

## ARTICLE

# From Gentlemen to Technologists:

“Who Went to College?” in the United States, 1800-1890

Yo TABAYASHI

### Abstract

Higher education currently attracts much attention concerning its curriculum, its student body, or its finances in many countries. However, these issues have long been of concern as well since 1820s. This paper focuses the first two issues in nineteenth-century America. During this period, old colleges such as Harvard, Yale, and Columbia faced tremendous changes while many institutions, including newly established state universities, were opening scientific, agricultural, and mechanical-arts schools. The purpose of this paper is primarily to describe changes in higher education and contemporary society during this period. Drawing on data from the census, historical statistics, and old documents of 1800 to 1890, it attempts to clarify “what kind of youth” studied “what subjects” “for what purpose” in colleges. The findings of our research demonstrate that a very small proportion of white males studied liberal arts to be “remembered” as “gentlemen” in 1800, while a much larger number of mixed youth studied a variety of newly-developing disciplines, including agriculture and engineering, in order to be “useful” as “technologists” in the expanding American society. This paper also suggests that the substantial shift from gentlemen to technologists may be understood in terms of the two conflicting ideas of equity/democracy and excellence/reason, each of which has been demanded, utilized, and debated in higher education institutions over the course of history.

### Introduction

Cooper Union in New York, NY, is on the verge of charging tuition to students. It may sound surprising to those who are unfamiliar with the school that the high-ranking and extremely competitive New York City college has been providing free education since its foundation in 1859. However, due to the financial difficulty, the administration has started discussing whether they should charge undergraduate tuition (Perez-Pena, 2011). This is only an outstanding example among many topics concerning higher education. Higher education attracts more and more attention in many countries these days. Especially in advanced nations, where the population

of the traditional college-student-age group cannot be expected to increase, higher education is called a “matured industry” with little prospect to develop in the future. Among these countries, the United States of America and Japan share some similar problems. Many institutions of higher education are getting to depend on incoming international students, and thus to make changes for these students in their curriculum in each department. Prime challenges we are currently facing are epitomized in the following three questions: “Who goes,” “Who pays,” and “What should be taught?”<sup>1</sup> These questions concern the composition of students, financial support, and the adopted curriculum in higher educational institutions.

This paper focuses on the history of higher education in the latter half of nineteenth century America. During this period, old institutions faced tremendous changes while new institutions were born. For example, old traditional colleges such as Harvard, Yale, and Columbia were in the process of changing themselves into big national universities, while many institutions, including newly established state universities, were opening scientific, agricultural, and mechanical arts schools. These changes have been discussed in a plethora of historical studies so far<sup>2</sup>. However, to my knowledge, there is not much concentration of study on the changes in the broader context of social history. Why, at that point of time, did American colleges go through such transformations? What factors outside education affected the changes?

This paper will not try to make a specific argument on higher education. Rather, it will attempt to describe the radical shift in curriculum and student body in higher education from 1800 to 1890. We will focus, in particular, on the period from 1850, when the old system of higher education was barely surviving and the new system was introduced, to 1890, when the American frontier was diminished, industrial structure was transformed, and higher education was getting conspicuously institutionalized all over the country. In order to assess the degree of change in this period (forty years), we will compare the conditions of this particular higher education with the decades of 1790-1800, as well as give a brief look at the history of demographic and institutional changes over the entire nineteenth century.

Focusing specifically on this period of the United States would be useful in two ways. One concerns the particularity of American higher education. The United States has a much shorter history than many other advanced countries. This means we can see a condensed history of a rapidly evolving society as Alexei de Tocqueville pointed out as early as the late 1830s, in *Democracy in America*. Of course, the history of higher education is also shorter than that of Europe which started in the medieval ages. From this vantage point, we are able to see the evolution of the changes with more explicit records, from the very beginning, than those of Europe. The second, in contrast, regards the commonality among nations. In the early nineteenth century, Germany succeeded in revitalizing universities in the name of nation-building by founding national universities with a fixed curriculum (Yoshimi, 2011, pp. 78-80); other universities in Europe

followed. Later in the 1870s, newly-opened and rapidly modernizing Japan established the Ministry of Education and regulated laws for schools including newly founded national universities<sup>3</sup>. The fact that the Bureau of Education in the United States was founded at almost the same time in 1866, shows that these two nations with distinct histories were synchronizing the processes of modernization and the institutionalization of education. Concentrating on this period in the US might suggest some characteristics modernizing nations had in common.

This paper consists of three sections. My first section describes the general background *surrounding* higher education in 1790-1800, because the first census was done in 1790; data collected in previous researches was usually after 1800. My next section portrays significant changes in students, curricula, and purposes of higher education from 1800 to 1890, specifically focusing between 1850 and 1890, the period during which drastic changes happened. My last section strives to address for whom higher education existed and to suggest how the changes were driven back and forth in the equity/democracy and excellence/reason spectrum.

## **1. Higher Education and Its Background in 1790-1800**

The United States of America started as a newly independent nation with its original thirteen states in 1776. However, it took some time for the government to realize what this nation was like. The first census in 1790 showed a population of 3,929,214, and population per square mile of land was 4.5. Further information, however, is very limited in this fifty-five page long report (U.S. Census Bureau, n.d.a) because the new government had not good enough earlier records, nor were there established methods for statistics and statistical analysis in general at that time. We can only assume that the total valuation of national wealth was 2,505.5 million dollars as of 1805 (The Bureau of Census, 1949, p. 1, Table 1)<sup>4</sup>.

Having mentioned this inevitable lack of information, it may still be helpful for us to look over, in this section, contemporary situations concerning colleges.

