

HIGHER EDUCATION IN PENNSYLVANIA

Analysis of Problems with Proposals

**Commonwealth of Pennsylvania
Joint State Government Commission
Advisory Panel
January 2, 1959**

JOINT STATE GOVERNMENT COMMISSION

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SUMMARY OF FINDINGS AND RECOMMENDATIONS

FINDINGS

The Advisory Panel of the Joint State Government Commission has found that:

1. A crisis in higher education of major proportions is facing the Commonwealth of Pennsylvania.

-If present enrollment trends continue, by 1970 total enrollments in the Commonwealth's institutions of higher education will have increased 114 per cent.

-These trends do not take into account the fact that only half of Pennsylvania's youth, qualified for a college education, are going to college.

-If steps are taken to increase motivation and solve the problem of financing the education of students now not able to pay for higher education, the increase in total enrollment will be at least 158 per cent.

-If Pennsylvania is to progress and if the nation is to meet the challenge of international Communism, which is moving toward maximum development of human resources, higher education must be expanded to provide greater numbers of more highly trained people.

2. Pennsylvania, although strong in many aspects of higher education, is not a leader among the states. Pennsylvania:

-Ranks 27th in the percentage of its population in the age group of 18 to 21 attending institutions of higher education. In 1930, it ranked 23rd; in 1910, 15th.

-Ranks 32nd in the total amount of annual income per student received from all sources by colleges and universities.

-Ranks 46th in the amount of annual income received from Commonwealth appropriations for higher education.

-Ranks 48th in the capacity to absorb increased enrollment into the present physical facilities of its colleges and universities.

3. All of the basic facilities of colleges and universities, faculty, library, physical plant, and administration, must be greatly expanded.

Under present methods of teaching and administration and within the present academic calendar, these needs may be predicted:

-More than 20,000 new faculty members will be needed for the present curricula under the present methods of teaching; but at best only one-half of this need can be met. To obtain even this portion of the requirements, a substantial increase in faculty salaries must occur.

-College and university libraries must be expanded; over six million more volumes are needed.

-In order to free faculty from nonteaching duties and in order to meet the complex problem of managing a greatly expanded system of higher education, a disproportionate increase in administrative staff will be required.

-Nearly 18.5 million square feet of new physical plant for teaching, research and administration plus 13 million square feet of dormitory space will be required.

4. To meet these needs, expenditures of higher education in the Commonwealth must increase.

-Operating expenditures per year must increase two and a half to three times to \$550 million a year.

-New capital plant investment of nearly \$1 billion will be required by 1970, \$2 million of which will be self-liquidating.

5. An operating deficit of more than \$228 million a year is in prospect if the present pattern of income remains the same.

RECOMMENDATIONS

The Advisory Panel believes that, if thoughtful but prompt action is taken, the crisis can be met. Success depends on the willingness of all elements in the educational process to participate in a basic reappraisal of their part in higher education and to agree to changes in attitude and methods wherever necessary. The Panel makes the following proposals:

1. The secondary schools throughout the Commonwealth must:

- Improve the processes through which able students are identified and motivated to go on to college and through which those students without sufficient motivation or ability are led in another direction.
- Encourage the development of large comprehensive or differentiated high schools where adequate curricula can be offered to both the student preparing for college and the student who chooses another direction.
- Intensify the college preparatory curriculum so as to relieve higher education from the task of teaching basic skills of a secondary school level.
- Develop work habits in the future college student which will enable him to be significantly more self-reliant in the obtaining of learning.

2. The parents of young men and women qualified for college training must:

-Assume a far larger share of the costs of higher education by paying higher tuition or by going into debt, even though this may require a basic change in their values.

-Help instill in their children the value of intensive effort and self-reliance.

3. The student must assume a greater personal responsibility for his own education:

-By being more self-reliant in his search for higher learning.

-By a willingness to pledge part of his future earnings to support the costs of education.

4. The alumni must be made to recognize the obligations they owe the colleges and universities and substantially increase their present meagre level of support.

5. The business community should be increasingly encouraged to recognize its stake in higher education and to increase its financial support.

6. The colleges and universities and their faculties have the basic responsibility to increase their effectiveness. They must:

-Reduce the student load by insisting upon standards for admission which eliminate the unqualified student.

-Increase faculty salaries substantially.

-Take direct measures to attract more men and women into teaching careers in higher education.

-Increase the effectiveness of the faculty by the elimination of unnecessary courses, by placing more reliance on self-education by the student; and by relief of the faculty from nonteaching responsibilities.

-Introduce and accept tested techniques of administration and management.

-Improve the utilization of the physical plant by better scheduling of classes and by extending the daily and weekly use of facilities.

-Extend the academic calendar so that institutions operate throughout the year. (This step alone can reduce capital plant requirements by 40 per cent)

-Develop in all parts of the institution a spirit of willingness to accept changes. Create a continuing staff group drawn from the faculty with the principal duty of making appraisals of curricula and teaching methods.

7. The Commonwealth government should increase direct support to higher education to a substantially higher per student rate than that now in effect.

8. The foregoing proposals, if adopted, will reduce substantially the financial gap between income and expense. The Panel proposes that the remainder of the difference be made up by:

-Increases in tuition of an amount large enough to eliminate the deficit, coupled with

-An extensive program of student loans, probably supported by the government.

9. The expansion of facilities for higher education should occur where possible at existing institutions.

-A study of the plans of existing institutions should be made at once.

-Universities should be strengthened, but no new universities created. A council of the presidents of the four state-aided universities should be established to insure coordination of programs.

-Steps should be taken to change the character of the State Teachers Colleges to full liberal arts colleges and thus relieve them of their present single-purpose aim of preparing teachers, a function that can be performed better through graduate education at universities.

-Additional expansion needed should occur at new junior colleges, established on a regional basis and financed partly by the Commonwealth, partly by the region, and partly by the students. The junior college, in addition to providing facilities for increased college enrollment, should offer programs for many young people who cannot profit adequately from college training.

