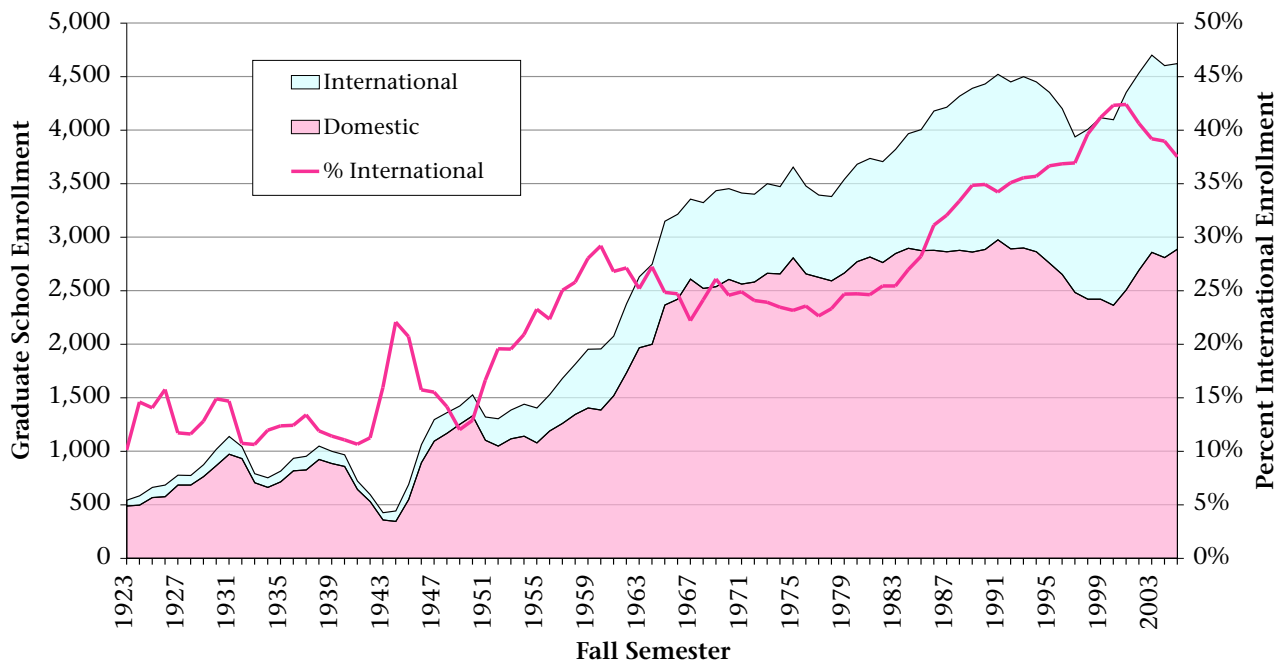
(excludes students registered *in absentia*)

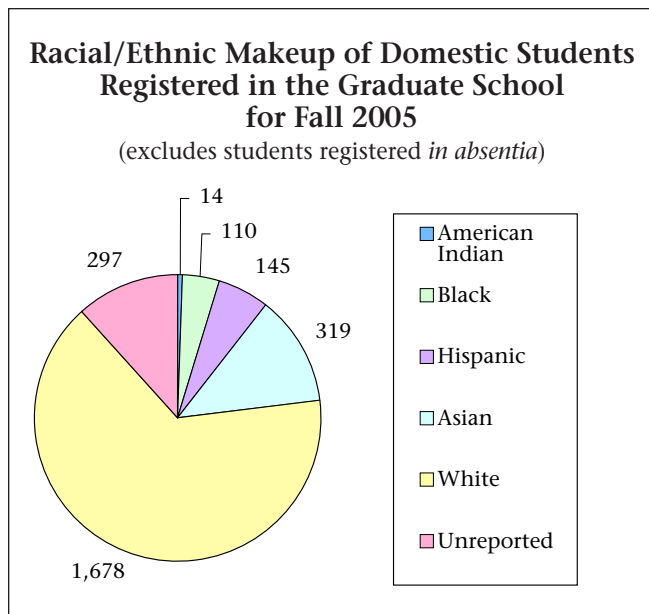


While the size of the Graduate School staff, the number of fields, and the nature of the issues that it has had to address have changed over the years, the basic framework governing graduate education that was created at the end of the nineteenth and the beginning of the twentieth centuries remains in place.

International Student Enrollment – Graduate School

(includes students registered *in absentia*)





The Law School

When Andrew D. White wrote to Gerrit Smith in 1862, hoping to jog loose some of Smith's ample wealth to help found a new university, White itemized nine principles that would guide "a truly great university," one of which was "to secure the rudiments, at least, of a legal training in which Legality shall not crush Humanity." While Smith begged off in helping White on his educational mission, White maintained his belief that legal education should be part of any great university, later incorporating it in his design for Cornell University. According to Morris Bishop,

White had proposed a school of law in... 1866 and had renounced the idea only for financial reasons. In his final report, for 1885, he asserted that the time was at last ripe. ...To make a law school one needed, after all, only a small library and a few professors. Special committees of the trustees ...advised a two-year course, with an entrance requirement equivalent to one year of high-school work—whereas four high-school years were demanded for entrance to Arts or Engineering. It is true that such easygoing requirements were normal, that no graduate school of law yet existed in the country; nevertheless many thought that Cornell stooped too low in its effort to attract students. Thanks to alumni protests, the entrance requirement was soon stiffened.

At the time, attending a law school was not the only path to becoming a lawyer. As Bishop noted further,

The school prospered and attracted students. It made a specialty of pleading and practice, with an abundance of mock trials. The case system was used from the beginning, though not exclusively. However, Judge Cuthbert

Pound '84 said at the dedication of Myron Taylor Hall in 1932 that the original school was in no sense a *university* law school; "it was merely a good place for time-saving organized and systematic study of the law, in lieu of the desultory law-office clerkship or apprenticeship then in vogue."

The Board of Trustees subcommittee charged in 1885 "to consider and report...on the practicability and expediency of the early establishment of a Law Department in the University" returned in June 1886 with a recommendation to proceed. As designed, the new Cornell school would grant a bachelor of laws degree (LL. B.). The report noted that while peer institutions with law schools (e.g., Columbia, Harvard, and Yale) all had two- or three-year curricula, only one year of study was required by New York State for admission to the bar. The subcommittee admitted that if it were "free to consider the question from what may be called an ideal point of view, probably a course of three or four years would seem desirable." However, given New York State's limitations, the subcommittee was "practically limited to a normal period of two years." The subcommittee noted further the great advantage of siting a law school within a university, pointing out that at Columbia and Harvard, law students who studied beyond the requirements of their LL. B. degrees could pursue master's and doctor's degrees. The subcommittee envisioned

A judicious arrangement by means of which students pursuing their law studies could also take elective instruction in the department of History and Political Science would to a large extent, at least, remove the temptation to abandon the law school after a single year of study.

The linkage to the Department of History and Political Science was achieved by the appointment of Professors Moses Coit Tyler (the first professor of American History in the United States) and Herbert Tuttle, both already members of Cornell's faculty, to the Law School faculty. The subcommittee also recommended that "there would be unmistakable advantages in having at least a part of the teaching force actively engaged in the practice of the courts," and so envisioned a mixture of resident professors and nonresident lecturers "drawn from cities in the vicinity."

As to tuition policy, the subcommittee proposed that a tuition fee "should be required of all students of the new department," in essence a deviation from the university practice at the time. The issue was resolved by the trustees in 1887, when they determined that



Boardman Hall – Constructed to house the Cornell Law School (1892 to 1932) – E. E. Willever, librarian

organization of the Law Department is independent of the Literary Department [i.e., Arts and Sciences], and not within the statutes providing for post graduate studies, and the students in such department are not entitled to exemption from tuition fees, unless holding a State scholarship, or the degree of LL. B. from this University, or some other college or school of good standing.

The Law School's first home was Boardman Hall, which was constructed from the proceeds of a mandamus procedure instituted by the university against the New York State comptroller over the state's mis-handling of Cornell's Land Grant fund. The \$89,384 appropriated to Cornell by the state legislature as an arrears payment was sufficient for the new building.

In 1889-90, the School reported that its registration had almost doubled in two years, from 55 to 106, including international students from Canada, Germany, and Japan. The curriculum had been expanded to include graduate education leading to a master's degree, toward which seven students were engaged.