### **1.1. "Who Went Where?": Students in Colleges**

Colin B. Burke (1982) shows interesting statistics about colleges in the nineteenth century. He delineates contemporary colleges, students, and their occupations after graduation in many tables<sup>5</sup>. Since our discussion, hereafter, owes a great deal to this work, let us start with his grouping of regions. Burke categorizes the nation by six regions such as New England (Connecticut, Massachusetts, Maine, New Hampshire, Rhode Island, Vermont), Middle Atlantic (New Jersey, New York, Pennsylvania), South Atlantic (District of Columbia, Delaware, Georgia, Maryland, North Carolina, South Carolina, Virginia), Southwest (Kentucky, Louisiana, Alabama, Mississippi, Missouri, Tennessee, Texas), Midwest (Indiana, Illinois, Iowa, Michigan, Minnesota, Ohio,

Wisconsin), and West (California, Oregon) (pp. 30-32). In 1800 there were only 32 institutions of higher education, many of which were located, almost exclusively, on the East coast (p. 19, Table 1.6). As we know, the frontier line did not even reach the Midwest as of 1800, so no wonder colleges and their students concentrated on the East coast. However, note that even in New England, with its highest number of enrolled students, their percentage of the population among the same age/race group is significantly small as Table 1 below shows. Here, the traditional view of college-goers does not betray us: only a small white male population aged 15 to 20 on the East coast region went to college around the beginning of the nineteenth century.

**Table 1. Enrollments in Higher Education Institutions and Percentages of White Male Students in Each Region as of 1800, 1850, and 1890**

|                           | Absolute Number of Enrolled Students |           |                   | Percentage of Enrolled White Males among White Males Aged 15-20 |          |                       |
|---------------------------|--------------------------------------|-----------|-------------------|---|----------|-----------------------|
|                           | 1800                                 | 1850      | 1890 <sup>6</sup> | 1800  | 1850     | 1890                  |
| New England               | 549                                  | 1,926     | 16,544            | 1.22  | 1.28     | -                     |
| Middle Atlantic           | 347                                  | 2,316     | 37,358            | 0.72  | 0.78     | -                     |
| South Atlantic            | 205                                  | 1,895     | 17,591            | 0.38  | 1.28     | -                     |
| South West                | 50                                   | 2,272     | 27,738            | *   | 1.20     | -                     |
| Mid West                  | -                                    | 1,522     | 46,111            | -   | 0.59     | -                     |
| West                      | *                                    | *         | 4,058             | *   | *        | -                     |
| Total (T)/<br>Average (A) | 1,151 (T)                            | 9,931 (T) | 149,400 (T)       | 0.77 (A)  | 1.03 (A) | 1.49 <sup>7</sup> (A) |

\*Data not provided in Burke's Table 2.2

Sources: 1800 and 1850: Burke, Table 2.2;

1890: Burke, Table 5.3, and National Center of Educational Statistics, Table 25.

## 1.2. "What was Taught?": Types of Schools and Their Curricula

What did students learn at college, then? Burke classifies higher educational institutions into nine: liberal arts, law, medical, theological, normal, military, scientific, technical, and women's (p. 216, Table 5.1). He provides the numbers of institution only in the first four categories from 1800 to 1850 because the latter four did not exist except for the case of Mount Holyoke<sup>8</sup>. Our Table 2 reveals that in 1800 almost all institutions taught liberal arts as the actual number and percentage among the total number in each type point out.

**Table 2. Enrollments in Various Types of Higher Educational Institutions and Their Percentage among the Total as of 1800, 1850 and 1890**

|                   | Enrollments of 1800 |            | Enrollments of 1850 |            | Enrollments of 1890 |            |
|-------------------|---------------------|------------|---------------------|------------|---------------------|------------|
|                   | Number              | Percentage | Number              | Percentage | Number              | Percentage |
| Liberal Arts      | 1156                | 93.5       | 9931                | 56.6       | 44000               | 30.3       |
| Law               | 21                  | 1.7        | 621                 | 3.5        | 4000                | 2.8        |
| Medical           | 50                  | 4.0        | 5996                | 34.2       | 22000               | 15.2       |
| Theological       | 10                  | 0.8        | 1008                | 5.7        | 7000                | 4.8        |
| Normal (Teachers) | -                   | -          | -                   | -          | 45000               | 31.0       |
| Military          | -                   | -          | -                   | -          | -                   | -          |
| Scientific        | -                   | -          | -                   | -          | -                   | -          |
| Technical         | -                   | -          | -                   | -          | 10000               | 6.9        |
| Women's           | -                   | -          | -                   | -          | 13000               | 9.0        |
| Total             | 1237                | 100        | 17556               | 100        | 145000              | 100        |

Sources: Burke, Table 5.1.

From the two tables above, we can see that only a small proportion of white males, aged 15-20, went to college; most of them majored in liberal arts as of 1800.

The type of school determines its curriculum. Unlike schools giving students instruction in specific knowledge with a specific career in mind upon graduation like law, medicine, or theology, liberal arts colleges trained their students in broader subjects.

The “traditional liberal arts” curriculum usually makes an emphasis upon the study of divinity, classics, mathematics and philosophy. The first well-defined curriculum of Harvard (founded in 1636), the first American college, includes the seven liberal arts<sup>9</sup> (except music) such as Greek, Hebrew, “Eastern tongues,” physics, ethics, politics, and divinity (Butts, p. 47). It is true there was some variation among colleges in curriculum. For instance, stricter Yale (founded in 1701) was more loyal to a prescribed curriculum than Harvard (Butts, p. 65). Younger and freer King's College (established in 1754, which changed its name to Columbia College in 1784) strived to offer broader and more literary-emphasized subjects like the arts of reasoning, writing, speaking in English, but ended up with a similarly prescribed typical curriculum comprised of classics, Latin and Greek grammar, literature, rhetoric, ethics, and philosophy (Columbia University, 1904, pp. 450-451)<sup>10</sup>. In sum, all colleges shared to some extent the tradition of liberal arts, which was born in medieval and Renaissance Europe, and transmitted, via Oxbridge, to Harvard.

