CLIOMETRICS AND THE COLLEGES: The Campus Condition, 1880 to 1910

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The use of statistics and ratios of institutional performance has become integral to the study of organizations in higher education. Unfortunately, analyses have been limited because HEGIS data and other comprehensive statistical bases have been compiled only for recent years. This study advances the notion of cliometrics—historical statistics—as a strategy for joining the study of the past and present condition of colleges and universities. To illustrate the applications of cliometrics, case studies of enrollment, retention, and attrition for the period 1880 to 1910 at Amherst, Harvard, Transylvania, Kentucky, and The College of William and Mary were summarized. The residual finding is that careful analysis of each institution's retention profiles prompts researchers to rethink the conventional wisdom about going to college as a cohesive, four-year experience a century ago.

INDICATORS OF INSTITUTIONAL HEALTH

During the past five years, a number of groups, including the National Association of College and University Business Officers (Dickmeyer and Hughes, 1979), the Association of American Colleges (Bowen and Minter, 1976), and the National Association of Independent Colleges and Universities have contributed to academic planning and applied research by introducing deans and presidents to the use of HEGIS (Higher Education General Information Survey) statistics for plotting patterns and ratios as indicators of institutional health. Workshops often included mention of historical data, raising hopes that perhaps strategic planning and institutional research finally had overcome the myopia of the present by linking contemporary data and

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projections with systematic information from the past. Unfortunately, the related charts and graphs promised more than they delivered; i.e., the data did not include trends from 1900, or even from 1960. For institutional planners of the 1980s, historical data included statistics from the years 1976 through 1979. The major disappointment is that one is expected to accept the proposition that the statistical past stretches back only about a decade.

Need researchers be confined to this limited depiction of organizational performance over time? Disappointment leads to the question, "What could researchers learn about colleges and universities of a century ago if perchance each institution had collected the kinds of data most campuses now gather for the annual HEGIS reports?" Since trends and patterns make sense only if they are displayed as a "run" over several years, might not such belated HEGIS information give increased capability to institutional research that is devoted to the notion of long range planning?

Today we take for granted the systematic collection of institutional records in such areas as admissions, enrollments, library holdings, degrees conferred, and finances. In fact, readily available HEGIS reports are a relatively new resource for research in higher education. Too often, campus administrators complain about the chore of collecting HEGIS data while forgetting the purpose of the errand: to analyze campus condition and performance. As Lunney (1979) noted, undigested HEGIS forms often are a forgotten data base hidden in the closet. This research calls for renewed attention to the uses of HEGIS-style data; in its broadest sense, the concern is with developing and refining the notion of cliometrics—historical statistics—at selected American colleges and universities from circa 1880 to 1910. This is the period which roughly coincides with the emergence of the modern American university organizational scheme (Veysey, 1965). The first step involves straightforward data collection; i.e., using such disparate archival materials as catalogues, yearbooks, alumni registers, minutes of board meetings, and faculty reports to compile *ex post facto* the raw numbers which constitute an approximation of HEGIS reports. Research in the archives at Harvard University, Amherst College, The College of William and Mary, Transylvania University, and the University of Kentucky provided a statistical data base from a range of institutions by region, size, and type.

CAVEATS AND CONTEXT: AVOIDING ANACHRONISM

This research perspective is hybrid in its attempt to fuse the so-called quantitative and qualitative approaches. The historian's respect for and fascination with memorabilia, documents, and clutter suggest that the archives can be regarded as a cumulative institutional memory, albeit a selective and sometimes disorganized one. The quantitative research notions of using statistics

and ratios (as usually associated with a present-day institutional research office) can provide some devices for sifting through and organizing disparate archival records, and, ultimately, might offer systematic strategies for analyzing the freshly gathered historical statistics.