10. In implementing these recommendations, improvement in quality of education should be stressed as well as ability to teach greater numbers.

CHAPTER I

Reappraisal of Higher Education

FOREWORD

The Joint State Government Commission was authorized by House Resolution Number 107, Session of 1957, to submit to the General Assembly of the Commonwealth of Pennsylvania by January 1, 1959, its findings and recommendations regarding the problems of higher education in the Commonwealth of Pennsylvania. The Resolution is to be found in Appendix A. It states:

The problem of equal opportunity of all for higher education in the Commonwealth of Pennsylvania has become a matter of widespread concern, particularly the question of state subsidization of qualified secondary school graduates without adequate financial means to continue their schooling at the college level . . . The participation of the State in this field involves broad questions of financial feasibility, revenues sources, adequate administration and overall effectiveness.

The Joint State Government Commission set up an Advisory Panel to study these problems. The Panel has concerned itself only with the problems of higher education and has refrained from attempting a broad study of elementary and secondary education. Although such a study would be of great value particularly insofar as these levels of education are related to higher education, it is beyond the scope and resources of the Panel.

CRISIS IN HIGHER

EDUCATION

The problems of higher education are acute. They have become so, first, because of the rapid increase in population, and, second,

because of the threat of international communism.

On the domestic side, enrollments in institutions of higher education are higher than ever before in our history because of the continued growth of our population and because of the rapidly increasing demand of our economy for greater numbers of more highly educated people.

Our attention is now sharply focused on the problem of higher education because of the phenomenal rise of the birth rate in the past eighteen years. Nor will this be a temporary situation. Both the size of the college-age population and the per cent attending college are expected to continue to grow.

On the international scene, our aims are to maintain the superiority of the free world's military and economic defenses and to retain the confidence of uncommitted peoples. Now we find that education is involved as an important part of national policy and indeed of national survival.

Many groups of our most distinguished citizens have spoken strongly of the challenge we face. The report on the American economy by the Rockefeller Brothers Fund¹ traces the great economic progress

¹ The Challenge to America: Its Economic and Social Aspects, Special Studies Project, April 20, 1958.

our country has experienced and points out the kinds of problems faced in a growth economy. Significantly, one of the basic recommendations to insure continued progress in the economic and social aspects of the contemporary scene is for a doubling of expenditures for education by 1967.

THE CHALLENGE The President's Committee on Education Beyond the High
OF INTERNATIONAL
COMMUNISM School affirmed that:

America would be heedless if she closed her eyes to the dramatic strides being taken by the Soviet Union in post-high school education, particularly in the development of scientists, engineers, and technicians . . . the challenge of the next 20 years will require leaders not only in science and engineering and in business and industry, but in government and politics, in foreign affairs and diplomacy, in education and civic affairs. World peace and the survival of mankind may well depend on the way in which we educate the citizens and leaders of tomorrow.²

The Economic Report of the President states that "new and stern challenges to the security of the free world, both immediate and long-run, call for greater efforts to strengthen the technical base of our military preparedness and to improve the quality of our school system." However, it stresses that we can best achieve our aims "not by distorting the Nation's scientific programs and educational system, but by promoting their rapid growth and improvement in needed

² Second Report to the President, Washington, D. C., July 1957; p. 1

directions, without sacrificing either the balance necessary for the rounded life in a free society or the capacity to meet new contingencies that may arise."³

A Report on Higher Education in the Soviet Union by a group of American educators notes that:

. . . the most significant aspect of higher education in the Soviet Union is the prestige it enjoys and the consequent support it can command. It is held in the highest regard by all portions of society . . . Faculties enjoy prestige second to no other professional group in the Soviet Union. Higher education is viewed by the State as the principal method of channeling the abilities of the nation.⁴

The report points out that support of higher education, both in money and in human effort, is given unstintingly. Faculty salaries are among the highest in the nation. Special payments and benefits recognize scholarship and those who are responsible for it. Physical plant for higher education is rapidly being acquired. Evidence of careful planning to maximize all resources is found in the extensive opportunities for women, relationships with industry, permitting individuals released time from work at full pay for examinations and study, and the remarkably extensive libraries.

There is evidence that Red China, emulating the Soviet Union, is moving rapidly in developing a system of higher education.

³ Economic Report of the President, transmitted to the Congress January 20, 1958, United States Government Printing Office; Washington, 1958, p. 60-61.

⁴ A Report on Higher Education in the Soviet Union, University of Pittsburgh Press, 1958, p. 15. ✓

International Communism attaches a high value to higher education because it is regarded as a vehicle not only for the improvement of communistic society, but also as a necessity in communism's drive to assume world leadership.

If one seeks to be competitive, here is a real challenge. If one is fearful of the predominance of the Soviet Union, here, indeed is cause for fear. To urge that this is utilitarian instruction -- that it is more training than it is education -- does not minimize the challenge; indeed in the short run it may increase the reason for fear.⁵

Alvin Eurich strongly urges that we emulate the attitude toward education in the Soviet Union, not the educational system itself.

Instead of urging a blind imitation of the Russian system of schooling, however, we should realize that Soviet methods and goals in education are entirely unsuitable for a country with democratic ideals. Yet we can learn from the Russian attitude, which gives top priority to education not only in discussion but in action.⁶

The Report on Higher Education in the Soviet Union verifies Eurich's contention, pointing out that although the Soviet's view of the importance of higher education is admirable, its product will be "probably on the average less intellectually creative than that which an institutionally dynamic and individually creative society requires in the long run."⁷

⁵ Ibid., p. 15.

⁶ Alvin C. Eurich, "Schools Need More Than Money". The Nation, May 10, 1958, p. 405.