### 1.3. What Were They Educated for?: Purposes of Colleges

Under the strict curriculum concentrating on classics and philosophy, then, what kind of young

adults did the college want to make? There is a plethora of discussion on the purpose of college, but one dominant purpose of college, on which we can agree, is making “gentlemen” and ministers, both of whom were needed as leaders in contemporary society. In fact, the first curriculum at Harvard reflects liberal arts “suitable for the education of a ‘gentleman’” as in the Renaissance (Butts, p. 37)<sup>11</sup>. Therefore, the purpose of liberal arts education is to train young men in a “rounded curriculum” including the classics, preparing them to live the good life as gentlemen or ministers (Butts, p. 23).

Actually, it is proven that the liberal arts curriculum was successful in creating leaders of society when we see the statistics. The mean percentage of alumni of New England colleges entering the ministry in the 1800s is 24% (Burke, p. 62, Table 2.4) , and the averages of other popular professions among the same subject group are lawyers at 48%, physicians at 13%, and teachers at 16%<sup>12</sup>. Ministers, lawyers, physicians, and teachers were respectable occupations, regardless of job income. More importantly, however, students tended to be “remembered” as respectable persons. Burke argues that

. . . the colleges continued to produce a high percentage of alumni who received national attention. The students were important to national and local government, industry, and finance, and even science and invention in America. The alumni had a higher participation rate in government, including Congress, than the non-college population, and they were much more likely than others to be remembered in biographical volumes and to be members of the scientific societies of their time. (p. 98).

The statistics support his statement. The following table illustrates the percentage of alumni who appeared in various records.

**Table 3. Percent of Students Who are “Remembered” in Records as of 1800s and 1850s<sup>13</sup>**

|                                | % Traced to National Biographies |             | % Traced to State-Local Biographies |            | % Known in U.S. Congress |            | % Known to Participate in State-Local Government |             | % Known to Participate in National Government |            | Number of Subjects |             |
|--------------------------------|----------------------------------|-------------|-------------------------------------|------------|--------------------------|------------|--|-------------|---|------------|--------------------|-------------|
|                                | 1800                             | 1850        | 1800                                | 1850       | 1800                     | 1850       | 1800   | 1850        | 1800  | 1850       | 1800               | 1850        |
| Harvard                        | 17.9                             | 21          | 16.4                                | 5.7        | 2.9                      | 4.2        | 20.8   | 20.3        | 7.4   | 4.5        | 67                 | 261         |
| Yale                           | 17.5                             | 17.4        | 10.9                                | 6.9        | 6.5                      | 1.0        | 40.6   | 20.9        | 9.8   | 3.0        | 91                 | 229         |
| Other New England Colleges     | 11.2                             | 9.8         | 12.9                                | 6.3        | 7.5                      | 0.4        | 22.5   | 28.3        | 6.9   | 1.5        | 187                | 713         |
| Princeton                      | 12.7                             | 11.0        | 0                                   | 7.0        | 0                        | 1.0        | 27.6   | 15.0        | 6.3   | 2.0        | 47                 | 100         |
| Union                          | 2.0                              | 9.9         | 4.0                                 | 3.3        | 2.0                      | 1.6        | 4.0  | 14.8        | 2.0   | 1.6        | 49                 | 121         |
| Columbia                       | 4.9                              | 3.7         | 0                                   | 0          | 1.6                      | 0          | 3.2  | 13.2        | 1.6   | 0          | 61                 | 53          |
| U. of Pennsylvania             | -                                | 14.5        | -                                   | 3.6        | -                        | 0          | -  | 15.3        | -   | 1.4        | -                  | 137         |
| Other Middle Atlantic Colleges | 2.6                              | 7.0         | 2.6                                 | 4.3        | 2.6                      | 0.9        | 10.5   | 10.5        | 2.6   | 1.9        | 38                 | 776         |
| Average (A)/<br>Total (T)      | 9.8<br>(A)                       | 11.8<br>(A) | 6.7<br>(A)                          | 4.6<br>(A) | 3.3<br>(A)               | 1.1<br>(A) | 18.5<br>(A)                                      | 17.3<br>(A) | 5.2<br>(A)                                    | 2.0<br>(A) | 540<br>(T)         | 2390<br>(T) |

Sources: 1890: Burke, Table 4.7.

From Table 3 above, we can grasp an idea about the alumni of these colleges as leading figures. They are disproportionately noted in National Biographies and participated in politics despite the small percentage of college-goers during the period. Thus, we can consider them to have been respectable leaders of the local community or nation.

## **2. America under Expansion and Radical Changes between 1800 and 1890**

Now we can conceive an image of the typical college student as of 1800. They would be among the small number of white males in liberal arts colleges located in New England. After graduation, they would become ministers, lawyers, teachers, or physicians, and were listed in many registers. This means the colleges existed to train students to be leaders, i.e. for making respectable “gentlemen” who would serve the local community or entire nation. Students did not remain as they were, though. The nation itself underwent significant changes. How higher education institutions, along with students, changed will be seen.

The nineteenth century was a period of unprecedented growth in the United States. As John Caldwell Calhoun, a leading politician and political theorist from South Carolina, exclaimed “We are great, and rapidly—I was about to say fearfully—growing!” in 1817 (as cited in Turner, 1893, p. 7), the United States was expanding under the ideology of “Manifest Destiny.” In 1890, when the frontier was reportedly vanished in the eleventh Census<sup>14</sup>, America counted 44 states and a

population of 62,979,766 (The Bureau of Census, 1949, p. 25). That is to say, the United States had added another 31 states, and its population increased by about 11.9 times, compared with 5,308,483 in 1800. In 1880, the national wealth grew by almost 36.9 times above the wealth of 1805<sup>15</sup>. This is a gross summary of the growth of the United States in the nineteenth century. When resources of the nation, such as land, people, and wealth were developing so fast, what happened to colleges? In fact, colleges also changed in the rapidly changing society. We will look at facts about students, institutions, curricula of the higher education first, and then try to address the reasons for the changes.