Entrance curricular requirements were changed several times: in 1892, based on a New York Court of Appeals action to increase the requirements for a law student's

certificate; in 1899, when a third year of instruction was instituted; in 1911, when a year of college work was made a requirement for admission; in 1919, when the number of years of college work was raised to two; and in 1925, when it became a graduate school. These changes were encouraged by President Schurman, who believed strongly in the fundamental value of liberal undergraduate education prior to professional study. A second factor was the impact of the Bar of the State of New York, which continued to adjust rules for admission to the bar. A third factor was the influence of national societies, which pressed for enhanced law school entrance requirements. In 1921, the Carnegie Foundation for the Advancement of Teaching published *The Study of Legal Education*, which contained the recommendations of the American Bar Association that every candidate for admission to the bar should be a graduate of law school that: (a) required at least two years of college study for admission, (b) required three years of study in the law curriculum, (c) provided its students adequate library collections and facilities, and (d) had a sufficient number of full-time teachers.

GRADUATE AND PROFESSIONAL EDUCATION

In 1968, Cornell's trustees voted to discontinue the Bachelor of Laws degree and substitute for it the Doctor of Law (J.D.) as the first professional law degree. A year later, under authority granted by the New York State Board of Regents, the university conferred the J.D. degree retroactively to the 1,330 living alumni who held the LL.B. degree. This group included 46 women and extended back to the class of 1906.

Currently, the Law School is housed in Myron Taylor hall, which as described by Morris Bishop was

given by Myron Taylor '94, chairman of the Board of the U. S. Steel Corporation, government servant in matters of world moment, Ambassador to the Vatican.

Taylor hoped that Cornell's Law School would become a center for international law, although a special program in international affairs would not be created until 1948. Today, the Cornell Law School remains relatively small compared to its peers, but it provides a wide array of educational offerings, including many that fulfill Taylor's dream of international exposure. Three advanced degrees are offered: the J.D., which is a professional degree; the Master of Laws (LL.M.); and the Doctor of Science of Law (J.S.D.).

In 1922, Dean George G. Bogert wrote in his annual report to President Livingston Farrand:

The Faculty is unanimously of the opinion that a school of from 150 to 200 students is the *desideratum*. Such numbers insure a reasonable amount of competition among students, without rendering the sections so large as to prevent frequent contact between teacher and student and strong influence by the Faculty upon mind and character.

While the School's enrollment is above that *desideratum* (hovering around 600, with 90 percent of that total enrolled in its J.D. program), its size is decidedly below that of some of its peers (e.g., Columbia at 1,200, Georgetown at 2,000, Harvard at 1,900, Penn at 900). The School still sees itself as

A small, top-tier law school...[that] draws on, and contributes to, the resources of a great university, consistently producing well-rounded lawyers and accomplished practitioners cut from a different cloth.

The College of Veterinary Medicine

Morris Bishop described the event that led to the founding of Cornell's College of Veterinary Medicine:

In March 1868 [Andrew D.] White went abroad, to visit model institutions, to buy books and equipment,

to collect professors. ...According to an oft-repeated anecdote, told in White's *Autobiography*, Ezra Cornell saw White off in New York, and as the ship drew away from the pier he cupped his hands and shouted across the gap: "Don't forget the horse-doctor!" ...[White] found the horse doctor...James Law, educated in British and French institutions, professor in the Veterinary College of Edinburgh, a true scientist, a man of force and vigor. Dr. Law was to be one of the great pioneers of American veterinary science, and the efficient first cause of Cornell's Veterinary College.

As Waterman Hewett noted,

When the university opened, in 1868, a room was allotted to the veterinary department on the second floor in the one completed building now known as Morrill Hall, while for museum and laboratory uses it had a room in the basement of the same edifice. The beginning was modest, indeed, but it shared with others in the day of small things, and hope was nurtured by the expressed purpose of President White to have it developed into a veterinary college.

Initially, Professor Law was appointed to the College of Agriculture (veterinary science was offered as one of the seven courses available in the college). In 1871, Cornell awarded its first Bachelor of Veterinary Science (B.V.S.) to Myron Kasson, and in the following year the second went to Daniel Elmer Salmon. In the *Cornell University Register* for 1872-73 is a description of a new advanced degree being offered by Cornell, the Doctor of Veterinary Medicine (D.V.M.), that would be "conferred on those students who have spent two years in additional study, after receiving the degree of B.V.S., and who shall have passed satisfactory examinations therefor." The first D.V.M. degree awarded by Cornell (and the first awarded in the United States) went to the same Daniel Salmon,* in 1876.

For 28 years, Professor Law lobbied state legislators to provide proper funding for a college of veterinary medicine at Cornell, which he envisioned as separate from agriculture. Law succeeded in achieving his goal by unleashing what has been called "a gauntlet of letters, visits, speeches, and editorials" that argued the

* Dr. Salmon had a distinguished career, organizing and heading the U.S. Bureau of Animal Industry (BAI) within the U.S. Department of Agriculture. He identified the infectious pathogen *Salmonella*, which today bears his name. At the BAI, Salmon "...became the country's most influential veterinarian. He staffed his laboratory with other Cornell graduates, Frederick L. Kilborne, Theobald Smith, Cooper Curtice, and Veranus A. Moore. Under his guidance, they became the country's foremost veterinary scientists."



James Law – Professor of Veterinary Medicine (seated lower right)

case. Waterman Hewett reported that in 1894 New York State Governor Roswell P. Flower desired

to call the attention of the legislature to the advantages offered by the State Land Grant College, Cornell University, for carrying on the scientific work of agricultural promotion, which is now divided among several agencies and which should be concentrated under the direction of such a bureau as I have recommended. ...The proper diffusion of knowledge...could be obtained through such an agency. The same is true of the spread of veterinary science.

Cornell's trustees placed the following conditions on accepting these appropriations:

That the Board of Trustees authorize the location on the University grounds of the State Veterinary College and express their willingness, when the State shall have made sufficient provision for buildings, equipment, and maintenance, to administer the State Veterinary College in such a manner as may be hereafter agreed upon, subject, however, to the condition, that the University is not to undertake any part whatsoever of

the financial responsibility connected with the State Veterinary College, whether for buildings, equipment, care, experimentation, investigation, instruction, or any other object, though for the sake of reducing the cost of maintenance to the State, the University consents to furnish instruction to students of the State Veterinary College in such scientific and other subjects as are now or may hereafter be included in the curriculum of the University, upon such terms as may be deemed equitable, regard being had to the fees paid by University students for instruction in such courses.

The state legislature responded by appropriating \$50,000 in 1894 and \$100,000 in 1895 to house and equip the New York State Veterinary College. In 1896, the state began an annual appropriation of \$25,000 for operations. The College's unusual genesis posed a unique set of administrative problems that required novel solutions, each of which helped to define Cornell's contractual relationship with the state. For example, because most of the instruction for the first two years of this four-year course would be provided

GRADUATE AND PROFESSIONAL EDUCATION

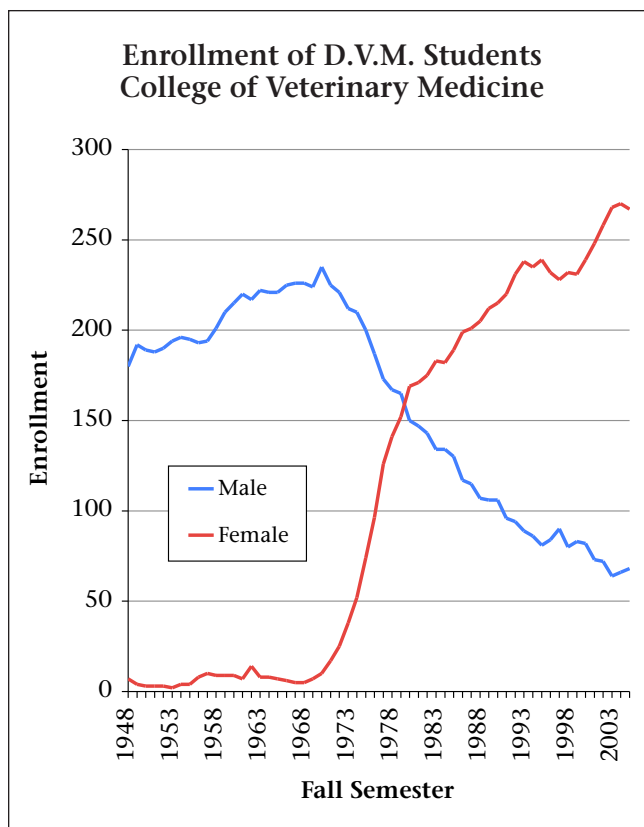
by faculty in other colleges at Cornell, the trustees specified that the \$100 annual tuition charge be split 67:33 between Cornell University at large and the College for the first two years, with the entire \$100 being credited to the College during the final two years. A governance structure—the Veterinary College Council—was created in 1897 to make “rules and ordinances for the administration” of the College.