The primary danger in this research fusion is to lapse into the fallacy of anachronism—the mistake of attributing the standards and statistical tests of our own era to an earlier period, which neither played by our analytic rules nor kept statistical scores according to our familiar assumptions which we take for granted. For example, data on selective admissions, multiple applications, and the concept of an "admissions yield" are omnipresent today; yet they simply do not work and do not make sense when carried back to the turn of the century. Hence, by respecting the historical context of admissions data from two different epochs, this strand of analysis had to be abandoned.

In numerous categories, however, there is compelling evidence that by the early 1900s many colleges and universities understood in principle the need for record-keeping. A good illustration comes from *Great American Universities* (Slosson, 1910): after careful sorting and consultation with registrars, the author was able to stitch together for 14 major universities the individual and aggregate compilations on annual income; appropriations for salaries and instruction, tuition, enrollments, and library volumes; and degrees granted. Especially important for avoiding the anachronism fallacy is that even by the early 1900s Slosson was tinkering with ratios as a means by which to analyze the university statistics he had compiled. His charts included "average expenditures for instruction per student" and other indices which emphasized the relationships among components rather than merely presenting raw statistics. It was a research approach compatible with prominent institutional analytic strategies used today (Fincher, 1982). Reliance on ratios also was an important breakthrough in research sophistication because it cautioned against unfair comparisons due to sustained growth over time. For example, merely to compare the size of library holdings at a campus in 1980 with those of 1900 leans toward the "Whig Fallacy"—the tendency to see institutional change as inevitably destined toward growth and improvement. However, one could take the concept of ratios—rather than actual numbers—for library holdings to answer important questions within a given historical period.

This is precisely what historian James Axtell (1971) did in his memorable study of the death of the liberal arts college. Axtell used statistics on library holdings and enrollments to test some of the grand claims which "university builders" had advanced in popular articles published in the 1880s and 1890s. For all the puffery about the rise of the large state university and the simultaneous demise of the small private college, Axtell used historical statistics to complicate the conception of higher education in those years. He found,

for example, that in the 1880s, allegedly "small" Amherst College was as large as the University of Wisconsin and the University of Virginia; and Williams College was larger than either Cornell University or Indiana University. An accepted assumption in both 1880 and 1980 was that large library holdings were a sign of *university* status—an indicator of an institution's research mission. Axtell's interesting finding was that the state universities of Michigan, Indiana, Wisconsin, and Minnesota each lagged behind such "small" colleges as Amherst and Wesleyan in the number of books held at their respective libraries.

So although there were no nationally standardized HEGIS forms to fill out in 1890, we can ascertain that by the turn of the century many colleges and universities at least undertook annual compilations of figures in enrollments, finances, degrees conferred, and library holdings. Often necessity was the driving force in convincing colleges to keep thorough records. At Amherst College, for example, an episode of financial mismanagement and hints of embezzlement did much to speed adoption of institutional procedures for preparing systematic annual financial reports in the 1880s. The problem facing historical statisticians is that in the years 1880 to 1910 each institution was insular; i.e., each developed its own schemes and styles for record-keeping, thus making clean comparisons across institutions risky. Although record-keeping was accepted in principle, it remained haphazard and uneven in practice. Merely to settle on a basic, accurate number (e.g., total annual enrollment) is not easy. Consider the case of Transylvania University (known in the 1890s as Kentucky University): this private institution was quite complex; in addition to its historic liberal arts college core, it also had a medical school, a Bible school, an academy, and a self-contained program called "the commercial course." Although official catalogues and presidential reports cite an annual enrollment figure, there is some uncertainty as to how students were counted. Some students in the Bible school cross-registered in the liberal arts college, but some did not. Students in the commercial course might have been included in the annual head count, even though the entire commercial course from entrance to certification was only 12 weeks long. In summary, our standards for full-time equivalent students (FTEs), as distinguished from head counts, were not factored into the enrollment summaries a century ago.