## 2.1. Students and Institutions

In order to get a quick view of higher education in 1890, let us turn to our Table 1 again. We see enrollments increased, by almost 130 times, from 1800. This growth is disproportionately great, compared with the population growth (by 11.9 times) during almost the same period. This increase was partly because new institutions were founded over the century and partly because many of higher institutions, either old or new, became bigger with more students<sup>16</sup>. In addition, higher education institutions spread rather evenly beyond the East coast into the South West and the Mid West. The exception was the West which lagged behind. As for racial composition of the student body, we could not find comparable data with those of 1800, but we can presume the gap between non-white and white students enrolled had decreased after the Civil War and up to 1890<sup>17</sup>. As National Center of Educational Statistics (1993) tells us, dramatically more female students were in higher education than ever in 1890, too: 56,000 were female students while 100,000 were male (Table 24, p. 76).

From these data, we grasp a general picture of higher education in 1890 as follows. The higher education suddenly and swiftly expanded geographically to the West with more institutions and students including women and ethnic minorities, though the enrollment, as a percentage of the 18- to 24-year-old population, was still only 1.8% (National Center of Educational Statistics, 1993, Table 24, p. 76).

## 2.2. Curricula in Emerging New Schools

In Table 2 above, we see significant changes from 1800 to 1890 concerning the proportion of students who were enrolled at each type of higher education institution. Two conspicuous characteristics are to be pointed out here. First, the liberal arts type, which had received 93.5 percent in 1800, had only 30 percent in 1890. Second, new types of institutions attracted many students. For example, the “normal type,” where students trained to be teachers, enrolled 45,000 students (31%) and had 1000 more students than “the liberal arts type” did. Another two, technical and women’s, enrolled 6.9%, and 9%, respectively. Both type surpassed the traditional types of law



(2.8%) and theology (4.8%).

Changes in the types of higher education institutions definitely affected the curriculum students learned. Traditional schools for liberal arts, law, medicine, or theology stayed somehow unchanged, retaining much of the old curriculum to 1890<sup>18</sup>. This does not mean, however, they kept holding the same leading roles as they had done before. After a series of debates on the curriculum at Yale, Harvard, Columbia, and other old colleges founded by the early nineteenth century, the traditional types began losing relative importance among emerging institutions<sup>19</sup>.

### **3. From “Gentlemen” to “Technologists” of the “Industrial Classes”**

Newly founded higher education institutions acquired a new clientele and were gaining relative importance compared to traditional institutions that featured liberal arts. In this section, we will attempt to address which kind of education was given in the new institutions, for whom, and for what purposes in 1890.

#### **3.1. Birth of “Multipurpose Colleges”**

Geiger (2000a) calls the period between 1850-1890 “the era of multipurpose colleges,” with “the proliferation of colleges at nearly as rapid a rate as student enrollments” (pp. 127 and 132). According to Geiger, multipurpose colleges need to be understood “only with reference to the classical colleges that preceded and to some extent coexisted with them” (p. 139). This means these new colleges were born in response to the older colleges and to social demand. As already mentioned, while the classical courses in liberal arts were “varied but essentially the same,” teaching Latin, Greek, mathematics, and sciences for subsequent professional study and contribution to public life (p. 139), new types of schools began offering more specific and frankly different intellectual or practical courses. For instance, in fast-developing “normal” schools, the purpose of education was one and only, i.e. to create teachers for primary and secondary schools which were also developing rapidly with increasing numbers of students.

#### **3.2. The First Morrill Act and Making of Technologists in Land-Grant Institutions**

The technical “type” of higher educations will be paid more attention than others here, because it is more deeply related to modernization and the industrialization of society. One of the most effective legislative acts on higher education is undoubtedly the Morrill Land-Grant Act in 1862<sup>20</sup>. The Act was proposed by Justin Smith Morrill, a Congressman from Vermont, and after passage, signed by Abraham Lincoln. It authorized several states to utilize public lands in order to create colleges according to population: “AN ACT Donating Public Lands to the several States and Territories which may provide Colleges for the Benefit of Agriculture and Mechanic

Arts” (Land Grants, 1862). As the Act explicitly specifies, its purpose was to develop practical education in agriculture and mechanical arts. The Act is permissive enough for a state to found a college or university freely within its prescription<sup>21</sup>, but many of the newly founded schools were designed for the two fields above mentioned. According to Geiger (2000b), there were forty land-grant institutions or units in 1875 including Yale College (Sheffield Scientific School), Michigan State Agricultural College, and Pennsylvania State College—to mention a few (Table 7, p.163). In addition to these two popular fields, whether from land-grant or not, more schools specializing in science or engineering such as Union College (Engineering School), Rensselaer Polytechnic Institute, and Massachusetts Institute of Technology, were listed as “institutions for higher education in applied science” (Table 6, p. 156). Since a good many new institutions opened during this period, no wonder the enrollment to the “technical” or “applied” type developed very fast.

### 3.3 Technologists for American Society

Making new institutions for agriculture and engineering was thus a national policy. Then why were they considered important for the United States? This is because these two fields were getting expanded and modernized after approximately 1850<sup>22</sup>. As for agriculture, The Bureau of the Census (1949) shows the number of farms and the total value of farm land and buildings increased, respectively from 1,449,000 and 3,272 million dollars to 4,565,000 and 13,279 million dollars between 1850 and 1890 (Series E 1-5., p. 95). Also it demonstrates how machineries and fertilizers were spreading during this same period. In 1850, the value of farm implements and machinery was “152” while “494” in 1890; chemical fertilizers consumed were “53” in 1850 while “390” in 1890 (Series E 105-116., p. 100). This data tells us that agriculture was a growing industry and needed more people to engage in it. The same industrialization/modernization was happening to other areas of industry such as construction, manufacturing, transportation and so on<sup>23</sup>.

American society needed the above-mentioned modernization and industrialization. Then, the next question would be who was expected to be in charge of this modernizing society. The answer would be new leaders, technologists, who could respond to the quickly industrializing society with useful applicable knowledge. Daniel Coit Gilman (1872), Professor of geography at Yale’s Sheffield Scientific School, explicitly points to the workforce the society values. It is relevant enough to cite a rather long passage here to understand what technologists were supposed to be:

It has been shown elsewhere in the organization and management of the national schools the influence of three distinct social wants is apparent.