⁷ Report on Higher Education in the Soviet Union, p. 32

**THE RANK OF THE
COMMONWEALTH**

Pennsylvania faces the problems of higher education from a less than enviable position. There are, however, many aspects of educational resources which are praiseworthy and which provide an excellent base from which to go forward in meeting the crisis ahead. Many of the private schools are strongly supported by their sponsoring churches providing excellent institutions of higher education. The government of the Commonwealth, in both its executive and legislative branches, is aware of and concerned about these problems as evidenced by continuing study of them during the past several years. Our technique of state-supported universities retains the advantages of private control. Some of our Pennsylvania colleges and universities are among the nation's finest. But as a whole, the Commonwealth is not a leader among the other states in measures of its educational programs. Among the states, Pennsylvania:

- Ranks 27th in the percentage of its population in the age group of 18 to 21 attending institutions of higher education.
- Ranks 48th in the capacity to absorb increased enrollment into the present physical facilities of colleges and universities.

It may be noted that Pennsylvania:

- Ranks 6th in the amount of annual income per student received by the college or university directly from the students themselves through tuition and fees.
- Ranks 14th in the amount of annual income per student received from gifts or endowments.

But, despite these favorable rankings, Pennsylvania:

- Ranks only 32nd in the total amount of annual income per student

received from all sources.

This low ranking is due to the fact that Pennsylvania:

- Ranks 43rd in the amount of annual income per student received from local governments.
- Ranks 46th in the amount of annual income received from the state government.
- Ranks 39th in the percentage of the total state budget being spent annually for higher education.
- Ranks 44th in the amount of money per capita spent each year by the state on higher education.
- Ranks 45th in the amount of annual state aid expressed as a percentage of income received by individual citizens of the state.⁸

**BASIC
REAPPRAISAL**

The crisis in higher education in Pennsylvania and in America cannot be met by minor modification of the existing structure. It is of too great a magnitude to hope that an adjustment here and an alteration there will permit us to solve our problems. There must be a fundamental reappraisal of our entire system of higher education and a thorough-going analysis of its problems.

To achieve adequate results, all elements in the educational process must be willing to reassess their respective roles, identify problems, and seek solutions, even though those solutions may require sweeping changes in existing customs, habits, or methods.

⁸ These statistics were taken from pre-publication work sheets of the U. S. Office of Education, Biennial Survey of Education.

The faculties of higher education must consider their role in the process. Are they primarily the teachers and the research workers, or should they devote time and talent to administrative details and participate as individuals or as committee members in the making of relatively trivial administrative policy? The curriculum structure in our colleges and universities needs a thorough-going review by the faculties. What are the real objectives of the courses being taught today? Are these objectives valid, and, if so, are the courses meeting them? Do unnecessary or overlapping courses exist? Are courses too highly specialized? Is enough emphasis being given to self-education by the students, or are the faculty spoon-feeding their charges? Is there a willingness to accept change, particularly as regards revision of teaching methodology? What should be the proper balance in a faculty between teaching and research? What is the faculty's responsibility for applying knowledge as well as for imparting it? These are some basic questions to be answered by the group best qualified to answer them -- the faculty.

College and university administrators must re-examine their place in an institution of higher learning. Are they striving to create the most effective environment in which education in its broadest sense can take place or do they exist to create paperwork and perpetuate an ever-expanding bureaucracy? What can the administrator do to free the faculty of distracting responsibilities and to marshal the resources needed for efficient and successful education?

Parents must assess anew their economic responsibility for providing higher education for their children. Is a new car more or less important than the future of a son or daughter? How great a sacrifice should a family make to meet its responsibilities for financing a college and professional education? The President's Committee on Education Beyond the High School dramatized this problem when they pointed out that in 1955 the American people were spending annually over \$85 per capita for tobacco and alcoholic beverages; \$79 for recreation; and \$87 for automobiles. In 1956, the people of Pennsylvania spent about \$24.50 per capita on higher education.

The student, himself, must examine his place in higher education. Why does he wish to go to college? What effort is he willing to extend to prepare himself before college and to achieve success once he is in? What personal sacrifices is he willing to make as a student and later as an alumnus?

The secondary school, its faculty and its counselors, must reassess its role. How can the traditional high school curriculum be changed to make subsequent collegiate training most effective? What can be done to motivate the boy or girl who is qualified to strive for higher education; and, on the other hand, what steps should be taken to redirect the unqualified who are planning collegiate training because of social or parental pressures?

The business corporation must further examine its responsibilities to higher education. Is the university an institution basic to the welfare of the corporation or is it outside the interests of corporate enterprise? If

the former, what can the corporation do to help meet the crisis?

The government must reappraise its role not only as it may affect state-owned or state-aided institutions, but also as it may affect the large private university or the small private liberal arts college.

In the report that follows, an appraisal is made of the quantitative and financial magnitude of the problems facing higher education in the Commonwealth of Pennsylvania. An assessment of these problems is made and directions toward their solutions are suggested. However, as it will become clear, these problems are not to be solved by tinkering. We must re-examine and, if necessary, rebuild the basic structure. Although the Advisory Panel is reporting to the government of the Commonwealth, it is not within the province of the government alone to supervise and finance the rebuilding. We cannot say too emphatically that this must be the responsibility of all who are concerned with higher education.

CHAPTER II

Estimates of Demand for Higher Education in Pennsylvania,

1958 Through 1970

The demand for higher education in the Commonwealth of Pennsylvania over the coming decade and the seriousness of the challenge have received great attention in recent years. The growth in the demand for college and university education is attributed to a combination of the following factors:

1. Increase in the size of the college-age population,
2. Increase in the proportion of high school graduates within the college-age population.
3. Increase in the proportion of high school graduates going on into higher education, and
4. Increase in the proportion of college graduates who subsequently undertake graduate and professional school programs.