The College elected to provide a three-year course leading to a D.V.M. degree (not to be confused with the advanced degree awarded in 1876). By increasing entrance requirements, the College gradually transformed this degree. In 1905, four years of high school education were required for admission (it had been two years). In 1916, high school graduation was required, and the D.V.M. course was extended to four years, placing the College on par with the other academic programs at Cornell. Following World War I, the number of veterinary students in the U.S. dropped from 2,487 in 1914 to 531 in 1922 (of whom 80 were at Cornell). Then the nation’s improved economy and the shift in veterinary focus to include small animals enhanced the demand for veterinarians nationally. Morris Bishop described the impact of these changes on the College: “Its enrollment rose to a maximum of 214 in 1931-32. Thereafter one year of college work was required for entrance to its four-year course, with the result that registration dropped off somewhat.” The College began, for the first time, limiting enrollment, and for the 1934-35 academic year accepted only 37 freshmen from an applicant pool of 116, all of whom were generally qualified. As Bishop noted,

The College took advantage of its popularity to raise, in 1948, its entrance requirement from one year of college work to two. The course became more exacting, with emphasis on nutrition, roentgenology, medical botany, genetics, food hygiene, virus diseases. Didactic methods were largely abandoned, and the final year was given almost wholly to clinical teaching by the case method.

In 1972, the College increased the minimum to three years of college study, and while the majority of current applicants hold bachelor’s degrees, the College will accept three years of undergraduate work.

In his 1952-53 annual report, Dean William A. Hagan noted that through that date there had been 37 women who had graduated from the College with the D.V.M. degree since its founding. He also noted that there was external pressure to limit the number of women accepted into the program:



As long as the most pressing need in veterinary medicine is for more rural practitioners to care for the food-producing animals, as long as the Armed Forces, the U. S. government, the state governments, and the majority of private practitioners want men rather than women veterinarians, we do not believe that we would be serving the public well by accepting many women students under present conditions when educational facilities are short and each woman taken automatically displaces a man.

Dean Hagan did note, “When present pressures diminish, I am sure that we will accept them in greater number than we have been doing in recent years.” As the graph above shows, such conditions began to change about 20 years after Dean Hagan made his remarks. Currently, the College enrolls about 330 D.V.M. candidates, and about 80 percent of them are women. The College’s four-year D.V.M. curriculum is science-based, comprehensive, and interdisciplinary, providing students with a breadth of knowledge and an opportunity to specialize. In addition to exposure to biomedical and clinical disciplines, students delve into topics related to veterinary practice such as communication skills, client relations, ethics, public health, practice management, and professional development.

The Medical College

Unlike most other professions, there is a long history of formal modes of education in the area of human medicine. A medical school was established in Salerno, Italy before the twelfth century, and medicine was taught at almost all major European universities during and after the Middle Ages. In the eighteenth century, the value of hospital training came to the forefront and developed into a training system, especially in Britain, that combined lectures given by private practice physicians with the accompaniment of physicians on rounds in hospitals. In rural areas lacking hospitals, the medical student would live with the physician, paying a fee and performing various chores, including household duties, while learning on the job. While there were but 4 medical schools in the U.S. in 1800, 26 were founded between 1810 and 1840 and an additional 47 between 1840 and 1875. The expansion in the number of proprietary medical colleges in America during the nineteenth century had the pernicious effect of diminishing the quality of medical education. John Duffy has described that “even at the best schools it was possible to acquire an easy degree.” Being funded almost entirely by tuition fees, they had to accept almost any applicant and could not afford to dismiss weak candidates. Compounding this, the state licensing of physicians was abolished in most states in the 1840’s. As Duffy noted,

As late as 1887 an officer of the Maine State Board of Health had an eight-year-old girl apply in her own handwriting for admission to a number of medical schools. Although she stated that she had none of the requirements for admission, over half the schools accepted her application, several of them assuring her that the examinations for a degree were not difficult. Even in the best schools there were few obstacles to graduation. As of 1870, examinations at Harvard Medical School consisted of nine professors spending five minutes each questioning the candidate. To pass the examination, it was only necessary to satisfy five out of the nine professors; thus a candidate could fail four out of nine medical subjects and still obtain his degree. ...Dr. Simon Flexner, who acquired a medical degree from a two-year school in 1890, wrote: “I did not learn to practice medicine...indeed I cannot say that I was particularly helped by the school. What it did for me was to give me the M.D. degree.”

While Andrew D. White was busy in 1866 with his assignment to develop a plan of organization for the newly created Cornell University, Drs. Egbert Guernsey and John Carnochan approached Cornell’s trustees

with a proposal to found a medical department in New York City. The trustees tabled the request, being well aware of the inadequacies and ineptitudes of medical education in America at the time. Yet, as Morris Bishop noted, “In Andrew D. White’s concept of an ideal university, a medical school had been an essential unit.” Three more proposals to create a bona fide medical school at Cornell were floated before a proposition was made that would meet the trustees’ stringent criteria. In March 1898, Cornell’s trustees were summoned to a special meeting to hear Colonel Oliver H. Payne’s proposal to underwrite Cornell’s first medical department. As described by Bishop, Payne was the “wealthy son of a Standard Oil founder [who] became interested in medicine through his college friend from Yale, Dr. Lewis A. Stimson, a famous surgeon, and through the ministrations of his physician, Alfred L. Loomis.” Loomis and Stimson were associated with the medical college at New York University (NYU). Colonel Payne served as an NYU trustee, and when a fundamental disagreement arose between Stimson, Loomis, and other physicians associated with the college on the one hand and the university administration on the other, the physicians, joined by Payne and others, decided to secede from NYU. “The newly separated faculties, feeling the need of a university connection, considered Yale, Dartmouth, and Princeton” before settling on Cornell. “Most of the faculty of the [NYU medical school] and four from the Bellevue Hospital Medical College joined the new establishment, accompanied by 215 of their students.”

Cornell’s trustees placed five conditions on founding of this new medical college:

- (1) Cornell...would not establish a medical department which is to be supported by students’ fees. There must be capital for buildings, equipment, apparatus, and other facilities needed for instruction and investigation, and there ought to be an endowment for maintenance.
- (2) Cornell...must have the same absolute and unrestricted control of its medical department as it has of every other department of the University. While educational matters will be left in the hands of the faculty, of which the President will be ex-officio chairman, appointments will be made and business of every kind conducted by the Board of Trustees.
- (3) The medical department, like every other department of the University, must be open to women on the same terms as to men.
- (4) The medical department must receive state scholars without charge for tuition on the same terms and conditions as other departments of the University.
- (5) It is desirable that a portion of the medical course should be given in Ithaca as well as in New York—say, the first year or two.

Beginning in 1898-99 and continuing through 1918-19, Colonel Payne's gifts to the Medical College funded facilities and equipment, underwrote the college's budget, and provided a substantial endowment. His gifts covered three-quarters of the daily operating costs of the College through 1912-13. His endowment of the Medical College, which totaled \$4.85 million in 1919, was the university's second largest single endowment fund at the time and represented one-third of Cornell's total endowment. Overall, he donated \$7,668,267 (about \$400 million currently), making him one of Cornell's most substantial benefactors.

The college thus founded was split programmatically, with an initial two-year course focused on scientific fundamentals offered in Ithaca followed by a second two-year course centered on the medical discipline that was offered in New York City. The Ithaca course was relocated to Stimson Hall, a facility constructed specifically for that purpose using a donation from Dean Sage and named after the above-mentioned Dr. Stimson. The New York City program operated out of a facility built by Colonel Payne on First Avenue, between 27th and 28th Streets. From the beginning, it was expected that most students (and all women students) would start at Ithaca and progress to New York City for the clinical completion of their degrees. Initially, because the M.D. was viewed as a "first degree," not an advanced degree, admissions requirements were somewhat comparable to that of a bachelor's program.

In 1907, Harvard and Johns Hopkins Universities mandated a bachelor's degree for admissions to their medical colleges, and one year later, Cornell followed suit, transforming the Medical College into a graduate school. Nationally, the Carnegie Foundation for the Advancement of Teaching released Abraham Flexner's 1910 report: *Medical Education in the United States and Canada*. It was an unblinking review of the 155 North American medical colleges then in existence. And while Cornell received a favorable review, many medical colleges did not* and a number were forced

* Of the Pulte Medical College, a proprietary school located in Cincinnati, Ohio, the report noted: "Anything more woe-begone than the laboratories of this institution would be difficult to imagine. ...A disorderly room with a small amount of morbid material and equipment is known as the pathological and bacteriological laboratory. The chemical laboratory contains a few desks, with reagent bottles, mostly empty. ...There is an inexpressibly bad dispensary in the school building."

to increase standards or cease operations. With the increase in admissions requirements, the Ithaca division of the Medical College devolved into superfluity, closing in 1937-38. The Medical College affiliated with what is now New York-Presbyterian Hospital in 1927, and in 1932, the two institutions opened their joint campus/hospital complex on the Upper East Side of Manhattan. In 1952, the trustees created the Graduate School of Medical Sciences, and the University Faculty transferred responsibility for "advanced general and professional degrees granted for study in residence at the New York City campus" to this entity.

