In this crowded Manhattan classroom, students watch their teacher. Pupil-teacher ratios declined throughout the century. Photograph taken by Jacob Riis circa 1886. Courtesy of Corbis-Bettmann.
Few American adolescents completed high school in 1900, and only one in fifty finished college. By the end of the century, more than 80 percent of adults had completed high school and a quarter of the adult population had graduated from college.

The annual number of male college graduates increased more than fivefold from 1946 to 1950, when millions of veterans took advantage of the G.I. Bill of Rights to go to college. Another steep rise was associated with the educational deferments available during the Vietnam War.

These trends represented a massive upgrading of the nation’s human resources—one that enabled and sustained technological progress, the expansion of knowledge in every field, the continuing shift from blue-collar to white-collar occupations, and the adjustment to an increasingly complex social environment.

The chart refers to all adults aged twenty-five or older, but the educational attainment of those aged twenty-five to thirty-four was even higher. In 1998, 88 percent of this younger group had graduated from high school, and 28 percent had completed four or more years of college.
Educational Attainment
Percentage of population aged 25 and older

High school graduate or higher

College graduate or higher

1910 = 3%
1998 = 83%
1910 = 13%
1998 = 24%
Women's share of bachelor's and advanced degrees trended upward throughout much of the century.

Women predominated among high school graduates in 1900, earning 60 percent of the diplomas issued that year. Men were less likely to graduate from high school because so many of them entered the full-time labor force before or during their early teens. As the chart at the upper left indicates, the proportion of high school diplomas awarded to women declined to about half by the end of the century. While women received a majority of high school diplomas in 1900, post-secondary education was still reserved primarily for men. Women earned only 19 percent of bachelor's degrees in 1900, but their share doubled to 40 percent by 1930 and remained at about that level in 1940. After World War II, however, the female share of bachelor's degrees dropped sharply as male veterans flooded into colleges and universities under the G.I. Bill. Not until 1970 did women's share of college degrees surpass the pre-World War II level. After 1970, however, women's percentage of college degrees rose briskly, reaching parity in the early 1980s. As the chart at the upper right indicates, women received more than half of all bachelor's and first professional degrees by 1990.

The chart at the lower left shows the female proportion of master's and first professional degrees. This includes not only the academic master's degrees but also the major professional degrees such as M.D., D.D.S., M.B.A., and J.D. As with bachelor's degrees, the female share was depressed as a result of the G.I. Bill, but by 1990, women received a majority of these degrees as well. In 1996, women received 56 percent of master's degrees in education, 41 percent of medical degrees, 44 percent of law degrees, and 38 percent of business management degrees.

The trend for academic doctorates was parallel, but women still constituted a minority of recipients at the end of the century. The doctoral degrees shown in the chart at the lower right are all academic, such as the Ph.D. in English. Women were awarded only 6 percent of all doctorates in 1900. This proportion peaked at 15 percent in 1930, then fell and remained below that level for more than forty years. After 1970, women earned a steadily larger share of doctorates, but men still predominated in most fields of advanced study.

Although women's share of college and advanced degrees dipped in midcentury, the number of women earning degrees at each level increased from decade to decade without interruption.
Gender Balance of Graduates
Female recipients as percentage of each group

High School Diplomas
Parity line 1900 = 60%
1997 = 51%

Bachelor's Degrees
Parity line 2000 = 56%

Master's Degrees
Parity line 2000 = 55%

Academic Doctorates
Parity line 2000 = 41%

Education 55
The pupil-teacher ratio in the nation’s public elementary and secondary schools declined by nearly half during the century.

In 1910, a teacher in a public elementary school taught a class of thirty-four pupils, on average. By 1998, each teacher had only nineteen pupils. The reduction in the pupil-teacher ratio was even greater in the high schools, where the average class declined from twenty-eight students in 1910 to fifteen students in 1998. The spread of special education classes, which are relatively small, contributed to the decline in the pupil-teacher ratio. Despite some reversals in this trend during the baby boom years and in particular localities, the overall movement toward smaller classes was unmistakable.