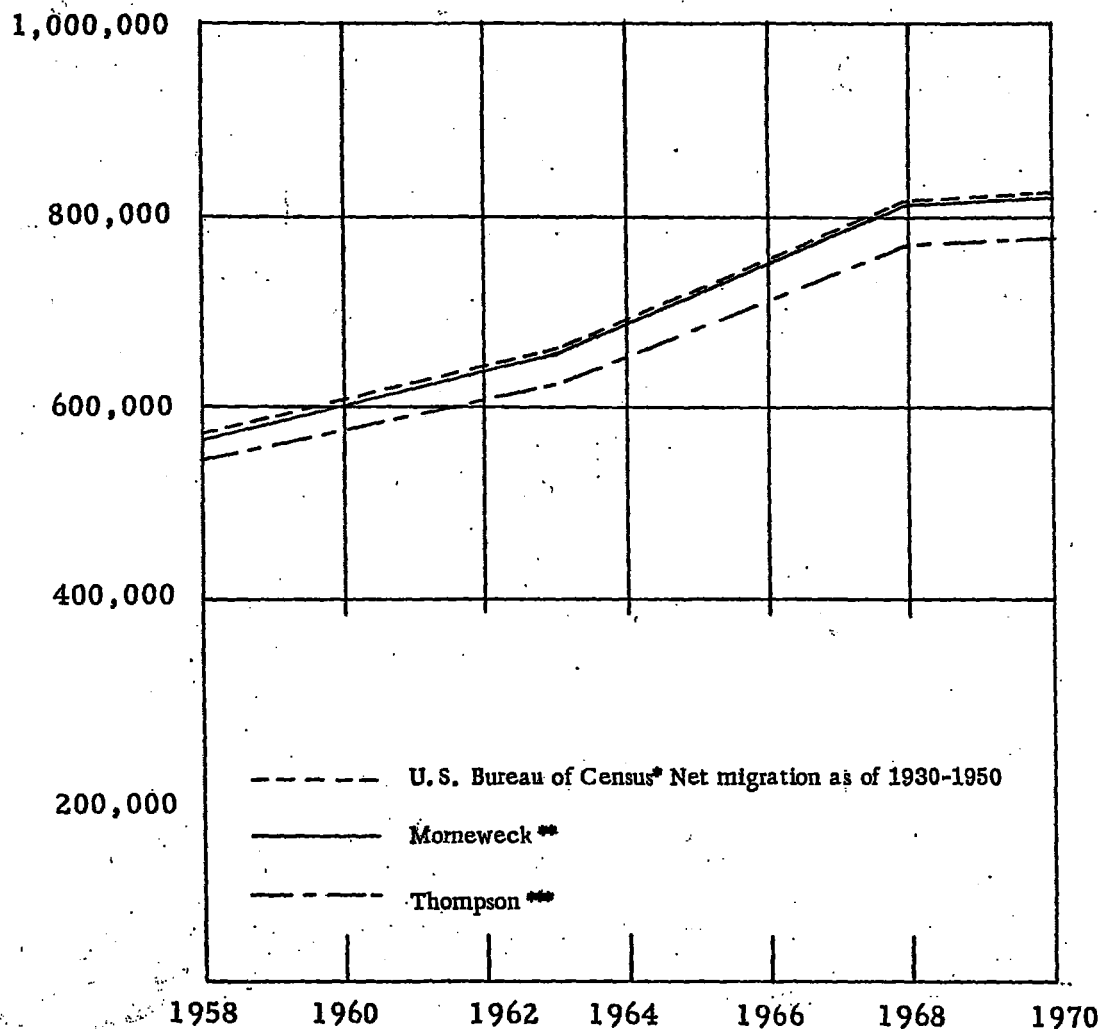
This chapter examines growth trends and factors in each of the four categories, appraises the 1970 enrollment projections made by several studies of enrollment growth, and presents the estimate of the Advisory Panel.

INCREASE IN POPULATION OF COLLEGE AGE

The growth of the college-age population of Pennsylvania from 1958 to 1970 is estimated at 40 to 45 per cent, a dramatic increase in an age group which had actually declined in size in the previous 12-year period. However, the projections of the size of this age group in 1970 vary as shown in Exhibit 1. Our review of the available projections supports the estimate of 825,000 made by the Department of Public Instruction

EXHIBIT 1

ESTIMATES OF FUTURE PENNSYLVANIA POPULATION AGE 18-21 YEARS



* U. S. Bureau of the Census, Illustrative Projections of the College-Age Population by State: 1958 to 1973, Series P-25, No. 132, 1956, as modified by A. Ciocco and M. Patno, University of Pittsburgh.

** The Enrollment Picture for the Decade Ahead, Research Studies and Reports Series No. 3, Carl B. Morneweck, Director of Research, Department of Public Instruction, Commonwealth of Pennsylvania, March 1958. This projection to 1968 was extended to 1970 by the Advisory Panel.

*** R. B. Thompson, The Problem of Rising College Enrollments. The College Blue Book, New York, 1957.

See Appendix C, Table 1, for supporting data.

study under the direction of Dr. Carl B. Morneweck. This estimate closely parallels that of the U. S. Bureau of Census although taking a slightly more conservative position. In addition, we should note that the census trend used here is the most conservative of the census estimates reflecting various migration alternatives, i. e., the one assuming the largest migration. We recognize the possibility that Pennsylvania could fall behind other states with a lag in industrial development and a rise in unemployment. In such an event, migration could be even greater than the largest census estimate. A major factor in attracting and holding industry is a continuing supply of persons with advanced training in a wide variety of fields. If the economy is strengthened, industry becomes more vigorous and employment increases, migration will be low, and the population (including those of college age) will be even larger than estimated in this study.