The College was officially renamed The Joan and Sanford I. Weill Medical College and Graduate School of Medical Sciences of Cornell University in 1998 to recognize the Weills' significant leadership and support. Today, the College maintains major affiliations with New York-Presbyterian Hospital, Memorial Sloan-Kettering Cancer Center, Rockefeller University and the Hospital for Special Surgery, as well as with the New York Metropolitan-area institutions that constitute New York-Presbyterian Healthcare System.

A recent educational initiative has been the opening of a branch medical college in Doha, Qatar, which was established in 2001 under an agreement between Cornell and the Qatar Foundation for Education, Science and Community Development (QF), a private, non-profit organization set up in 1995 by Sheikh Hamad Bin Khalifa Al-Thani, Emir of the State of Qatar. This offering provides a complete medical education leading to a Cornell University M.D. degree, and comprises a two-year premedical program followed by a four-year medical program. The program's academic standards and admissions requirements are consistent with those in New York. The Qatar campus expects to confer its first M.D. degrees in 2008.

The Business School

In his 1866 *Plan of Organization* for Cornell University, Andrew D. White called for a "Department of Commerce and Trade," of which, Morris Bishop noted,

no example then existed in an American university. At the Faculty meeting of 2 October 1868, just before the University opened, White suggested the creation of a professorship of bookkeeping. A penciled note by White in the Faculty Records adds: "This was in view of the establishment of a higher sort of commercial college as a Department of the University." If he had had his way,

he would have given Cornell priority over the Wharton School of the University of Pennsylvania, founded in 1881. Cornell's first *Register* announces courses in bookkeeping, accounting, and commercial mathematics, but it does not appear that the subjects were actually taught.

President Schurman, in his annual report for 1915-16, reminded the trustees that

from its foundation the University has laid stress upon vocational training and the preparation of students for practical or public affairs. It is recognized on an equal footing with the older professions of law and medicine and the newer callings of the engineer, the architect, the veterinarian, and the scientific farmer.

The President further recognized that the

University has offered a variety of courses of instruction in different colleges with a distinctive vocational value for the education of business men. And it is asserted on competent authority that Cornell already offers more of the essentials of an adequate business education than any other university which has not yet organized a special curriculum in this field.

Schurman then reported that a University Faculty committee had studied the situation and recommended the creation of a new college of business administration that would organize the disparate business-related courses across the institution and add new ones

"...around a central core of purely vocation courses of a type not as yet largely developed at Cornell." This "core" would include courses in business organization and administration, in accounting, in the problems and technique of specialized forms of business such as insurance, foreign, trade, and foreign exchange.

The faculty committee weighed the advantages and disadvantages of making this new school an undergraduate institution of the type already in existence at some western universities or a graduate school like the one founded at Harvard in 1908. The committee

recommended that the college of business administration proposed for Cornell should be a technical school of business training so organized that its work could be joined to that of any of the undergraduate colleges of the University. ...[as] a university training in business should not be limited merely to men educated in the liberal arts but should be open equally to men who have been trained in law, engineering, agriculture, etc.

This arrangement would have created a novel arrangement at Cornell, as the proposed college would be "a professional school of semi-graduate standing." The trustees weighed in and voted that the college should

include courses of instruction designed specifically as "preparation for the public service" and they thought provision should be made for the foundation of a library

of commercial bibliography and for the erection of a building for the purposes of the college.

President Schurman noted that the "University has pledged itself to establish such a college as soon as the necessary endowments are provided for the purpose." None came (about \$1 million was needed; roughly \$43 million currently), and the idea was dropped.

The concept lay dormant for 20 years, and then, in 1938, the trustees heard a proposal from President, Edmund Ezra Day on "the lack of facilities...for training in business administration and for government service." According to Morris Bishop, "This project was particularly dear to the President, who had organized and deaned the School of Business Administration at Michigan." The trustees authorized a study "as to the advisability of the establishment of a School or College of Business and Public Administration in the University," but, as Bishop observed, "the preparations... were interrupted by the war." In 1942, the trustees authorized the concept of such a school but delayed the implementation. In designing the program to include both business and public administration the review committee noted that the combination

is desirable to create as the predominate purpose of the school the training of men for efficient service and not primarily for profit-making. This combination might also lead to a better understanding between business and government through public administration.

The School was finally launched in September 1946, operating out of Goldwin Smith Hall and awarding Master's of Business Administration (M.B.A.) and Master's of Public Administration (M.P.A.) degrees. From its inception, the School developed close working relations with other colleges at Cornell, offering instruction specifically tailored to students in the School of Industrial and Labor Relations and the Law School. A new facility was constructed for the School in 1963 and was named the Deane Waldo Malott Hall after the sixth president of Cornell. In 1983, a trustee-led task force reviewed the School's program and resources and recommended three changes: (a) that the School's concept of training and management be broadened and greater collaboration with Cornell's other faculty be developed, (b) that the size of the faculty and the School's financial support base be increased, and (c) that the programs focused on hospital administration and public affairs be discontinued. These changes were set in motion; the School was renamed the Graduate School of Management. In the following year, Samuel

C. and Imogene Powers Johnson established a trust to provide ongoing support for the School and it was renamed the Samuel Curtis Johnson Graduate School of Management to honor Mr. Johnson's great-grandfather. From 1993 through 1998, the university undertook the complete renovation of Sage Hall to serve as the new and modern home of the Johnson School.

Currently, the Johnson School offers four M.B.A. programs and a Ph.D. program. The M.B.A. programs include Ithaca-based residential experiences of either one or two-year lengths and two off-site executive-education offerings, one of which is in collaboration with Canada's Queen's University.

GRADUATE STUDENT SUPPORT

In Ithaca, graduate student support comes in a variety of forms, including payment of tuition (which is intertwined with the institution's tuition-setting policies), stipends, and other benefits (such as healthcare and childcare). Other assistance—for such items as the costs of research, attendance at scholarly meetings, and scholarly publishing—varies widely by discipline.

Tuition Policies

When Cornell was founded, the institution operated on a trimester system and charged undergraduate students \$10 per trimester. Students who held bachelors' degrees but remained affiliated with the university after graduation—the original definition of a graduate student—were not charged tuition. There were three reasons for this practice: (a) the small number of graduate students at the time (averaging less than 4 percent of the student population for the first 20 years of operation), (b) the desire to retain graduate students at American universities, and (c) an interest in educating the next generation of professors. In 1888, the trustees declared that only graduate students who were properly admitted as candidates for advanced degrees would be exempt from paying tuition. (By this change graduate students who were pursuing undergraduate degrees as well as non-resident graduate students had to pay tuition.) Beginning in 1894-95, the trustees removed this exemption, levying a tuition charge against all graduate students, including those studying *in absentia*. Further limitations were set in 1906, when the trustees required that master's degree candidates

pay at least one year's full tuition and doctoral degree students at least three years' tuition before degrees would be granted.

Having mandated universal graduate tuition but linking tuition payment to specific colleges, Cornell created a problem that remains to this day: how to reconcile the umbrella nature of the Graduate School to the separate colleges. Graduate students are affiliated with individual colleges only through the majors that they undertake, and some of these majors span college boundaries. In 1910, the trustees decided that graduate students...be charged tuition at the rate charged in the College in which the major subject is taken, and in the case of graduate students taking no major subject that the tuition be fixed at the rate charged in the College where two-thirds of the work is done.

In 1919, the trustees again revisited the setting of graduate tuition and altered the policy, requiring that graduate students be charged: (a) an administrative fee of \$25 per year and (b) a tuition fee of \$75. The combined \$100 cost would be half of what an undergraduate would pay and graduate students whose major work was in one of the contract colleges would be exempt from the \$75 tuition fee (but not the administrative fee). Over the years, the trustees gradually raised tuition rates for the Graduate School, differentiating early on between the endowed Ithaca and contract college divisions of the Graduate School and, consistent with general tuition policy at the time, charging only the administrative fee to contract college students who were New York State residents. In January 1954, the trustees adopted a policy whereby a graduate student whose studies have been satisfactory to the Faculty is exempt from the further payment of tuition upon presenting to the Treasurer a certification from the Dean of the Graduate School that the minimum residence requirement for the Ph.D degree has been completed.

This tuition-free provision was replaced by a "reduced tuition" program, beginning in 1979-80, in which graduate students who have completed six semesters as registered graduate students at Cornell, have completed all course work, have passed the A exam, and are using Cornell facilities and services or receiving funds disbursed through Cornell shall be officially registered and pay tuition at the level of the administrative and student service charge (\$1075 in 1979-80). These students will pay, in addition, the active file fee...\$200/semester.