First, and most easily recognized is the need, which is felt throughout the land, of able, educated, trustworthy technologist, such as well-informed engineers, architects, mechanics, manufacturers, miners, agriculturalists, and the like. Such men the necessities of the country

are loudly calling for. They find ready and lucrative employment; they contribute to the development of the national wealth. While their general culture should be as good as possible, they must be men who know how to put into practice the principles they have learned; men who can apply to the requirements of modern society the discoveries of modern science. They must be expert, and to make them so their training must be technical, that is to say, it must have a decided bearing upon some useful calling. (pp. 10-11).

The “able, educated, trustworthy technologist” whom “the necessities of the country are loudly calling for” could get good employment and serve to increase the national wealth. It is implied, furthermore, the technologists can be as good as the “gentlemen” who study liberal arts and will be “remembered”; they are practical, getting technical training and using their knowledge based on modern science.

Gilman (1872) also points out two more characters the society wants: “more skillful laborers” who know “the natural laws underlying manufacturer’s processes”; “a great many men of science” “to carry forward scientific investigations and to contribute to the advancement of knowledge, on which all useful arts depend” (p. 11). Society needed these three groups of people: technologists, skillful laborers, and men of science. All of them were expected to be useful in their distinct ways. However, Gilman saw that the new land-grant institutions should be primarily dedicated to the first, most important need: technologists, as Geiger also maintains (2000b, p. 162). The reason is because Gilman presumed the other two social needs could/should be trained in other institutions such as industrial or trade schools for skilled laborers and in the budding research universities or graduate schools for men of science<sup>24</sup>. Here, therefore, technologists were envisioned as a fruit of the “practical education of the industrial classes” that the Morrill Act wanted to produce.

#### **4. “Gentlemen,” “Technologists,” and Beyond: Concluding Remarks**

We have so far traced the changes higher education experienced from 1800 to 1890. Higher education institutions were almost solely attended by a few white males in traditional liberal arts colleges to train them to be “remembered” as “gentlemen” in 1800. On the other hand, by 1890, there emerged various types such as teachers’, technical, and women’s with a far greater number of students in a far greater number of institutions than before. These changes proceeded along with the expansion of national land, population and, consequently, wealth, in response to the demands of this developing society. Colleges and universities continued producing “gentlemen” to be “remembered” in 1890<sup>25</sup>, but started to make far more “teachers” and “technologists” useful to the current society. We cannot discuss in detail the socio-economical composition of the student body in 1890, but there definitely were more students from humble families, ethnic minorities, and

women than had been enrolled in 1800 as new types of institutions graduated many of them<sup>26</sup>. This means higher education in 1890 was far more open than that of 1800 or 1850.

This is a historical overview of higher education between 1800 and 1890. Remember, the purpose of this paper is not to make an argument. We would rather describe the changes over this period. However, while answering the two questions of “Who goes?” and “What should be taught?”, we discovered two other questions: what kind of youth, among the same age group, society needed as leaders for the community or entire nation?; how much proportion of the population society wanted for the specific leaders? These questions inevitably bring us to an intriguing topic of two contrasting concepts of equity and excellence, which unfortunately we were not able to address. We will finish this paper referring to this topic, however, here in the last section.

Opening the doors of higher education to more people reminds us of Thomas Jefferson’s idea of public education in his unadopted “Bill for the More General Diffusion of Knowledge” as part of the revision of Virginia’s Laws (1779). It proposed that the most talented male students in Virginia be provided with free elementary and secondary education and that the most outstanding of these have access to William and Mary College. They would be chosen “without regard to wealth, birth, or other accidental condition, or circumstance” (Section I). Moreover, this legislative bill also called for a system of free elementary education for all (free) male and female children. His belief in public education and the government responsibility for it has epitomized in his letter to James Madison: “Educate and inform the whole mass of the people. Enable them to see that it is their interest to preserve peace and order, and they will preserve them” (1787).

This concept of “education for all” somehow had not died away over the course of time, and consequently supported the movement to found new colleges with free or lower tuition by the late 1870s. Cooper Union College, with which we began this paper, was one of them; it has been providing free education to all enrolled students since its foundation in 1859. The Servicemen’s Readjustment Act of 1944, commonly known as the G.I. Bill, played the same role on a massive scale. It provided various insurance and educational benefits (college or vocational) for returning World War II veterans. Many universities, including Ivy League schools, created schools specifically prepared for G.I.s which continue to offer courses<sup>27</sup>. We can understand these policies as an example of equity, by giving opportunities to get higher education to the veterans who, in general, were not socially/economically privileged. In addition to the G.I. Bill, the Affirmative Action is a good example for building equity and equality, compensating for disadvantageous treatment by previous laws and customs.

Of course, higher education institutions have never been totally open to everyone. The proportion of ethnic minorities and women in the enrollment had stayed smaller than that of white males for a long time. On the contrary, higher education has another aspect as a center of excellence only for a talented few people. It has always aspired to produce excellent students to

lead the community or nation. Here we remember Alexander Hamilton who argues for men of reason to govern the republic. In contrast to Jefferson whose ideal was a “self-governing republic” in rural neighborhoods or wards, Hamilton believed that matters of state should be governed by the “leadership of the well-educated and well-bred”<sup>28</sup>. And it was in colleges where these leaders were produced: thirty-six out of eighty-nine signers of the Declaration of Independence and the Constitution were “products of the colonial colleges—Adams, Hamilton, Jay, Jefferson, and Madison among them” (Rudolph, 1977, p. 56).