During the early part of the century, when the U.S. public school system was complacently regarded as the best in the world, pupil-teacher ratios were much less favorable than in the last decades of the twentieth century, when criticism of the same public schools was widespread. Perhaps the most authoritative survey of the educational performance of the public schools was *A Nation at Risk*, the 1983 report of the National Commission on Excellence in Education.

During the latter decades of the century, studies of the relationship between class size and student achievement were inconclusive. But reductions in class size may be desirable nonetheless. Because cultural changes, judicial decisions, and administrative policies curtailed their personal authority, teachers at the end of the century may have had more difficulty managing fifteen pupils than their predecessors had controlling and holding the attention of twice that number.
Pupil-Teacher Ratio in Public Schools

Number of pupils per teacher

<table>
<thead>
<tr>
<th>Year</th>
<th>Elementary</th>
<th>Secondary</th>
</tr>
</thead>
<tbody>
<tr>
<td>1910</td>
<td>34</td>
<td>28</td>
</tr>
<tr>
<td>1955</td>
<td>30</td>
<td>21</td>
</tr>
<tr>
<td>1998</td>
<td>19</td>
<td>15</td>
</tr>
</tbody>
</table>
The traditional starting age for American elementary school children is six years. Kindergartens add an extra year of more or less formal schooling, beginning at age five. The concept and name of this extra year were imported from Germany, where the original kindergartens enrolled children at age four.

Most kindergartens are operated in conjunction with an elementary school where pupils go directly into the first grade. While enrollment in the first grade is legally compulsory, enrollment in kindergarten is usually optional, although school systems may strongly encourage parents to take that option.

Most nursery schools accept toilet-trained children at age three or older, although the distinction between preschools and day-care centers that accept even younger children is not always clear.

The majority of nursery schools are privately owned and operated, some for profit and some not. Until the latter decades of the century, most were small and informal, but the vast increase in the number of working mothers, together with the advent of the Head Start program and federal day care subsidies in the 1960s, enlarged and formalized many nursery schools.

Before 1965, enrollment in preschools never exceeded 10 percent of the total population of children aged three and four. But more than a third of that young population were enrolled by 1980 and more than half were enrolled in 1997, on schedules ranging from two or three hours once or twice a week to full-time attendance.
Enrollment in private elementary and secondary schools peaked in 1960 and then declined through 1990, when enrollment began to increase again.

By 1900, every sizable city in the United States had private as well as public elementary and high schools. Although private schools attracted a relatively small share of the school-age population, they provided an important alternative to the public schools for diverse segments of the population. The peak years for private schooling in America occurred in the wake of the Supreme Court’s 1954 decision mandating desegregation of public schools. Hundreds of school districts in the South essentially shut down rather than integrate. White children attended hastily arranged private “academies.” This “massive resistance” began to diminish after 1965. Changes in laws affecting the racial composition of public schools also bolstered private school attendance outside of the South.

For affluent families, a small number of expensive boarding schools provided a unique kind of adolescent life and privileged access to selective colleges. Most of these boarding schools were founded under religious auspices for either boys or girls. By the end of the century, however, nearly all of them were coeducational, less religious, and active in recruiting nonaffluent, especially minority, students. Originally, some of them offered six or seven years of instruction, but a four-year course became standard.

Another group of boarding schools was designed for students with special interests or problems. These include private military academies and private residential schools for students with behavior problems and learning or physical disabilities.

All large cities and suburban areas had a few private day schools that offered the same advantages as expensive boarding schools, but in a nonresidential setting. Providing education from kindergarten through high school to students from affluent families, many of these schools retained their single-sex character.

The largest category of private day schools operated under religious auspices and inculcated both religious and secular teachings. Besides Catholic schools, by far the most numerous, this group comprised Christian (Protestant fundamentalist), Jewish, Adventist, and Quaker schools, among others.