One shred of conventional wisdom is that the late-nineteenth-century colleges were heavily dependent on student fees and tuition payments. Ironically, at the financially struggling College of William and Mary, more than half the students were forgiven tuition charges; and room and board fees often were neither collected nor recorded with much vigor. The temptation is to dismiss the 1890s as a simplistic or irresponsible era of academic management. However, such uneven record-keeping and lax management did not

suddenly disappear from American higher education. Mayhew (1980) points out that until recently even large, prestigious universities often were unable to retrieve promptly accurate and useful financial information. As Mayhew writes about one large university:

> As late as 1967, its financial records seemed to be maintained in pen and ink in schoolboy notebooks. The cautious thrift of the place was well revealed by its maintaining balances of several million dollars in non-interest gathering checking accounts, with the business manager pleased that the bank did not charge for checks written. (pp. 76–77)

SALVAGING "HOUSE HISTORIES": STRATEGIES FOR MICRO-ANALYSIS

Since the early 1960s serious historians of higher education have been complaining that the study of the college and university had been dominated too long by "house histories"—mawkish chronicles of individual institutions that were written without much critical perspective or analysis. One particular weakness attributed to this genre was the reluctance to connect the campus with social, historical, and national trends. Over the past 20 years we have enjoyed the fruits of excellent social and historical researchers devoted to the macro analysis of higher education.

Indeed, this "macro" redirection of the historical analysis of higher education has been desirable and successful. But there persists another complaint about the house histories which calls for redress in research emphases: namely, the campus chronicles—for all their preoccupation with campus details—actually tell little about the patterns of life within an institution. When an author writes the official centennial history of Alma Mater, commissioned by the Alumni Society, data on enrollments and finances usually are taken at face value from second-hand and third-hand accounts. The antidote may be that cliometric analysis of the campus condition can provide fresh and increasingly accurate depictions of year-by-year patterns of life *within* an institution. This approach, however, raises important methodological questions about the study of enrollment, retention, persistence, attrition, and degree completion. The following discussion of some cases and key examples will show how little we actually know about what was meant by "going to college" between 1880 and 1910. The focus, then, is on the insights and research problems prompted by historical statistics generated by colleges' annual reports, official catalogues, and matriculation rosters.

REEXAMINING THE COLLEGES' "GOOD OLD DAYS"

Analysis of college albums, yearbooks, and alumni memoirs (Canby, 1936; Jensen, 1974) indicates an important fact of institutional development: at

most campuses during the period 1880 to 1910 the students had come to accept and glorify the structure and cohesion of the four-year residential college experience. One celebrated one's college class affiliation—designated by the graduation date four years hence, as opposed to one's entry date. The designations of freshman, sophomore, junior, and senior were taken seriously within the campus organization and subcultures. Indeed, it was the tribal cohesion of college loyalty and class affiliation which prompted George Santayana to speak of Yale undergraduates as "a sort of primitive brotherhood" (Santayana, 1892; Jensen, 1974).

The upshot is that the songs, memoirs, and stories of college life have shaped an image of strong class affiliation, with "going to college" at the turn of the century being depicted as essentially a shared four-year experience. One research task is to test whether this dominant image matched with historical realities. In 1929, for example, the Dean of Princeton cautioned against the exaggerations of nostalgia; his subsequent examination of the actualities of college life gave substance to the contention that the alleged "good old times" were not so good as the images suggested (Gauss, 1929). For cliometric analysis, one important concern is whether, in fact, the *claims* of cohesion during the four-year college experience were supported by a record of strong persistence and degree completion.

Contrary to conventional wisdom and nostalgia, there is evidence of a substantial drop-out rate and low graduation rate in American colleges and universities circa 1880 to 1910. The finding is especially ironic in that the high attrition and low graduation rates occur in an era characterized by "elite" access to higher education—i.e., an era in which about 5% of the 18- to 22-year-olds entered college. This historical point has significant implications for present policy and practice. In the 1970s, for example, a surge in college dropouts and in failures to complete bachelor's degree programs often was attributed to the United States' discernible expansion toward mass or universal access to higher education; "new learners" and a large cohort of first generation college students were thought to be unfamiliar with or underprepared for the demands and strains of college studies and campus life (Trow, 1970). If this were so, the logical corollary is that one would expect high persistence, cohesion, and degree completion in an era where only a small percentage of the 18-year-olds enrolled in college. Consider, then, some preliminary data and research strategies which might cast doubt on our nostalgia for "going to college" at the turn of the century.