Now we will return to Gilman’s “three characters” that society wanted. He deliberately drew a hierarchal picture of three layers in industrial society only beginning to develop. At the top, men of science who produce knowledge “on which all useful arts depend”; in the middle, technologists “who can apply to the requirements of the modern society the discoveries of modern science”; and, at the bottom more skilled laborers who are “more useful to the country, and are worth much higher wages than any other laborers” (p.10). No doubt by land-grant institutions Gilman, as well as Morrill, did intend to strengthen the group in the middle, the technologists, more than the two other groups at top and bottom<sup>29</sup>. For Gilman, creating technologists enlarged the population useful for the then developing nation, but at the same time, he differentiated them from men of science producing knowledge and skillful laborers manually working with very limited knowledge except for their work. Gilman did not seemingly wish to welcome every person to his school. Indeed he believed in reason and the potential excellence of a given group of students, while arguing that many people, including manual laborers, could have a better life when trained properly.

In this paper, we have followed the trajectory of higher education as sites to produce gentlemen in 1800 and technologists in 1890. We, as well as other scholars, may well find this a vulgar generalization. It is true we covered neither women’s or race-oriented institutions<sup>30</sup>, nor did we discuss in detail the backgrounds and careers of students in 1890 because of limited space. Limited as it is, the discussion in this paper suggests that in 1890 the ideology of democracy and reason coexisted somehow to change higher education institutions while representing equity and excellence respectively. The making of many new leaders for the industrializing nation can be considered a compromise between two ideologies, first reason/excellence for the old gentlemen-producing colleges, and, second, democracy/equity for the new popularizing universities. As we mentioned above, this is because higher education still possessed a hierarchical structure (men of science; able, trustworthy technologists; and skillful laborers), even as the new institutions began opening their doors.

Since the twentieth century through the beginning of the twenty-first century, higher education has been advancing in its spectrum toward equity/democracy rather than excellence/reason. Now there are 17,673 institutions with an enrollment of 20,428,000 with 8,770,000 males

and 11,658,000 females in 2009, according to the National Center for Educational Statistics (National Center for Educational Statistics, n.d.). A far larger number of types of schools exist and so does a more wide-ranging curriculum. However, many institutions still stick to at least some core curriculum which resembles a traditional liberal arts education. Columbia University, for example, has provided a core curriculum, required of all the undergraduate students, including those at The School of General Studies<sup>31</sup> (The Core Curriculum). The debates over the curriculum are ongoing. And from a vantage point, where we are now, we can understand that the discussion “what should be taught” started in the 1820s as seen in the Yale Report (1828) and reached some equilibrium by 1890 when old and new institutions coexisted and balanced each other. We must still pay attention to the composition of the student body and to the content of the curriculum, in order to more deeply investigate American higher education.

### Notes

- 1 These are key questions of “Purposes and Policies of Higher Education,” a course conducted by Professor Arthur M. Langer at Teachers College, Columbia University (Summer 2011: ORLH4010). This paper was inspired by the class which Professor Langer generously let me sit in on. For the course description, see <http://www.columbia.edu/cu/bulletin/uwb/>.
- 2 For example, see Roger L. Geiger (Ed. 2000) and many academic journals such as *Perspectives on the History of Higher Education*. As for currently published books concerning higher education, refer to *The New York Review of Books* for articles by Andrew DelBanco and Anthony Grafton.
- 3 Yoshimi (2011) delineates the history of Japanese higher education in Chapter III (pp. 107-172). He understands the Japanese University during this period as instrumental for “translating/transferring western knowledge” and makes comments about other universities in Asia, too (pp. 108-110).
- 4 According to this document, The Bureau of the Census (1949), “Perhaps the basic weakness of the 19th century figures is that important types of wealth were covered incompletely or not at all” (p. 2).
- 5 He surveyed “the students in all colleges and in all regions of the country between 1800 and 1860” as a ten-year project, locating “complete lists of the students of the various institutions” from the “materials held by the Library of Congress,” “the old Bureau of Education, the National Library of Medicine, the libraries of almost all colleges and universities, and many state, local, and professional historical society libraries,” “alumni registers, class books, and alumni and archival files . . . .” At the same time, he took “a 10 percent random sample from full period,” which was followed “through all national, regional, state, and large city biographical registers and through professional rolls, local histories, and biographical volumes,” and also “[g]overnmental registers and fraternity materials.” In order to have a complete life history of the students of the colleges, a profile questionnaire consisting of twelve questions was also completed. (pp. 93-94)
- 6 I used the data of 1889-1890 in National Center of Educational Statistics (1993) for the year 1890 because no other data is available.
- 7 See Burke, p. 215, and Table 5.3 on p. 218.
- 8 The then called Mount Holyoke Female Seminary was founded in 1837 as the first of the Seven Sisters. Seven

sisters refer to female liberal arts colleges including Barnard College, Bryn Mawr College, Radcliffe College, Smith College, Vassar College, and Wellesley College, all of which were founded between 1837 and 1889 on the East coast. Radcliffe (which merged with Harvard College) and Vassar (which is now coeducational) are no longer women's colleges.

- 9 According to Butts, this idea originated in the “medieval seven liberal arts” of “the trivium of grammar, rhetoric, and logic, and the quadrivium of arithmetic, geometry, astronomy, and music” spelled out by Martianus Capella, Roman writer of Africa who flourished in the fifth century. Butts also suggests that all of these also can be traced back to the ancient Greeks (p.25).
- 10 For the failed curriculum, see “Advertisement” to parents of prospective students by Samuel Johnson, the first president (Columbia University, 1904, pp. 444-445) and Butts (p. 68). Even though this reform failed, Columbia College has always been in the frontline of incorporating non-traditional subjects more than other Ivy League colleges. Only two years after the Yale Report (1828) was published, the Trustees of Columbia opened a new “Scientific and Literary Course” in order to “extend the benefit of education in greater abundance and variety’ than were offered in institution previously established” (Columbia University, 1904, p. 112).
- 11 For the purpose of the liberal arts education, see, specifically, the second of the following “three ideals, or theories, of higher education” Butts finds in the first curriculum of Harvard.