Graduate students who registered *in absentia* paid the active file fee only. The combination of reduced

tuition and the active file fee, which was 28 percent of full graduate tuition in 1979-80, was not increased at the same pace as full tuition and, by 1985-86, the ratio had fallen to 17 percent. Beginning in 1987-88, a series of stepped increases in graduate reduced tuition were made to realign the reduced and full rates. At the same time, Cornell initiated a study of graduate tuition policies that culminated, in 1997-98, with the elimination of graduate reduced tuition and its replacement with an enhanced system of graduate fellowships and matching programs. For 2006-07, Cornell will have three graduate tuition rates (excluding the professional school programs in law, management, medicine, and veterinary medicine), which are assigned to students based on the college locus of non-doctoral programs or the college affiliation of the chair of the special committee for doctoral programs:

Endowed Ithaca	\$32,800
Contract Colleges	\$20,800
Medical Sciences	\$24,660

Graduate tuition policies remain under review, with an Ithaca campus goal to converge on a single rate for all graduate students at some point in the near future.

Tuition Remission and Tuition Support

Throughout the changing pattern of graduate tuition policies described above, Cornell routinely modified and enhanced the mechanisms by which it paid the tuition costs of some graduate students. This tuition support took two forms, both of which were occasionally in operation simultaneously:

- Tuition might not be billed to the student or, if billed, it might be charged at a lower rate.
- Tuition would be billed, but the cost would either be waived or met by a payment of that charge from an institutional or external source.

The initial lack of any tuition charge for most graduate students through 1894-95 and the several forms of reduced tuition that persisted until 1997-98 are examples of the first form. From 1894-95 through the 1950's, students who had appointments to teach (as assistants or instructors) or had a merit- or need-based scholarships and fellowships routinely benefited by having their tuition costs waived or paid for by the university as part of their support packages.

The difficulty that ensued from not billing tuition, waiving it, or charging it at a reduced rate was that the true cost of such financial aid became obscured. Also, the system of reduced tuition created unintended pedagogic outcomes as graduate students were often shifted among types of appointments (with different teaching and research duties) based solely on the financial impact of a lower tuition rate rather than the advisability of the assignment. Since the 1997-98 elimination of graduate reduced tuition, the university has moved to a system whereby tuition is recorded as a full and visible cost to the student and the payment of that cost is apparent in the financial-aid and accounting systems. Of the 4,313 students in the Graduate School in 2004-05 who were not registered *in absentia*, 75 percent received some form of support, whether administered by Cornell or awarded directly to the students by some externality, that helped pay their collective \$111.4 million tuition bill. As the graphs on page 26 demonstrate, the distribution of that support varied significantly by degree program.

- Only 4 percent of all tuition costs for doctoral students (\$2.8 million out of \$75.8 million) was paid by students personally.
- Students in terminal master's programs (M.A./M.S. degrees) provided 37 percent of their tuition costs (\$1.8 million out of \$4.7 million).
- Students pursuing professional master's degrees, such as the Master of Engineering, paid 79 percent of their tuition costs (\$23.1 million out of \$28.9 million).

Of the \$71 million of tuition support within the doctoral category that was provided from Cornell-administered resources, approximately \$11 million, or 15 percent, was charged to restricted grants and contracts. As a feature of the elimination of graduate reduced tuition described above, the university instituted, in 1997-98, a program whereby graduate tuition charged to external sources (primarily grants and contracts) would be matched, dollar for dollar, with an allocation of unrestricted funding. The impact of this program was to effectively maintain the net cost of graduate tuition to these sources during the transition from reduced tuition. The remaining \$60 million of graduate tuition support in 2004-05 came largely from the unrestricted budgets of the colleges and the university, although there are restricted gifts and endowments that support graduate education.

Stipends

In Cornell's formative years, the faculty consisted of professors of various ranks and a set of instructors and assistants. The instructors and assistants were often registered graduate students, pursuing advanced degrees while simultaneously teaching. As a formal system of graduate fellowships was created, the university attached work requirements, in the form of assistantship assignments, to these fellowships. Many graduate assistants worked outside of the classroom, helping to construct scientific apparatus, collect biological specimens, or analyze research data collected by faculty. Sometimes they published the results of their original research, individually or in tandem with their supervising faculty members, and they occasionally attended scientific meetings. Gradually, these assignments were codified into the two types of stipend support that are familiar today:

- *Fellowships*, which are designed to help the student with living expenses while enrolled in a degree program. A fellowship is a gift to the student, the award of which may be based on an assessment of need and/or merit. Fellowships carry prestige, and are used to attract high-caliber students. Fellowships are divided into two categories: (a) those

controlled and awarded by Cornell and (b) those controlled and awarded by an externality.

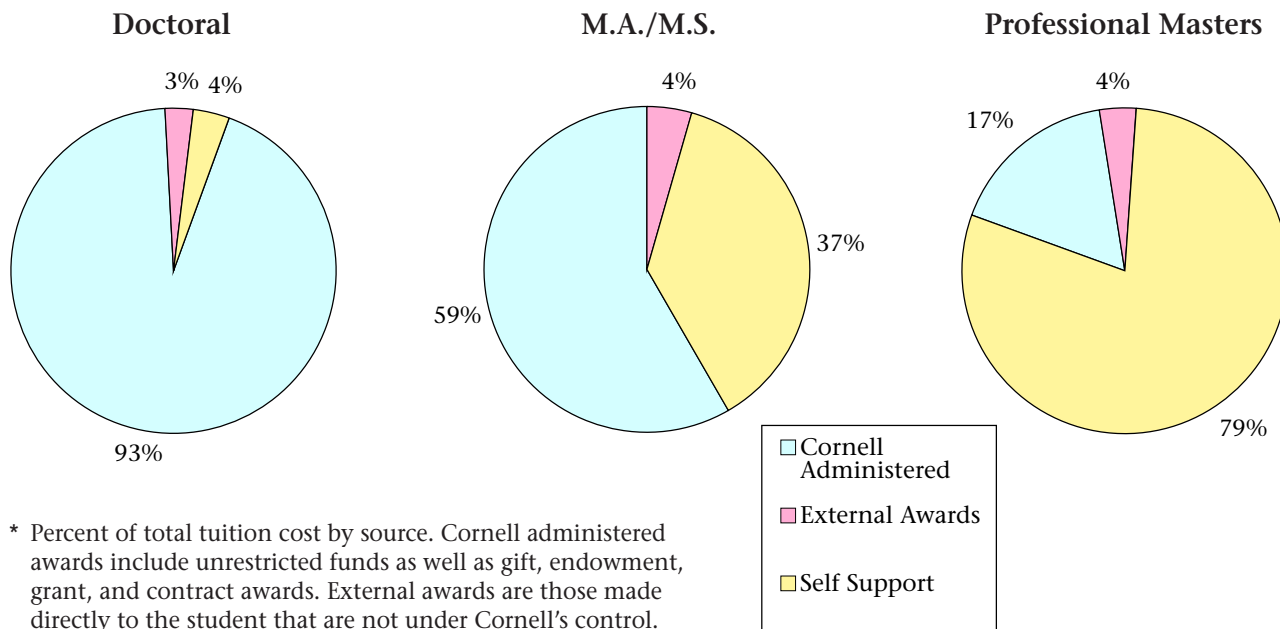
- *Assistantships*, which are payments for services rendered on a part-time basis that are also designed to help with living expenses. Assistantships are further divided into: (a) those in which the work performed is for someone else (teaching assistant or TA, research assistant or RA, graduate assistant or GA) and (b) those where the work performed is aimed at the student's own thesis (the graduate research assistant or GRA).

In the beginning, however, the distinction was less precise, as a fellowship holder was expected to teach. For example, in 1875, Andrew D. White recommended to the trustees

the establishment of fellowships on a basis of from \$8,000 to \$10,000 each, the interest to be appropriated to the maintenance of such students as may be recommended by vote of the Faculty based upon the proficiency and merit of the student candidates and that there shall be attached to each of the fellowships as the condition of holding it the requirement that the incumbent aid as a University instructor or examiner for an amount of time equivalent to at least six hours each week.

He offered this proposal because three years earlier the university floundered on the verge of bankruptcy and

Sources of Tuition Support* for Students in the Graduate School for 2004-05
(excludes students registered *in absentia*)



was saved by the pledge of \$155,000 made by White and four other trustees. White envisioned a time when these pledges could be converted into financial aid. In his 1883 report to the trustees, White argued that the crisis had been weathered and the time had arrived for the establishment of “a certain number of fellowships to which men of a high order of talent and genius in our graduating classes may be appointed, and which will enable them to pursue their studies as resident graduates.” The trustees acted, and in 1884 established a set of undergraduate scholarships and graduate fellowships to be named after Ezra Cornell, Hiram Sibley, Henry W. Sage, John McGraw, and Andrew D. White. The treatment of these initial forms of graduate support changed over the years.