Although we have reasonably comprehensive data on total enrollments for institutions between 1880 and 1910, there is scant research on retention and attrition within campuses. Possibly the best case study deals with Harvard, thanks to Harris' (1970) monumental work of historical statistics, *The Economics of Harvard.* Yet even this "best case" is suspect. This is so because

of the peculiar strategy which Harris used to estimate Harvard College retention patterns from 1803 to 1951: namely, within a given college year, one calculates a percentage based on a ratio of seniors to freshmen. By this measure, the four-year retention in Harvard College for our period of analysis was estimated by Harris as follows (p. 118):

1890	86%
1900	62%
1910	48%
1916	62%

These annual percentages, coupled with the trend of steady and severe rate of decline from 1890 to 1910, tend to support my earlier hypothesis about relatively high attrition even in an era of scarce or elite access to higher education. The sad but true research fact, however, is that Harris rushed to judgement without telling much. His measure is flawed because there is danger in constructing the retention ratio from two different academic classes *within* the same academic year. Accuracy (or, at least, closer approximations of accuracy) require that one analyze the same class at different times. Harris' retention estimates easily could be distorted if there were an administrative policy which called for annually expanding the size of the entering freshman class over several years. Certainly this phenomenon is possible if one looks at Harris' estimates from 1890 to 1910. Indeed, a check of other sources reveals that Harvard's President Eliot did favor larger enrollments and entering classes in the early 1900s. The strange twist is that Harris himself acknowledged the weakness of his own proposed measure with incredible understatement: "To some extent the results are influenced by shifts in the rate of enrollment. When the rise is very rapid, the ratio of seniors to freshmen tends to be small" (p. 119). His own retention estimate for 1803 shows a percentage of 107%—illogical yet statistically possible because the new entering freshman class was very small in size.

Harris did provide a second research strategy: "Another approach is to compare enrollment and degrees granted. A large ratio of degrees to enrollment suggests a high survival rate and, presumably, smart admissions policies" (p. 119). This is an improvement over his first measure—yet still unsatisfactory. Its weakness is that it provides no snapshot of the year-by-year college enrollment pattern. When does dropping out take place? At the end of the freshman year or at the end of the junior year? What about seniors who do not earn degrees?

Given these problems, my research project offers another approach for the historical study of retention and attrition. The annual catalogues for Harvard, Amherst College, The College of William and Mary, the University of

Kentucky, and Transylvania University were used to identify class-by-class enrollment summaries for each year from 1880 to 1910. These annual summaries in turn were assembled so as to track a particular class (i.e., an entering group who start together as freshmen) over a four year period. The algorithm for charting the size and path of one group through the catalogues is illustrated by the following depiction for the Class of 1903:

Freshman (enter Fall 1899) data published in 1900–01 catalogue
Sophomore (as of Fall 1900) data published in 1901–02 catalogue
Junior (as of Fall 1901) data published in 1902–03 catalogue
Senior (as of Fall 1902) data published in 1903–04 catalogue
Bachelor's Degree Recipients (conferred June 1903) published in 1903–04 catalogue

This strategy is attractive because it acknowledges the distinct identity and passage of a particular class from freshman year through senior year and commencement. Instead of merely presenting the complete annual summaries and retention ratios for each institution, the concern here is with some methodological comments and key findings.