1. The Medieval idea of the seven liberal arts as the entire round of studies necessary for a liberal education and as preparation for later professional study.
2. The Renaissance ideal of classical studies as the best means of arriving at a liberal education whether in church or in state. This included a thorough study of classical languages and enough of classical literature to indicate a “gentlemanly” education.
3. The Reformation ideal of religious control of higher education for sectarian purposes and for preparation of ministers who would defend and propagate particularized religious doctrine. (p. 47)

- 12 This is calculated by the author using data provided by Burke in “Table 4.3: Estimates of Percent of Students With at Least one Known Occupation Who Were Ever Once in Various Occupations for Various Colleges and Groups of Colleges, 1800-1860 by Decade of Entry Into College” (p. 144). He enumerates, for lawyers, 49% at Harvard and 49% at Yale, and 45% at other New England Colleges; for physicians, 18% Harvard, 8% Yale, and 12% others; for teachers, 8% Harvard, 23% Yale, and 17% others. Be aware there was not a clear notion of career and people usually had several various occupations during their lifetime. This is why the numbers amount to above 100% in total (pp. 62 and 144) .
- 13 Though the original table covers New England colleges to Midwest colleges, I have only quoted two regions, New England and Middle Atlantic, because of the scarce numbers for the other regions in 1800s.
- 14 The frontier is defined as the place with a population density of six or fewer people per square mile.
- 15 The total amount of valuation of property and related data was 92,333 million dollars. Calculated by the author from “Table 2: Valuation of Property and Related Data 1850 to 1880 (The Bureau of Census, 1949, p. 2).
- 16 Roger Geiger (2000a) numbers 415 for colleges, 44,133 for college enrollments in 415 colleges, and 106 for the average enrollments (college size) for 1890 (Table 3, p. 133). Remember there were only 1,151 students

in 32 institutions in 1800, as shown in Section 1.1 above; we can assume the average college size was about 36 enrollments back then.

- 17 National Center of Educational Statistics (1993) shows an interesting figure entitled “Percent of 5- to 19-year olds enrolled in school, by race: 1850 to1991” though (Figure 1, p. 6). It demonstrates that, among the whole population of this age group, less than 5 percent of non-white students and about 55 percent of whites were in primary, secondary or tertiary education in 1850. This shows during the antebellum period, there was a very small population of non-white students at any level of any school.
- 18 Geiger (2000a) is deliberate enough to note three aspects despite the traditional research which stresses the difference between 1850 and earlier, though: first, the majority of new institutions were denominational; second, the average college size was fairly stable; and last, traditional colleges were growing up toward the peak year of 1893 (p. 132).
- 19 The most important debate among them is the Yale report in 1828 in which the college defended liberal arts education despite the alleged disadvantages of this traditional education. For a detailed discussion, see Frederick Rudolph (1977, pp. 67-72), and R. Freeman Butts (1939, pp.118-125). Geiger (2000a) pertinently summarizes the argument of this Yale report into four essential points (p. 140).
- 20 This paper does not discuss the second Morrill Act (1890), for it is out of my time scheme.
- 21 Here is the excerpt showing the purpose of the Act:

Sec.4. (8) Provided, That the moneys so invested or loaned shall constitute a perpetual fund, the capital of which shall remain forever undiminished (except so far as may be provided in section 5 of this Act), and the interest of which shall be inviolably appropriated, by each State which may take and claim the benefit of this Act, to the endowment, support, and maintenance of at least one college where the leading object shall be, without excluding other scientific and classical studies and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts, in such manner as the legislatures of the States may respectively prescribe, in order to promote the liberal and practical education of the industrial classes on the several pursuits and professions in life (Land Grants, 1862).

- 22 We do not have data concerning agriculture before 1850 because the United States Department of Agriculture started issuing annual agricultural statistics of a wide variety only on May 1, 1863. Other data used in The Bureau of the Census (1949) are from the Bureau of the Census, the Department of Commerce which conducts the Census of Agriculture, and the Department of Agriculture. (p. 74).
- 23 For detailed information, see The Bureau of the Census (1949) on pp. 169, 179, and 200, for instance.
- 24 For the reference, see James Turner and Paul Bernard (2000).
- 25 Unfortunately we do not have the relevant data of alumni to be “remembered” for 1890 as in Table 3. And yet we can presume that they kept producing “gentlemen,” lawyers, medical doctors, and ministers though in smaller proportion, because still a substantial number of students were majoring in these areas, and they were still needed in society.
- 26 A number of black schools were born in the antebellum period such as the Institute for Colored Youth in Philadelphia (1837), Avery College in Allgheny, Pennsylvania (1849), the Ashmun Institute, later renamed Lincoln University, in Chester County, Pennsylvania (1854), and Wilberforce University in Wilberforce, Ohio



- (1855) (Geiger, 2005, p. 21).
- 27 At Columbia University, for example, the School of General Studies was opened in 1947 to accommodate returning World War II veterans whose education was financed by the G.I. Bill. The school is recruiting even now servicemen and women currently in the Marines or the Military (Winerip, 2011).
- 28 For the contrasting powerful beliefs, democracy and reason, see John Freedmann (1987, pp. 3-4).
- 29 Note that the making of the middle class is related to professionalism. For a detailed discussion, see Burton J. Bledstein (1976).
- 30 The women's college is not only a type of new higher education institutions but has a distinct, complicated history, organization, and student body—to be addressed in detail. Race-oriented colleges also need special attention and a separate discussion.
- 31 Among them, the oldest course is "Contemporary Civilization" which started in 1919 (Columbia University, n.d.). Professor Andrew Delbanco argues for the importance of the core curriculum and criticizes decreasing face-to-face contact between professors and students (Gittelsohn, 2011).