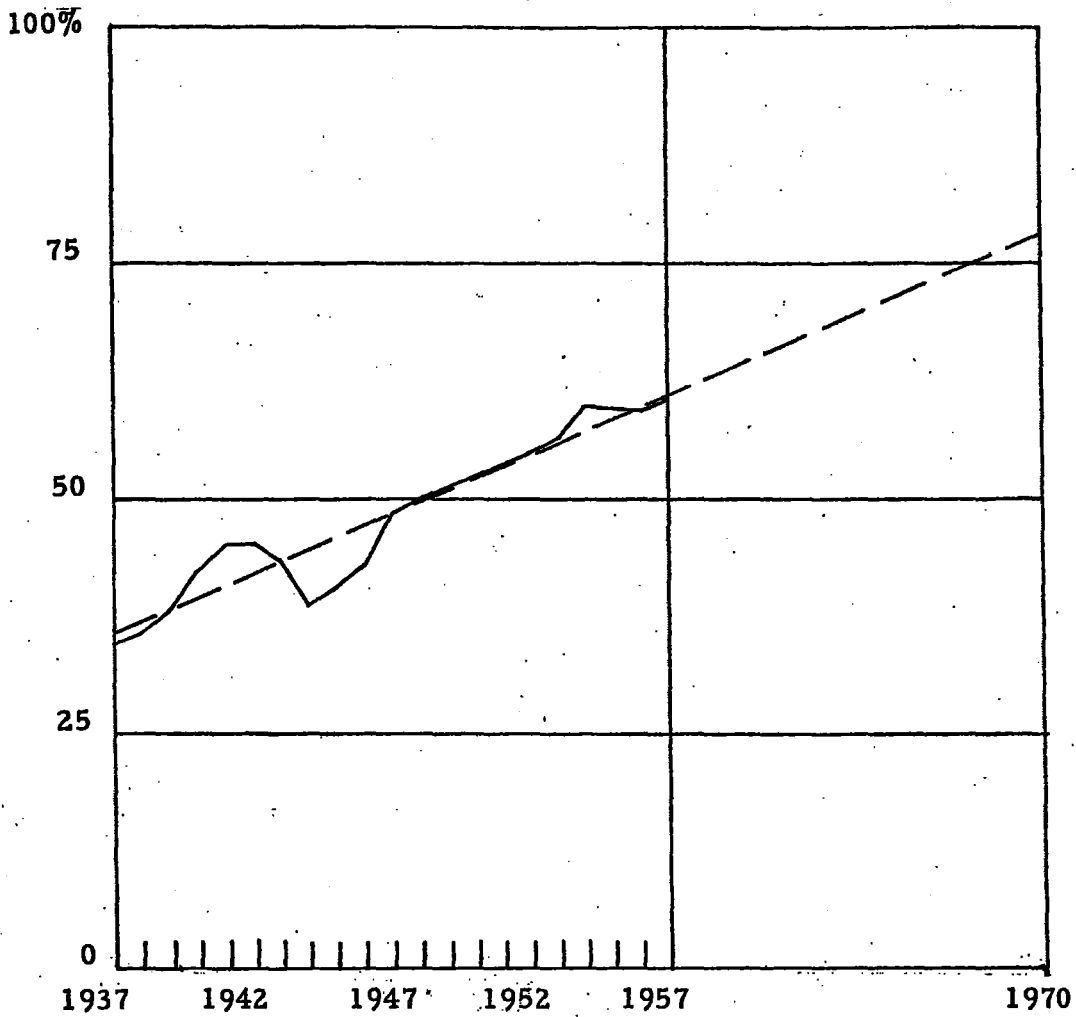
**INCREASE,
IN NUMBER
OF HIGH
SCHOOL
GRADUATES**

The number of students graduating from high school is influenced by several considerations. In the first place, there are larger numbers in the relevant age group; in the second place, and this is the new consideration here, more of those who are in the age bracket actually complete high school education. As Exhibit 2 shows, over the past twenty years the percentage of children enrolling in the first grade who subsequently graduate from high school has risen from 34 per cent to 61 per cent and is expected to reach 77.5 per cent by 1970.

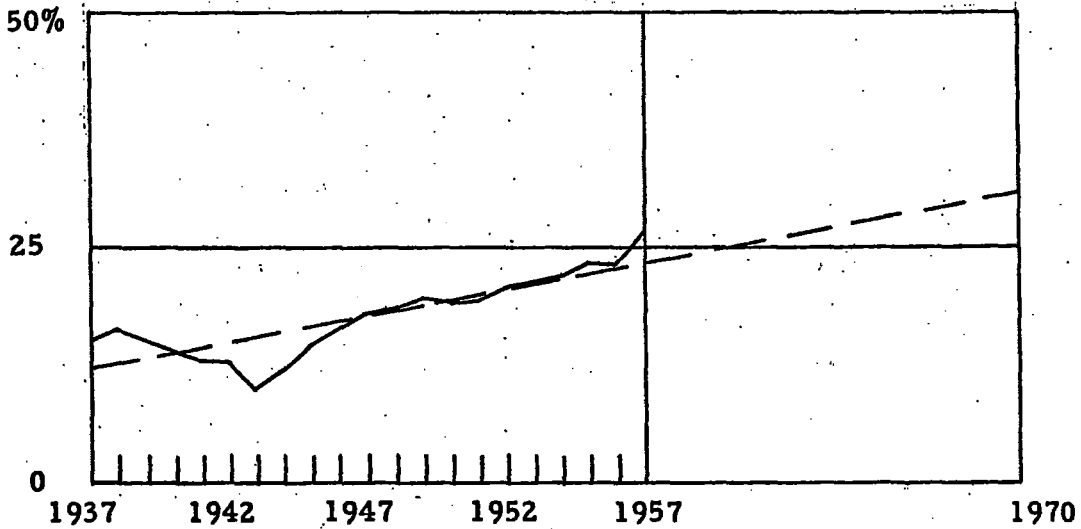
A point which should be emphasized here is that there is an increasing number both of comprehensive and of differentiated high schools and an accompanying increase in the teaching of technical and vocational courses.

EXHIBIT 2

PER CENT OF PUBLIC ELEMENTARY SCHOOL ENROLLEES
GRADUATING FROM HIGH SCHOOL AND ESTIMATED TREND,
PENNSYLVANIA 1937-1970



PER CENT OF PUBLIC HIGH SCHOOL GRADUATES ENTERING
COLLEGES AND ESTIMATED TREND, PENNSYLVANIA
1937-1970



Source: Actual data -- Morneweck, *op. cit.*
Estimated trend -- The Advisory Panel
See Appendix C, Table 2, for supporting data.