PATTERNS AND PATHS: GRAPHIC DEPICTIONS OF RETENTION

The benefit of this research approach is that one can use the statistics to compose a graphic depiction for the collegiate career of each class; i.e., it is a research approach that truly is committed to the study of collective behavior, rather than just aggregate behavior. For example, the University of Kentucky's Class of 1907 entered in Fall 1903 and presents the following statistical profile, with the percentage of the original freshman class which persisted into a particular year listed in parentheses:

Freshman	*Sophomore*	*Junior*	*Senior*	*Bachelor's Degrees*
124	115	81	67	64
(100%)	(93%)	(65%)	(54%)	(52%)

The class path then can be presented as a graphic (Figure 1). One can check the pattern of each class for consistency or fluctuation over several years. If, for example, a particular college shows year after year a similar dropout rate at the end of the freshman year, the researcher is alerted to look for circumstances endemic to the policies, structure, administration, or culture of the institution which possibly promotes this recurrent, regular pattern.

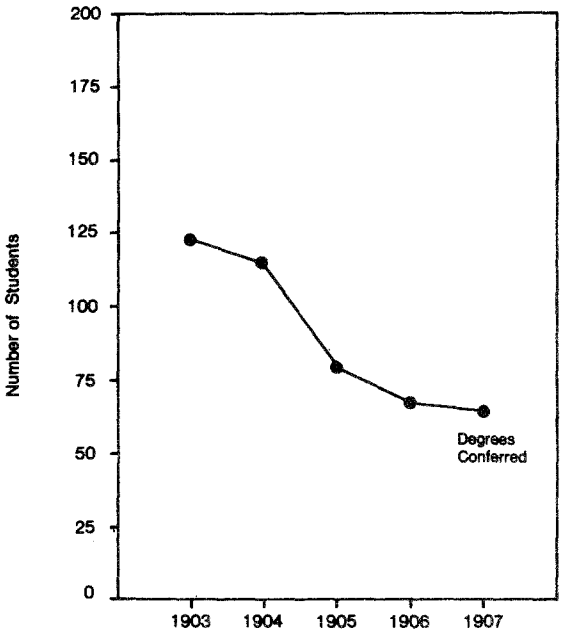

FIG. 1. Annual class enrollment summaries and bachelor's degrees conferred for the undergraduate class of 1907 at Kentucky State College, fall 1903 to June 1907.

INSTITUTIONAL PROFILES: SOME KEY FINDINGS

Although much of the research literature on the history of higher education for the period 1880 to 1910 presents generalizations about "going to college," the statistical profiles and graphics indicate substantial differences among institutions in matters of retention and graduation. And there is evidence of striking differences within an institution over time. Key findings for each campus are summarized below.

Transylvania University. Although Transylvania was one of the more successful colleges in the South, over a 30-year period its liberal arts sector repeatedly displayed the same alarming pattern: a freshman attrition rate of approximately 50%. Seldom did more than 10% of an entering freshman class persist to receive bachelor's degrees four years later.

The College of William and Mary. The College of William and Mary's yearbooks and albums of the early 1900s ascribed wholeheartedly to the

structure and ceremonies of the four-year bachelor of arts curriculum and college experience. The enrollment profiles, however, show that a typical entering class had fairly high retention after the freshman year, followed by an attrition rate of more than 50% after the sophomore year. In the early 1900s only a handful of bachelor's degrees were awarded each June. Analysis of memoirs and literary sources indicate that the attrition pattern was not due to low academic performance; rather, most William and Mary students received state scholarships, which obligated them to teach for two years in the Commonwealth's public schools. An undergraduate could complete the teaching certificate (License of Instruction) after two years—hence, the massive departure at the end of the sophomore year. A relatively small percentage of the students who left to fulfill two years' teaching obligation ultimately returned to college to complete the bachelor's degree. Again, the striking social fact is that little in the College's structure, songs, or rituals acknowledged this predictable and logical pattern of sophomore attrition.

Amherst College. In the 1880s and 1890s, Amherst College's statistical profiles tend to be congruent with the image of the cohesive college class which studied together and graduated after four years. Persistence rates into the senior year repeatedly were between 75% and 90%. This pattern breaks down dramatically and steadily after 1900 and consistently hovers around 50% to 60% until 1910. The contrasts between 1885 and 1905, for example, are sufficiently sharp and sustained to warrant close inspection of events in the student subculture or in the College's academic policies to explain the changes in organizational patterns of life.