As recently as 1970, the pupil-teacher ratio in private elementary schools was twenty-seven students per teacher. By 1998, the pupil-teacher ratio was only sixteen students per teacher. The comparable figures for public elementary schools were twenty-four pupils per teacher in 1970 and nineteen pupils per teacher in 1998. By then, public elementary schools had lost the advantage in class size that they enjoyed in 1970. For various reasons, however, average per pupil expenditures were lower in private schools than in public schools.
Private School Enrollment
Students in private school as percentage of all students

1900 = 16.7%
1900 = 6.8%
1997 = 9.6%
1997 = 7.6%

Elementary school
High school
Tuition at Harvard, measured in constant dollars, nearly quadrupled during the first seventy to eighty years of the century, then doubled during the last two decades alone. The chart shows the trend in tuition only. When dormitory charges, meals, books, and incidental expenses are added, the total bill for a year at Harvard in 1997 came close to the median after-tax family income.

Some other private colleges were even more expensive. Public colleges had considerably lower tuition rates, but their charges also escalated sharply during the last two decades of the century, outpacing inflation from year to year.

Although tuition and fees accounted for less than a fifth of the budgets of public institutions and less than half of the budgets of private institutions, they were much more amenable to institutional control than other sources of income such as government grants and private gifts.

The recent rise in the cost of operating a college or university can be attributed to a number of factors: (1) unpredictable fluctuations in the distribution of student choices among fields of study; (2) a dramatic increase in the regulatory and reporting requirements imposed by government agencies; (3) competition from Medicaid and prison-building programs for state support; (4) the continuing exponential expansion of scholarly knowledge; and (5) the successive addition of mainframe computers, minicomputers, and personal computers to the equipment needs of libraries, classrooms, and offices.

These rising costs were met in large part by increases in tuition and fees. A complex system of scholarships, part-time employment, parental loans, and subsidized and unsubsidized student loans filled the gap between what colleges charge and what students and their families can afford to pay.
Harvard College Tuition
Constant 1999 dollars per year

1900 = $3,000

1999 = $22,054
Graduate education programs proliferated in virtually every profession. In the nineteenth century, business proprietors managed their own enterprises with a small staff of clerks and managers. By the closing decades of the twentieth century, many corporate management jobs required a degree from a graduate business school.

In many fields, professional credentials became synonymous with graduate degrees: dentists needed a D.D.S.; veterinarians needed a D.V.M.; lawyers needed a J.D. In fields where beginning practitioners required only a bachelor’s degree, professional advancement often hinged on acquiring graduate education. Architects added an M.Arch. to their B.Arch. Teachers added an M.Ed. to their bachelor’s degree. Computer programmers went back to school for an M.S. in computer science. Military officers traditionally received bachelor’s degrees in engineering, but after World War II, they went to graduate school while on active duty, acquiring master’s and doctoral degrees in various fields. Indeed, whole academic fields were created to meet the needs of professions for graduate degrees: “national security studies” for military officers and “international relations” for State Department bureaucrats.

The desire for graduate degrees also permeated fields of endeavor whose practitioners scorn bureaucracy as such—art, music, and creative writing, for example. Aspiring artists and writers pursued M.F.A.’s, while musicians often got M.M.’s.

The top of the academic food chain, the Ph.D., was reserved for most of the century for academic subjects. Even this changed as the Ph.D. became a job credential outside the academy. Economists sometimes needed Ph.D.’s to work for banks. Physicists sometimes needed Ph.D.’s to work for telephone companies. A president of the Modern Language Association suggested that the solution to a glut of English Ph.D.’s was to redesign the degree so that it would become the professional credential for screenplay writing, magazine editing, and other language-related occupations.

Still, American graduate education is the envy of the world and one of America’s most successful exports. At the end of the century, foreign students received 40 percent of doctorates in biology, 50 percent of doctorates in physics and chemistry, 55 percent of doctorates in mathematics, and 60 percent of doctorates in engineering.
Graduate Degrees Conferred
Thousands of each type of degree per year

Master's Degrees
1900 = 1,583
1999 = 410,000

Major Professional Degrees
(M.D., D.D.S., J.D., D.V.M., etc.)
1961 = 25,253
1999 = 75,800

Academic Doctorates
1900 = 382
1999 = 45,800