This affects both the numbers graduating from high school and the numbers seeking higher education. This will increase the number of students graduating since students with non-professional aspirations will be able to get a good technical training in high school and so will continue in school rather than drop out as soon as legally possible in order to take jobs. Many who receive good technical training will be stimulated to change their career plans and move into science or engineering curricula in universities. In addition, students desiring a college education will be better prepared. Those students who have native ability to qualify for college but who were formerly marginal because of poor preparation will now be admissible. Normally only the heavily populated urban communities will find it feasible to establish comprehensive high schools large enough to specialize in both technical and college preparation subjects. In other communities the establishment of technical and vocational high schools would increase the numbers graduating from high school.

PER CENT OF
HIGH SCHOOL
GRADUATES
SEEKING
HIGHER
EDUCATION

A significant change is occurring in the attitude of high school graduates toward college and university education. This is due to changes in our social setting and to changed expectations of the American people as a result of improved and expanded technology. There are several factors to be considered here. First, the value attached to higher education is gradually increasing. Second, the growth of various kinds of community-oriented institutions will make for a greater geographical proximity of higher education to its clientele and therefore more people will be able to

go. Third, the expected increase in financial aid to education by governments, foundations, and individuals will enable many to go on to institutions of higher learning who do not now do so. Fourth, the need of industry for individuals with higher education is rapidly increasing and this will have a real impact upon the willingness of students to go on to higher education. As is discussed subsequently, these factors are not yet being felt to a marked degree in Pennsylvania, but are given weight in our estimates. Factors of unemployment and lag in industrial development could cause a migration with subsequent reduction in the numbers attending colleges and universities.

The curve of college entrants has risen steadily since the temporary downturn recorded during the early years of World War II. This rise was due in the first place to the influx of veterans and we may speculate that it continued because of economic prosperity, the availability of higher education, and the demand of our economy for persons with a college or university education. That the curve will continue to rise is guaranteed by the growth of the college-age population; this with the addition of the factors discussed above account for the vast increase which we project in this report.

Exhibit 2 also shows that the percentage of high school graduates entering colleges and universities rose from 15 in 1937 to 25 in 1957. It is our estimate that this will have risen to 32 by 1970. It should be noted here that these figures are for public schools only. It is a reasonable assumption that a higher percentage of graduates of private schools go on

to college than do those of public schools. For this reason, this estimate may be regarded as conservative and we feel that when private school graduates are included the figure may reach 35 per cent.

We should also note the growth in number and importance of post-high school institutes and trade schools and also of junior colleges. Evidence suggests that the introduction of intermediate institutes tends to increase the relative number of persons enrolled in all post-high school institutions. Therefore, the establishment of such schools and institutes will probably increase the enrollment pressures on colleges and universities.

INCREASE IN
NUMBER OF
STUDENTS
UNDERTAKING
GRADUATE
AND GRADUATE
PROFESSIONAL
PROGRAMS

The per cent of students enrolled in graduate and graduate professional programs has swung upward more sharply both in total numbers and as a percentage increase than has the enrollment for undergraduates. More significant here than total numbers is the growing length of time an individual remains in the university. Students completing the bachelor's degree and going on to professional schools, such as law, medicine, etc. or to graduate work leading toward the master's and the doctor's degrees spend additional years in the university. Further, more and more programs which were formerly four-year undergraduate programs are now five-year programs. Many engineering schools now have five-year programs and The American Association of Colleges of Pharmacy has prescribed five years as a minimum.

There is an ever-increasing demand for professionally-trained persons and the demand increases more rapidly than the population. The flood of new knowledge in recent years has caused many more fields to require graduate degrees with a tendency to replace the undergraduate professional education with more general or liberal arts education.

Additional education is required in the teaching field; business administration, social work, and other schools throughout the country are increasingly moving to the graduate level.

Industry urgently requires engineers with training beyond the baccalaureate degree, and the scientists with the doctor's degree are in very great demand for research positions in industry and government. One large Pennsylvania corporation has not only recognized the need, it is taking positive action to fill it. At all times fifteen to twenty of its employees are full-time graduate students at a nearby university on full pay and with tuition paid by the corporation. In addition, once a year, this company sends 45 employees to the university for a semester of full-time work toward the master's degree which is later completed in part-time study. Moreover, we must also recognize the enormous need for people with doctoral training to meet the great teacher shortage in colleges and universities. In 1953, 8300 doctors' degrees were awarded. Wolfe stated in 1954 that the total number had doubled since 1940 and should double again by 1970.¹

The increase in graduate students through the years 1900 to 1930 was small. Beginning in the thirties the increase became sharp until now

¹ Dael Wolfe, America's Resources of Specialized Talent, N. Y., Harper and Brothers, 1954, pp. 41 and 44.

graduate students represent approximately 13 per cent of the total student body. Our projections indicate that by 1970 graduate students will make up at least 17 per cent of the total as shown in Exhibit 3. Costs of graduate education are many times those of undergraduate education though they are difficult to measure and vary widely from field to field. A study at a Pennsylvania university indicates that on the average graduate education costs more than twice as much as undergraduate; within the liberal arts, graduate education costs three times as much and for one area of the arts where classes are very small four times as much; costs in the field of medicine are six times as great as those in undergraduate study.²