University of Kentucky. Originally known as Kentucky State College, this public institution was located in Lexington—the same city as historic Transylvania University. The four-year persistence rates of the new state college ascended gradually from about 30% to 40% in the 1890s to 55% to 70% by 1910. An interesting addendum to Axtell's (1971) notes on the inflated claims of state university advocates is that Kentucky State College enrollments of 1904–05 were still lower than those for such allegedly "small" private colleges as Amherst and Transylvania.

Harvard College. Analysis was confined to Harvard College within Harvard University. Contrary to Harris' observations of mild alarm about freshmen dropouts around 1910, the statistical profiles indicate a relatively healthy senior retention rate of about 65% to 75%. Perhaps the most important message from the Harvard College summaries is the warning about careless analytic assumptions; i.e., the tendency to assume that a student who leaves before four years has "dropped out" (or transferred to another campus). Harvard of the early 1900s derails this ploy, as many Harvard undergraduates completed the bachelor's degree in three years. The weakness of summary class tracking, then, is its inability to distinguish such exceptions. An irony

is that for many years at Harvard College there were *more* bachelor's degrees being awarded than there were members of the senior class!

CONCLUSION: THE NEED FOR COHORT TRACKING

The research strategy that relies on annual class enrollment summaries represents a substantial improvement in depictions and estimates of retention and degree completion for a college. The foibles mentioned in the Harvard case above, however, indicate that one can gain a more accurate and sophisticated measure by employing a research strategy that is admittedly difficult and time-consuming—cohort tracking. In this method, the researcher shuns annual class summaries in favor of following each student, name-by-name, over a four or five year period. To illustrate the increased precision of individualized cohort tracking as distinguished from reliance on class summaries, let us return to the Class of 1907 statistical profile presented above for the University of Kentucky (see also Figure 1). This, in turn, is juxtaposed with the fresh data based on name-by-name cohort tracking for the same University of Kentucky class:

	Freshman	*Sophomore*	*Junior*	*Senior*	*Bachelor's Degrees*
Class Summary Method	124 (100%)	115 (93%)	81 (65%)	67 (54%)	64 (52%)
Individual Cohort Tracking	116 (100%)	68 (59%)	41 (36%)	34 (30%)	34 (30%)

Using the same format as Figure 1, the comparative graphics are presented in Figure 2. It is important to note that neither profile is "wrong." The University *did* confer 64 bachelor's degrees in June 1907—but only 34 (or 53%) were conferred to members of the freshman class which entered together in Fall 1903. At the very least, the differences between the two profiles suggest that there must have been considerable transferring and returning of students at American colleges and universities in the early 1900s, despite the conventional wisdom about the cohesive, four-year college experience. Nor is this analysis of one cohort at Kentucky between 1903 and 1907 an isolated or exceptional example. Individual cohort tracking for six other entering classes at Kentucky State College showed equally dramatic differences in estimates of retention and graduation masked by reliance on class summaries.

In conclusion, the use of increasingly sophisticated strategies for the historical study of retention and attrition is necessary for linking the past with