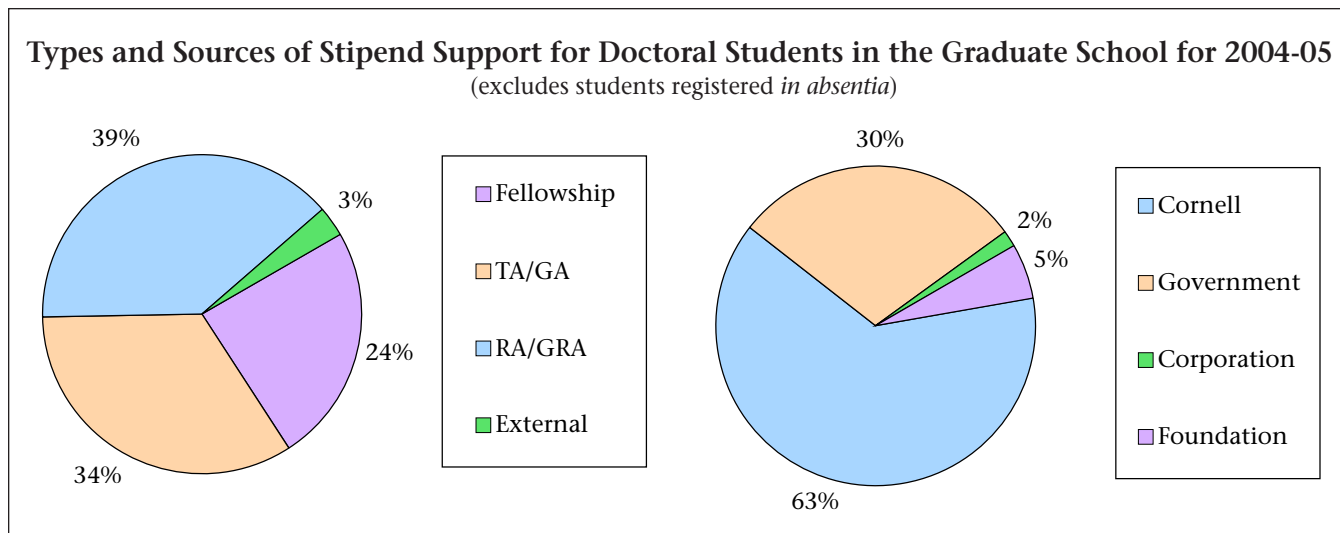
- The 1884 graduate fellowships,* of which there were seven initially, provided \$400 per year (approximately \$28,000 in current dollars).
- By 1900, the university was able to support about one-quarter of all graduate students registered for advanced degrees (41 out of 174) with fellowships drawn from college and departmental resources plus a few university-wide awards.
- In 1909, Professor of Plant Pathology Herbert H. Whetzel secured the university’s first industrial fellowships, with a grant from Niagara Sprayer Company. These grants funded graduate students to perform applied research that might directly benefit the sponsor, and opened the door to the system of externally supported graduate studies that blossomed after World War II.
- Unfortunately, Cornell did not regularly increase stipend levels, and by 1920 was still awarding \$400 stipends (worth about \$8,500 currently). In 1922, one-half of all graduate students held appointments as part-time instructors or assistants (265 out of 534), preferring these appointments to fellowships because of the higher stipend levels.
- In his 1932 report to the trustees, President Livingston Farrand noted that “cash stipends carried by fellowships and scholarships in the Graduate School compare quite unfavorably with those in

many of the other large universities of the country.” In that year, the Dean of the Graduate School estimated that the stipend rate would have to double just to catch up with those competitors. While unable to increase stipend levels, the trustees did respond by instituting 20 tuition-free scholarships to ease the burden of some students who were paying tuition from their stipend allowances.

- Finally, in 1934, the Graduate Faculty voted “to combine the stipends of certain scholarships with those of certain fellowships to make the stipends attached to the fellowships larger” to attract “a higher class of applicants.” The combined \$600 fellowship in 1937 had the same purchasing power as \$15,000 today, and the university had sufficient resources for about 58 such stipend awards. The trustees in turn increased the number of need-based, tuition-free scholarships to 30.
- In 1944, payout from a \$50,000 bequest from Allen Seymour Olmstead was assigned by the trustees to the Graduate School to endow two \$1,000-stipend scholarships,† which would be available to Ph.D. candidates in any field of study. As such, this fund constituted the first university-wide graduate scholarship program since 1884.
- By the end of World War II, the university had fellowship and scholarship support for about 170 students out of an enrollment of 1,000. And the trustees committed to provide free tuition for each of the permanently endowed scholarships and fellowships that were available. Even so, the Dean of the Graduate School continued to report, “Compared with other leading institutions, Cornell is desperately poor in this respect; our scholarly awards are relatively few, and the few we have to offer are as a rule stingy.”
- The post-war era brought several changes: (a) an increase in international students hoping to be awarded financial support, (b) a significant expansion in grant-funded graduate support, and (c) a more pronounced differentiation in stipend levels among fields. For example, in 1955-56, externally supported physical science stipends were twice as large as those in the humanities.
- By 1962, 10 percent of all graduate students were recipients of prestigious external fellowships, including awards from the National Science, Kellogg, and Rockefeller Foundations.

* Currently, the Graduate School awards 255 Sage fellowships, totaling over \$12 million, and 86 Cornell fellowships, totaling \$4.4 million, annually.

† Today, two stipend fellowships of about \$20,000 each are awarded annually from the Olmstead endowment.



- The last third of the twentieth century saw a substantial growth in grant and contract support for graduate students (primarily doctoral students paid from research projects) and an increase in gift and endowment funding for such students. Perhaps the most significant gift-funded graduate fellowship initiative of this era was the Olin Fellowship Program, which was established by the Spencer T. and Ann W. Olin Foundation in 1986 as part of a \$30 million, twenty-year commitment to support graduate education.
- More recently, the university observed that its minimum assistantship and fellowship stipend levels were falling behind those of key peer competitors. In 2003-04, Cornell began to make above-inflationary increases in those minima, with a growth of 10 percent planned for 2006-07.

For 2004-05, a total of \$52.3 million was paid in stipends from all sources to students in the Graduate School (excluding students registered *in absentia*), of which \$47.7 million went to doctoral students. TAs and GAs (who perform various duties, including the grading of papers) support the instructional mission of the institution. Besides helping in that endeavor, a teaching assistantship provides those students who plan to enter the educational enterprise with on-the-job experience. About one-third of all doctoral stipend support (\$16.2 million in 2004-05) came from TA/GA appointments. (See graph above at left.) RAs and GRAs, which accounted for about 40 percent of all doctoral stipend expenditures (\$18.5 million in 2004-05), primarily support Cornell's research mission,

providing those planning a career in research with the tools, materials, environment, and mentoring needed to undertake advanced training. Internal and external fellowships accounted for the remaining 27 percent.

Fellowships and assistantships are often paid from the same sources that provide tuition support for graduate students, although not in the same proportion. The tuition-matching program mentioned above for grants and contracts does not extend to stipends. Thus, while government agencies (primarily federal) fund about 30 percent of all doctoral stipend support, they provide only about 15 percent of the corresponding tuition support. (See graph above at right.)

Health Insurance

Cornell has, for many years, provided undergraduate and graduate students with access to a group health insurance program. Participation was mandatory, but students could waive membership if they could offer proof of comparable external coverage. An audit of this external coverage for graduate students revealed an unacceptably high level of inadequate and incomplete coverage. To address this problem the university instituted a program in 2001-02 whereby Cornell pays for the student health insurance premium for all graduate students registered through the Graduate School who receive full tuition and stipend support from or through Cornell. Graduate students not receiving support at that level are responsible personally for the cost of health insurance, and may appeal that cost by demonstrating adequate coverage.

CHALLENGES

Graduate and professional education faces many challenges today. Some issues are national or global while others are Cornell-specific.