### References

- Bledstein, B. (1976) *The Culture of Professionalism: The Middle Class and the Development of Higher Education in America*. New York, NY: W. W. Norton.
- Bureau of the Census, The. (1949). *Historical Statistics of the United States 1789-1945: A Supplement of the Statistical Abstract of the United States, Prepared by the Bureau of the Census with the cooperation of the Social Science Research Council*, 1949. Retrieved from <http://www.census.gov/prod/www/abs/statab.html>
- Burke, C. (1982) *American Collegiate Populations: A Test of the Traditional View*. New York, NY: New York University Press.
- Butts, R. (1939). *The College Charts Its Course: Historical Conceptions and Current Proposals*. New York, NY: McGraw-Hill.
- Columbia University. (1904). *A History of Columbia University, 1754-1904; Published in Commemoration of the One Hundred and Fiftieth Anniversary of the Founding of King's College*. New York, NY: The Columbia University Press. Retrieved from <http://www.archive.org/stream/historyofcolumbi00coluoft#page/n9/mode/2up>
- Columbia University. (n.d.). The Core Curriculum. Retrieved from <http://www.college.columbia.edu/core/>
- DelBanco, A. (2007, March 29). Scandals of Higher Education. *The New York Review of Books*. Retrieved from <http://www.nybooks.com/articles/archives/2007/mar/29/scandals-of-higher-education/?pagination=false>
- Freedmann, J. (1987). *Planning in the Public Domain: From Knowledge to Action*. Princeton, NJ: Princeton University Press.
- Geiger, R. (2000a) The Era of Multipurpose Colleges in American Higher Education, 1850-1890. In R. Geiger (Ed.), *The American College in the Nineteenth Century* (pp. 127-152). Nashville, TN: Vanderbilt University Press.
- Geiger, R. (2000b) The Rise and Fall of Useful Knowledge: Higher Education for Science, Agriculture, and the Mechanic Arts, 1850-1875 . In R. Geiger (Ed.), *The American College in the Nineteenth Century* (pp. 153-168). Nashville, TN: Vanderbilt University Press.

- Geiger, R. (2005). An Equity and Excellence Time Line. In Bowen W., Kurzweil M., & Tobin E. (Eds.), *Equity and Excellence in American Higher Education* (pp. 13-38). Charlottesville, VA: University of Virginia Press.
- Gilman, D. (1872). Reports on the National Schools of Science. Retrieved from <http://www.archive.org/details/reportnational00gilmrch>
- Gittelsohn, B. (2011, October 25). Delbanco Says Core Threatened by Increasing Class Size, Calls on Columbia to Focus on the College. *Columbia Daily Spectator*. Retrieved from <http://www.columbiaspectator.com/2011/10/25/delbanco-says-core-threatened-increasing-class-size>
- Grafton, A. (2011, November 24, 2011). Our Universities: Why Are They Failing? *The New York Review of Books*. Retrieved from <http://www.nybooks.com/articles/archives/2011/nov/24/our-universities-why-are-they-failing/?page=1>
- Jefferson T. (1779). Bill for the More General Diffusion of Knowledge. Retrieved from <http://www.loc.gov/exhibits/jefferson/images/vc64.jpg>
- Jefferson T. (1787). Letter to James Madison. (Forrest version) ME 6:392. Retrieved from <http://yamaguchy.com/library/jefferson/madison1.html>
- Land Grants: First Morrill Act, Act of July 2, 1862, ch.130, 12 Stat.503,7 U.S.C.301 et.seq. Chap. CXXX. Retrieved from <http://www.higher-ed.org/resources/morrill1.htm>
- National Center of Educational Statistics. (1993). *120 Years of American Education: A Statistical Portrait*. Retrieved from <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=93442>
- National Center for Educational Statistics. (n.d.). Fast Facts. Retrieved from <http://nces.ed.gov/fastfacts/display.asp?id=84> and <http://nces.ed.gov/fastfacts/display.asp?id=98>
- Perez-Pena, R. (2011, October 31). Cooper Union Looks at Charging Tuition. *The New York Times*. Retrieved from [http://www.nytimes.com/2011/11/01/education/cooper-union-may-charge-tuition-to-undergraduates.html?\\_r=2&adxnln=1&seid=auto&smid=tw-nytimes&adxnlnx=1322511693-L4YVpKAOorpNH5PY4IE2Vw](http://www.nytimes.com/2011/11/01/education/cooper-union-may-charge-tuition-to-undergraduates.html?_r=2&adxnln=1&seid=auto&smid=tw-nytimes&adxnlnx=1322511693-L4YVpKAOorpNH5PY4IE2Vw)
- Rudolph, F. (1977). *Curriculum: A History of the American Undergraduate Course of Study Since 1636*. San Francisco, CA: Jossey-Bass.
- Turner, F. (1893). The Significance of the Frontier in American History (2010). In *The Frontier in American History* (pp. 7-27). Lawrence, KS: Digireads.com.
- Turner J. & Bernard, P. (2000). The German Model and the Graduate School: The University of Michigan and the Origin Myth of the American University. In R. Geiger (Ed.), *The American College in the Nineteenth Century* (pp. 221-241). Nashville, TN: Vanderbilt University Press.
- U.S. Census Bureau. (n.d.a). POP Culture 1790. Retrieved from [http://www.census.gov/history/www/through\\_the\\_decades/fast\\_facts/1790\\_fast\\_facts.html](http://www.census.gov/history/www/through_the_decades/fast_facts/1790_fast_facts.html)
- U.S. Census Bureau. (n.d.b). POP Culture 1890. Retrieved from [http://www.census.gov/history/www/through\\_the\\_decades/fast\\_facts/1890\\_fast\\_facts.html](http://www.census.gov/history/www/through_the_decades/fast_facts/1890_fast_facts.html)
- Winerip, M. (2011, November 14). Recruiting Veterans, Columbia Finds an Impressive Applicant Pool. *New York Times*, p. A14. Retrieved from [http://www.nytimes.com/2011/11/14/education/columbia-actively-recruits-veterans.html?\\_r=1&adxnln=1&smid=fb-share&src=tp&adxnlnx=1321286483-MuTi6Cuvtom9ntFMXpS+DA](http://www.nytimes.com/2011/11/14/education/columbia-actively-recruits-veterans.html?_r=1&adxnln=1&smid=fb-share&src=tp&adxnlnx=1321286483-MuTi6Cuvtom9ntFMXpS+DA)
- Yoshimi, S. (2011). *Daigakutoha Nanika?* (What is the Univeristy?). Tokyo, Japan: Iwanami Shoten.