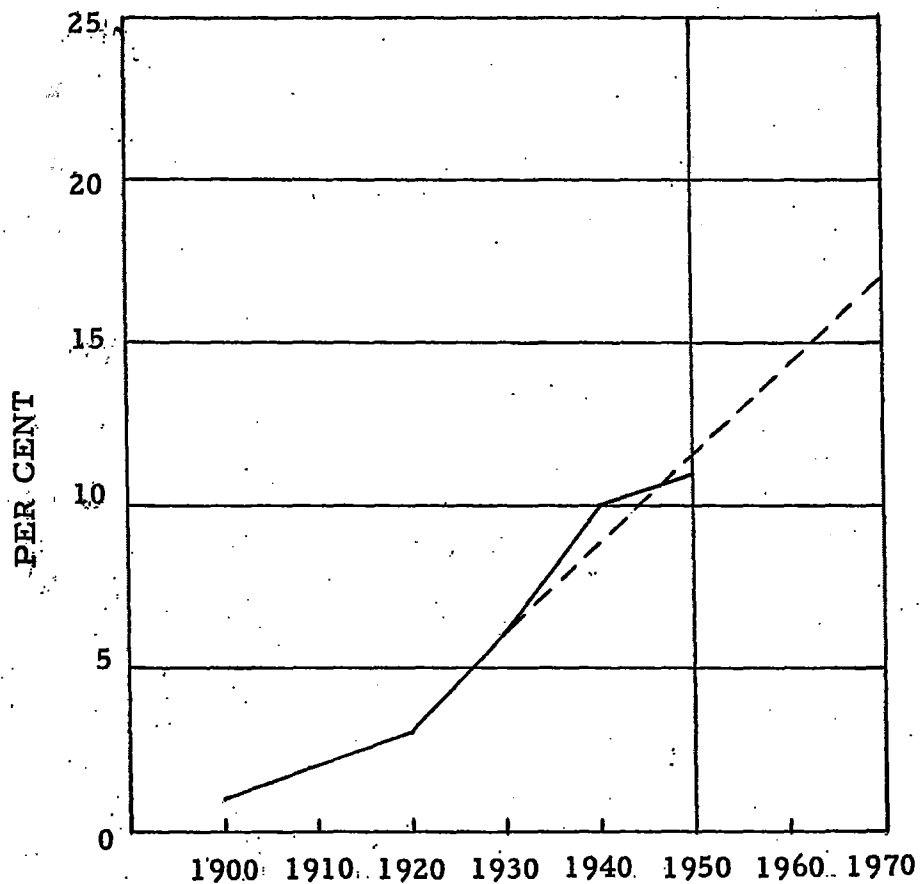
A new factor in the growth of total numbers is the increased number of years students spend at universities for postdoctoral work. Postdoctoral students are by far the most expensive and are much more important than their individual numbers would suggest. Such work provides both practical experience and theoretical research for the holder of an advanced degree. One example is that of the clinical psychologist who, after he receives his doctoral degree, sometimes requires several years postdoctoral experience in an accredited institution. Another is chemistry, others are the behavioral and social sciences for advanced training in such areas as mathematical statistics and experimental methods.

The National Science Foundation in the fiscal year 1957 awarded

² Organization and Methods Division, University of Pittsburgh, unpublished data.

EXHIBIT 3

GRADUATE ENROLLMENT AS A PER CENT OF TOTAL ENROLLMENT IN INSTITUTIONS OF HIGHER EDUCATION AND ESTIMATED TREND, PENNSYLVANIA 1900-1970



Source: Actual Data-Council of State Governments, Higher Education In the Forty-Eight States, A Report of the Governors Conference, 1952.

Estimated Trend - The Advisory Panel

See Appendix C, Table 3, for supporting data.

109 regular postdoctoral fellowships "to provide an opportunity to scientists of proven ability to increase their competence in their own fields and to broaden their experience in related fields"; 55 senior postdoctoral fellowships were awarded to senior established scientists; and, in addition, 100 fellowships were awarded to college science teachers who do not necessarily hold advanced degrees.³ The National Institutes of Health, Public Health Service, last year awarded 500 postdoctoral fellowships, largely in health and related fields.⁴ While these fellowships for work at universities are financed by government agencies, many more are financed by the universities themselves.

There is concurrently greater emphasis being given postdoctoral education in industry and in industry-related research institutes; such work, however, is largely limited to the physical sciences.

Postdoctoral fellows are attracted to universities and research institutes where superior work is in progress and, in turn, their contributions help maintain standards of excellence. The increasing importance of this kind of education in cost, in time, and in contribution to scholarship demands our attention. The trend toward postdoctoral education is a new one but already is assuming a major role. We believe that the leading

³ U. S. National Science Foundation, Seventh Annual Report, 1957, pp. 68-69.

⁴ U. S. Public Health Service, Grants and Fellowships Awarded by the National Institutes of Health, 1958, pp. 23-58.

universities in Pennsylvania should pioneer in this field just as Johns Hopkins University pioneered in graduate education in the 1870's.

INCREASE IN PART-TIME AND OTHER EDUCATIONAL PROGRAMS An important responsibility of higher education is the provision of educational programs for persons in a wide variety of fields who have some other career or personal interest which occupies the majority of their time. These are both degree and non-degree programs.

Part-time degree programs are carried on in a great number of professional areas as well as in the liberal arts, and these programs are on both graduate and undergraduate levels. Continuing education has become an accepted part of the American scene. As an increasing percentage of our rising population graduates from high school and college, more people have the background and desire for continuing education, and are stimulated to seek it by the continuing growth of knowledge in their fields.

A substantial number of persons are studying in business and scientific fields under industry sponsorship at universities. At the University of Pittsburgh last year, 1700 of the part-time students received financial aid from their 35 employing firms.⁵

In addition, increasing numbers of persons attending colleges and universities are taking non-credit courses. These range from community-type courses, such as art or child development, which might suit the needs of a housewife, to advanced courses in management for business executives; they

⁵ School of General Studies, University of Pittsburgh, unpublished data.

range from an hour a week to ten or more weeks of full-time intensive training. The college or university degree has ceased to be the terminus of education. More than one-fourth of the persons now registered in higher education courses are adults not seeking degrees.⁶

Many corporations are sending middle and top management personnel to executive training programs at universities all over the country. Last year several thousand executives were enrolled in courses dealing with the policy level; if the courses dealing with technical aspects were included, the number would easily be doubled.⁷ Participants in such programs, though they are in residence, using university physical plant, and receiving instruction from faculty members, are not included in enrollment figures.

Although community services cannot be translated into enrollment figures, notice should be taken of faculty members' participation in

⁶ Educational Policies Commission, Higher Education in a Decade of Decision, National Education Association of the United States & the American Association of School Administrators, Washington, D. C., 1957, p. 4.