Under/Over Production

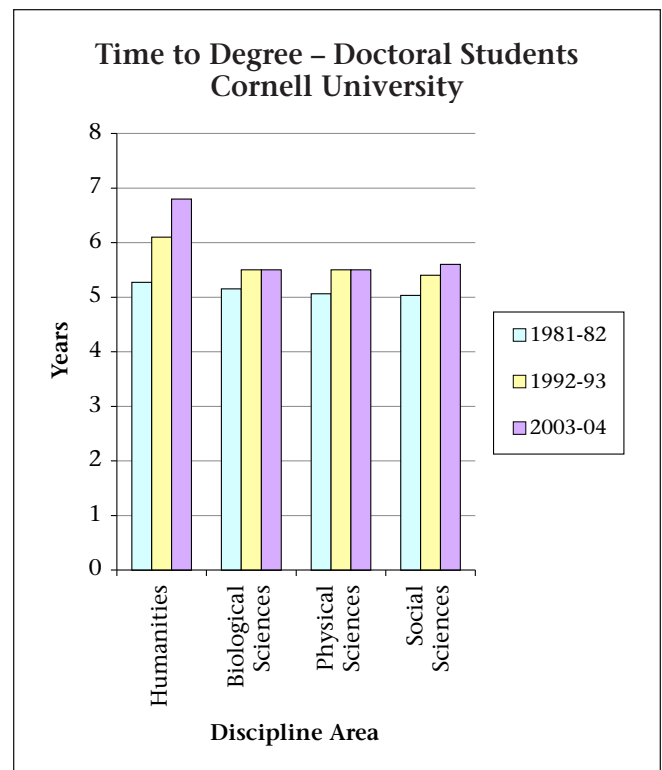
Concerns of under/over production of advanced degrees *en masse* and in some fields have been expressed since the beginning of the twentieth century. Everett Walters reported that Edwin E. Slosson (May Preston Slosson's son) criticized the "booming popularity of the Ph.D. ...that it was being imperiled by its popularity, that its financial value was becoming too great, and that too many people now came to measure an institution's stature by the Ph.D.'s on its faculty roster," observations which he made in 1909-10. A 1957 U.S. presidential commission on education noted a looming crisis in Ph.D. production, with estimates of 15,000 to 25,000 Ph.D.s needed annually in the 1960's versus a production capacity of 9,000 nationally. In reality, U.S. production of doctoral degrees jumped from 9,829 in 1959-60 to 29,866 in 1969-70, responding well to the perceived "crisis." In 2002-03, U.S. higher education conferred 46,024 doctoral degrees along with 512,645 masters and 80,810 first-professional degrees, for a combined total of 639,479 advanced degrees—the greatest annual production in the nation's history. Among the many factors influencing a continued strong interest in advanced degrees is the substantial economic advantage they provide the degree holders. Andreas Schleicher, in a policy brief prepared for the Lisbon Council of the European Union, noted that in industrialized nations workers with advanced degrees earn between 1.5 and 2.5 times more than workers with secondary educations. (The advantage in the U.S. is 2.0 times, according to this study.)

At Cornell, individual graduate fields (especially in the humanities) have sometimes instituted caps on graduate enrollment where there appeared to be limited employment potential in traditional faculty positions. And while market pressures cause enrollments to wax and wane in great cycles for some disciplines (especially in professional programs such as law, business, medicine, and engineering), the general trend is for a gradual increase in graduate enrollments at Cornell and elsewhere. (See graph on page 14.)

Length of Time to Degree

A second concern is the length of time to degree. Alvin Kwiram has described this as a national problem, both in terms of the gradual lengthening of the time over the past 30 years and the disparity in this respect between the U.S. and Europe. "For example, students in the United Kingdom are expected to complete their Ph.D. studies in three years." An analysis of the median time to degree from baccalaureate to doctorate for registered students conducted by Allen R. Sander-son, et al. showed a general increase from 6.0 years in 1974 to 7.3 years by 1999, with the field of humanities experiencing a change from 6.7 to 8.9 years.

Cornell has seen similar growth over the same period, although the university's elapsed times are lower. (See graph below.) The 6.8-year average time to degree in the humanities generally reflects the tight job market for such Ph.D. recipients. Anecdotal evidence suggests that students and faculty believe that the quality of research and the thesis (as the most visible product of education in the humanities) must be superior for students to compete for the limited set of desirable jobs, the effect of which is to increase the level of research and the time spent writing, editing, and polishing.



Sources and Types of Support

The Cornell Graduate and Professional Student Assembly conducted a survey of all graduate and professional students on the Ithaca campus in 2005. Students reported the following as “areas in need of improvement” (in order of priority): stipends, health insurance, dental insurance, and housing. While Cornell has made positive gains in recent years in increasing stipend levels, providing health insurance, and offering on-campus housing, there is clearly room for improvement. Peer research universities are making substantial investments in these types of support, and Cornell must remain proactive in addressing these issues if it is to remain competitive in attracting the best student scholars. The university’s substantial reliance on unrestricted resources for tuition fellowships, stipend support, and health insurance payments serves to limit Cornell’s ability to respond to students’ needs and external pressures. It is to address these needs that Cornell is placing added emphasis on fundraising for graduate support in its upcoming capital campaign.

STEWARDS OF THE DISCIPLINE

By almost any measure, Cornell’s graduate and professional programs are highly ranked, nationally and internationally. The university grants a little under one percent of the doctoral degrees awarded nationally (411 out of 46,024 in 2002-03). The National Research Council (NRC) conducts the most prestigious analysis of graduate programs. Its most recent study (1995) examined more than 3,600 programs at 270 institutions in 41 fields of doctoral study, collecting two types of information: “descriptive statistics of selected characteristics of research-doctorate programs (such as the number of faculty and students), and the views of faculty ‘peers’ relative to program quality.” The study depended heavily on subjective measures of reputation, solicited from more than 8,000 graduate faculty at peer institutions. When “the judgments of numerous individual raters are pooled, there tends to be strong agreement about which programs are the strongest and which are the weakest; there is considerably less agreement about the programs in the middle range.” As might be expected at an institution as heterogeneous as Cornell, the study’s slotting of individual programs varied greatly. (See table above at

**Faculty Ratings of Cornell University Programs
National Research Council (1995)**

	Rank Order	Number Ranked	Overlap Group *
Aerospace Engineering	6	33	1/5
Anthropology	31	69	16/7
Art History	23	38	3/4
Astrophysics & Astronomy	9	33	2/0
Biochem. & Molecular Bio.	22	194	8/11
Cell & Developmental Bio.	35	179	15/22
Chemical Engineering	13	93	3/4
Chemistry	6	168	0/6
Civil Engineering	6	86	3/1
Classics	12	29	5/2
Comparative Literature	6	44	4/4
Computer Sciences	5	108	1/0
Ecology, Evol. & Behavior	4	129	3/5
Economics	18	107	2/5
Electrical Engineering	7	126	2/0
English Language & Lit.	7	127	3/4
French Language & Lit.	8	45	2/2
Geosciences	10	100	6/8
German Language & Lit.	3	32	2/2
History	13	111	4/0
Linguistics	9	41	3/4
Materials Science	3	65	1/5
Mathematics	15	139	6/10
Mechanical Engineering	7	110	3/5
Molec. & General Genetics	23	103	6/7
Music	12	65	7/6
Neurosciences	24	102	8/19
Pharmacology	49	127	31/49
Philosophy	9	72	2/3
Physics	6	147	5/2
Physiology	31	140	18/29
Political Science	15	98	5/2
Psychology	14	185	6/11
Sociology	35	95	13/7
Spanish Language & Lit.	8	54	6/7
Statistics & Biostatistics	4	65	1/3

* The number of institutions above and below Cornell that were not statistically different from Cornell’s rank.

right.) The NRC is preparing an update to this assessment, which it expects to release shortly.

Information on the quality of professional programs comes from a variety of sources, including internal and external self studies, faculty tenure and promotion reviews, student and alumni satisfaction surveys, and popular press articles. The just-released U.S. News & World Report national rankings of graduate schools listed the Johnson School at 16th, the Law School at 13th, and the Medical College at 15th.

The university's graduate program is large, but it achieves success through the intense localization of the special committee structure that crafts a unique educational path for each doctoral student and marries that to the research and scholarly interests of a small group of faculty. Cornell's professional schools, while providing more of a uniform educational experience for their students, achieve a similar level of excellence by remaining relatively small—which facilitates access to faculty mentors, a strong sense of community, a responsive environment for creative innovation, and an emphasis on practical ethics.

Clark Kerr observed that universities are

one of two sets of human institutions most impervious to change—the guilds of the professors and the orders of the priests. ...About seventy-five institutions in the Western world established by 1520 still exist in recognizable forms, with similar functions and with unbroken histories, including the Catholic church; the Parliaments of the Isle of Man, of Iceland, and of Great Britain; the governance structures of several Swiss cantons; the Bank of Siena; and some sixty-one universities. ...Kings that rule, feudal lords with vassals, and guilds with local monopolies are all gone. ...The sixty-one universities, however, are mostly still in the same locations with some of the same buildings, with professors and students doing much the same things, and with governance carried on in much the same ways. There have been many intervening variations on the ancient themes...but the eternal themes of teaching, scholarship, and service, in one combination or another, continue. Looked at from within, universities have changed enormously in the emphases on their several functions and in their guiding spirits, but looked at from without and comparatively, they are among the least changed of all institutions.