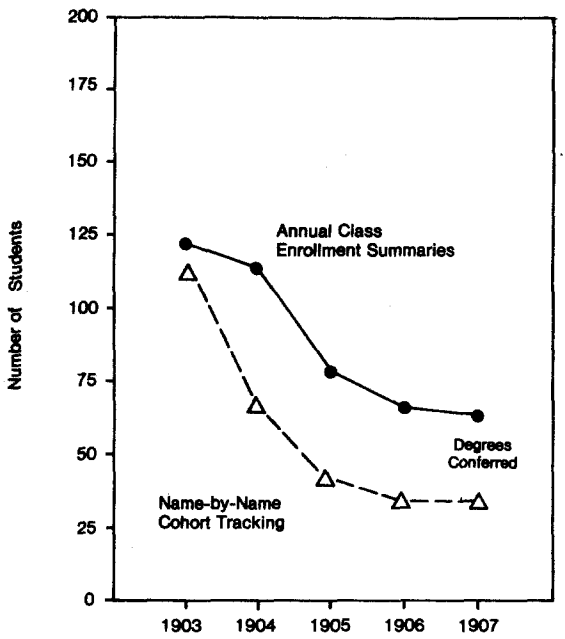

FIG. 2. Comparison of annual class enrollment summaries and name-by-name student cohort tracking for the undergraduate class of 1907 at Kentucky State College, fall 1903 to June 1907.

the present. Today the study of student attrition and retention has attracted some of the most able researchers in higher education, including Pascarella, Tinto, Terenzini, Bean, Lenning, Beal, and Chapman (Pascarella, 1982). Yet it is a topic which can be enhanced by sound historical data and analyses. To illustrate this fusion, let us turn from quantitative methods to the more traditional historical sources: magazine articles from the late nineteenth and early twentieth centuries. During these decades going to college was a source of prestige—an experience which acquired a strong mystique among the American public. Readers of such nationally circulated periodicals as *Century, Atlantic Monthly, Harper's, McClure's,* and *Scribner's* were treated every fortnight to "inside stories" that provided glimpses of student life at Amherst, Wellesley, Stanford, Princeton, Yale, or Harvard. The drawings and photographs of undergraduate activities, athletic contests, commencement ceremonies, dormitory life, and class meetings in lecture halls fed readers' curiosity about what was going on inside the campus walls.

Almost a century later the researchers and analysts of higher education find themselves once again in about the same situation as the curious read-

ers of 1900. The selected case studies of enrollment, retention, attrition, and degree completion statistics merely scratch the institutional surface. They remind us that we still do not know a great deal about the patterns of life and the collegiate careers of American students between 1880 and 1910. The question that persists and that unites the historian and the statistician, whether for 1880 or 1980, is: "Just what was going on inside the campus?"

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REFERENCES

Axtell, J. (1971). The death of the liberal arts college. *History of Education Quarterly* 9: 339–353.

Bowen, H., and Minter, J. (1976). *Private Higher Education: Second Annual Report on Financial and Educational Trends in the Private Sector of American Higher Education.* Washington, D.C.: Association of American Colleges.

Canby, H. S. (1936). *Alma Mater: The Gothic Age of the American College.* New York: Farrar and Rinehart.

Dickmeyer, N., and Hughes, S. (1979). *Self-Assessment of Financial Condition: A Preliminary Edition of a Workbook for Small Independent Institutions.* Washington, D.C.: National Association of College and University Business Officers and the American Council on Education.

Fincher, C. (1982). Ratios, rates, and ratiocination. *Research in Higher Education* 17: 375–378.

Gauss, C. (1958). How good were the good old times? (1929). *In* A. C. Spectorsky (Ed.), *The College Years.* New York: Hawthorn, pp. 81–88.

Harris, S. (1970). *The Economics of Harvard.* New York: McGraw Hill, 1970.

Jensen, O. (1974). *A College Album.* New York: American Heritage.

Lunney, G. (1979). About that data base which is hiding in the closet. Paper presented at the Southern Association for Institutional Research Conference, October 1979.

Mayhew, L. (1980). *Surviving the Eighties: Strategies and Procedures for Solving Fiscal and Enrollment Problems.* San Francisco: Jossey-Bass.

Pascarella, E. (Ed.) (1982). *Studying Student Attrition.* San Francisco: Jossey-Bass.

Santayana, G. (1982). A glimpse of Yale. *Harvard Monthly* 15: 89–97.

Slosson, E. (1910). *Great American Universities.* New York: Macmillan.

Trow, M. (1970). Reflections on the transition from mass to universal higher education. *Daedalus* 99: 1–42.

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