Interestingly, many of the nineteenth century concepts used to define and support graduate education at Cornell and elsewhere remain in place in the twenty-first century. In Kerr's sense, graduate schools are medieval institutions—havens of the priesthood wherein students undergo a trial by fire that is highly customized and fitted to the individual. Professional schools, among their many other merits, serve to normalize and standardize in a reproducible and certifiable manner older systems of apprenticeship. Faculty in graduate and professional schools are practitioners who impart their collective craft: doctors teaching future doctors, lawyers teaching future lawyers, architects teaching future architects, professors teaching future professors. Unlike professional schools, however, most graduate schools, including Cornell's, are orthogonal constructs, situated in a different organizational plane

from undergraduate colleges and professional schools. In his first report as Dean (in 1910), Ernest Merritt noted that the Graduate School at Cornell was

not to be regarded as a federation of colleges or departments, but as an association of individuals having equal rights and privileges in respect to graduate work.

A recently published review of doctoral education edited by Chris M. Golde and George E. Walker argues that the purpose of doctoral education

taken broadly, is to educate and prepare those to whom we can entrust the vigor, quality, and integrity of the field. This person is a scholar first and foremost, in the fullest sense of the term—someone who will creatively generate new knowledge, critically conserve valuable and useful ideas, and responsibly transform those understandings through writing, teaching, and application. We call such a person a “steward of the discipline.”

Producing such stewards requires a system of education that recognizes these three aspects:

The Ph.D., at its heart, is a research degree. Demonstrating the ability to conduct research and scholarship that make a unique contribution and meet the standards of credible work is the culminating experience of the Ph.D.

Stewards have responsibility for maintaining the continuity, stability, and vitality of the field.

Knowledge, understanding, and insight have little meaning by themselves. ...transformation speaks of the importance of representing and communicating ideas effectively and clearly...in the broadest sense.

Cornell faces interesting issues in graduate education:

- The soon-to-be-released National Research Council analysis of the nation's research/doctorate programs will trigger an internal reassessment of those programs at Cornell by the university's faculty and academic leadership.
- The system of graduate fields of study undergoes constant evolution as new disciplines are created and existing fields become more interdisciplinary.
- Graduate stipend levels are growing more rapidly than inflation, and there is a need to increase the overall level of graduate support in order to remain competitive.
- The university needs to develop a more rational approach to graduate tuition, one that is conducive to the increasingly interdisciplinary nature of research and scholarship at Cornell. The educational costs of graduate education are generally greater than those for undergraduates, and the need for tuition fellowship support is significant.

Yet despite these challenges, or perhaps because of them, Cornell remains true to the spirit embodied in the phrase “stewards of the discipline,” committed to providing advanced education to a large, diverse, and intellectually impressive cohort of student scholars.

BIBLIOGRAPHY

- Arizona State University, *ASU Focuses on Outcome-Determined Excellence* [Online source] <http://www.asu.edu/president/newamericanuniversity/arizona/newgoldstandard.html>
- Bishop, Morris, *A History of Cornell*. Ithaca, NY: Cornell University Press, 1962.
- Carmichael, Oliver C., *Graduate Education: A Critique and a Program*. New York, NY: Harper & Brothers, 1961.
- Carnegie, Andrew, *Autobiography of Andrew Carnegie*. Boston, MA: Houghton Mifflin, 1920.
- Carnegie, Andrew, *Wealth*, [In] *North American Review*. New York, NY: A. T. Rice, June 1889.
- Carnegie Foundation for the Advancement of Teaching, *100 Years of the Carnegie Foundation* [Online source] <http://www.carnegiefoundation.org/centennial/index.asp>
- Carnegie Foundation for the Advancement of Teaching, *The Carnegie Classification of Institutions of Higher Education* [Online source] <http://www.carnegiefoundation.org/classifications/>
- Carnegie Foundation for the Advancement of Teaching, *The Carnegie Classification of Institutions of Higher Education, A Technical Report*. New York, NY: The Carnegie Foundation for the Advancement of Teaching, 2000.
- Carnegie Foundation for the Advancement of Teaching, *The Study of Legal Education, Recommendations of the American Bar Association*. New York, NY: The Carnegie Foundation for the Advancement of Teaching, 1921.
- Chaucer, Geoffrey, *Canterbury Tales, Rendered into Modern English* by J.U. Nicolson. Garden City, NY: Garden City Publishing Co., Inc., 1934.
- Chronicle of Higher Education, Nov. 18, 2005, *Raising Arizona, Is Michael Crow's Remaking of a State University a Model, or a Mirage?*, Washington, DC.
- Conable, Charlotte W., *Women at Cornell, The Myth of Equal Education*. Ithaca, NY: Cornell University Press, 1977.
- Cordasco, Francesco, “Gross, Samuel David” American National Biography Online. [Online source] <http://www.anb.org/articles/12/12-00354.html>
- Cornell University, *Annual Report of the President*. Ithaca, NY: Cornell University, 1881-1950.
- Cornell University, *The Cornell University Register, [various years]*. Ithaca, NY: Cornell University.
- Cornell University, *Juris Doctor Degree Program, General and Application Information for Fall 2006*. [Online source] <http://www.lawschool.cornell.edu/admissions/view-books/pdfs/JDAppBrochure.pdf>
- Cornell University, *Trustee Minutes and Miscellaneous Papers of the Board of Trustees*. Ithaca, NY: Cornell University, 1865-2006. [Some private]
- Duffy, John, *From Humors to Medical Science, A History of American Medicine*. Urbana, IL: University of Illinois Press, 1993.
- Flexner, Abraham, *Medical Education in the United States and Canada*. New York, NY: The Carnegie Foundation for the Advancement of Teaching, 1910.
- Golde, Chris M. and George E. Walker, editors, *Envisioning the Future of Doctoral Education*. San Francisco, CA: Jossey-Bass, 2006.
- Gossel, Patricia P., “Salmon, Daniel Elmer” American National Biography Online. [Online source] <http://www.anb.org/articles/12/12-00812.html>
- Gross, Samuel D., *Autobiography of Samuel D. Gross, M.D.* Philadelphia, PA: George Barrie, 1887.
- Hazzard, Florence W., *Interview with May Preston Slosson*. Ithaca, NY: Cornell University Library.
- Hewett, Waterman T., *Cornell University, A History*. New York, NY: The University Publishing Society, 1905.
- Horowitz, Helen L., *The Power and Passion of M. Carey Thomas*. New York, NY: Alfred A. Knopf, 1994.
- Josephson, Matthew, *The Robber Barons, The Great American Capitalists, 1861-1901*. New York, NY: Harcourt, Brace & World, 1934.
- Kerr, Clark, *Higher Education Cannot Escape History, Issues for the Twenty-first Century*. Albany, NY: State University of New York Press, 1994.
- Kwiram, Alvin L., *Time for Reform?* [In] *Envisioning the Future of Doctoral Education*. San Francisco, CA: Jossey-Bass, 2006.
- Literary Digest, Aug. 30, 1919, *Andrew Carnegie, Pioneer in Two Fields*. New York, NY: Funk & Wagnalls.
- Manly, John M. & Edith Rickert, *The Text of The Canterbury Tales*. Chicago, IL: University of Chicago Press, 1940.
- McPherson, James M., “Lincoln, Abraham” American National Biography Online. [Online source] <http://www.anb.org/articles/04/04-00631.html>
- Rawlings, Hunter R., *1998 State of the University Address* [Online source] <http://www.news.cornell.edu/campus/stateofuniv98.html>
- Rudolph, Frederick, *Curriculum, A History of the American Undergraduate Course of Study Since 1636*. San Francisco, CA: Jossey-Bass Publishers, 1978.
- Sandburg, Carl, *Abraham Lincoln, The Prairie Years*. New York, NY: Harcourt, Brace & World, Inc., 1926.
- Sanderson, Allen R., et al., *Doctorate Recipients from United States Universities: Summary Report 1999*. Chicago, IL: National Opinion Research Center at the University of Chicago, 2000.
- Schleicher, Andreas, *The Economics of Knowledge: Why Education Is Key for Europe's Success*. Brussels, Belgium: The Lisbon Council, 2006.
- Slosson, Preston W., *A Teacher's Report Card*. Ann Arbor, MI: George Wahr, 1975.
- U.S. Department of Education, NCES, *Digest of Educational Statistics, 2004* [Online source] <http://www.nces.ed.gov/programs/digest/d04/>
- Wall, Joseph F., *Andrew Carnegie*. New York, NY: Oxford University Press, 1970.
- Thwing, Charles F., *A History of Education in the United States Since the Civil War*. Boston, MA: Houghton Mifflin Company, 1910.
- Walters, Everett, *Graduate Education Today*. Washington, DC: American Council on Education, 1965.
- White, Andrew D., *Autobiography of Andrew Dickson White*, New York, NY: The Century Co., 1905.