⁷ Executive training programs have had a rapid growth. The first was held in Milan, Italy in 1934. In the United States, Harvard held the first such program in 1942 at the request of the Navy Department to train naval personnel in administration; in 1946 the program was converted to one for civilians. In 1949 the second executive training program in the United States was begun at the University of Pittsburgh; since then, they have been added to the offerings of universities all over the country.

educational forums, at meetings, on radio and TV, in professional associations and community groups. Significant use is also made of faculty and plant for short courses and refresher courses in a number of professional fields such as nursing and accounting and for seminars and workshops for teachers and others.

Economic research institutes of colleges and universities assist corporations and labor organizations, and public administration and municipal research bureaus render substantial services to state and local governments. Nationality groups and other cultural organizations can achieve a cohesiveness and strength through use of universities' libraries and meeting rooms and through the leadership which may be provided by university personnel. Not only are all these varying groups served by the colleges and universities, but the community as a whole benefits from the social and intellectual activities.

ASTED
ALENTS

Pennsylvania is not providing adequate opportunities for higher education to its sons and daughters of college age. Pennsylvania ranks 27 among the states in the percentage of its college-age population actually enrolled in an institution of higher learning with only 28.7 per cent enrolled. The only states in the northeastern heavily populated part of the country which rank below Pennsylvania in this regard are the states of New Jersey and Maine.⁸ Further, Pennsylvania has historically lagged in the ratio of college enrollments to college-age population as shown in Exhibit 4.

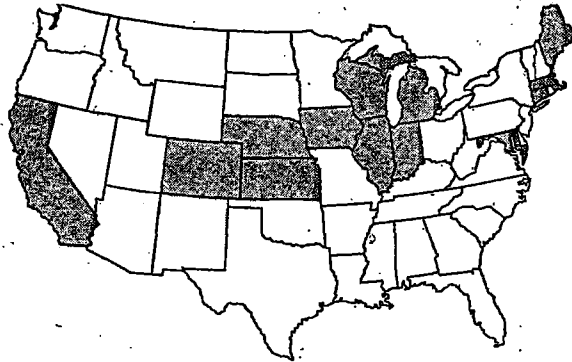
⁸ Calculated from data in Thompson, op. cit.

EXHIBIT 4

COMPARISON OF PENNSYLVANIA WITH OTHER STATES
IN PER CENT OF COLLEGE-AGE POPULATION, 18-21 YEARS OLD,
ENROLLED IN INSTITUTIONS OF HIGHER EDUCATION,
1910, 1930, and 1955

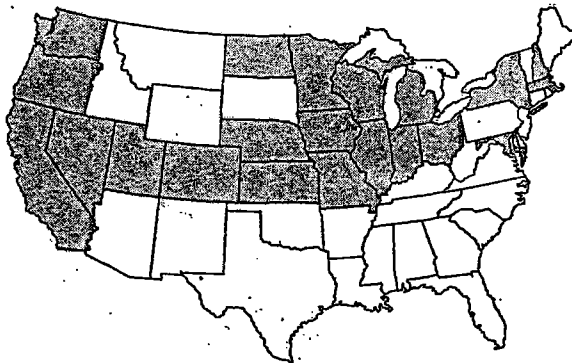
1910

PENNSYLVANIA'S PER CENT EXCEEDED BY 14 STATES



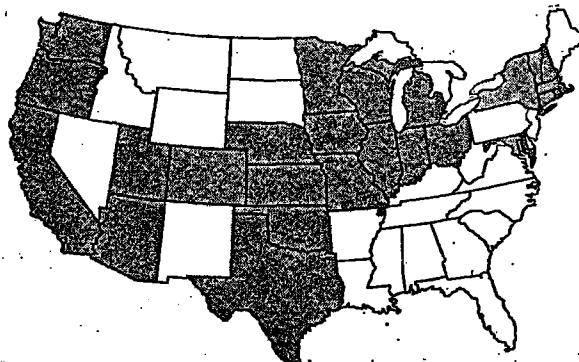
1930

PENNSYLVANIA'S PER CENT EXCEEDED BY 22 STATES



1955

PENNSYLVANIA'S PER CENT EXCEEDED BY 26 STATES



■ Ratio of college enrollment to population is greater than in Pennsylvania
□ Enrollment to population ratio is equal to or less than in Pennsylvania

Sources:

1910 and 1930 population and enrollment statistics from Higher Education in the Forty-Eight States; 1955 statistics from Thompson, op. cit.

The loss of potentially educated men and women to our society is a matter of grave concern. This loss is particularly serious for the business community which depends on highly-trained personnel. A survey of the post-high school plans of graduating Pennsylvania high school seniors⁹ brings out a problem of even greater significance. Many students who are mentally qualified for college and professional education are not motivated for training beyond the high school. The survey shows that out of the 51,400 seniors, about half of all graduates, who have a reasonable chance of success in college, 21,670 or 42 per cent do not even express a desire to attend a college or university. Another eighty-four hundred, or more than 16 per cent, are not planning to attend because of their lack of financial resources. Dael Wolfle estimates on a national basis that only 53 per cent of even the top one-fifth of graduating seniors enter college.¹⁰

This loss of potential, particularly in view of the international position of our nation, is to be regarded as a problem of gravest import. There is, then, an evident and urgent need to attract to colleges and universities the most qualified students not now motivated to attend and to make higher education financially feasible for all able high school students. An increased acceptance of the importance of higher education by American families must be achieved. Efforts by industry, foundations, and govern-

⁹ Pennsylvania High School Seniors, 1958, Their Mental Ability, Their Aspirations, Their Plans, preliminary statement prepared for the Advisory Panel on Study of Problems of Advanced Training by staff of the Joint State Government Commission, Harrisburg, September, 1958.

¹⁰ Wolfle, op. cit., p. 150.

ments to enable more of our capable high school graduates to attain higher education must be substantially increased.

ENROLLMENT
PROJECTION

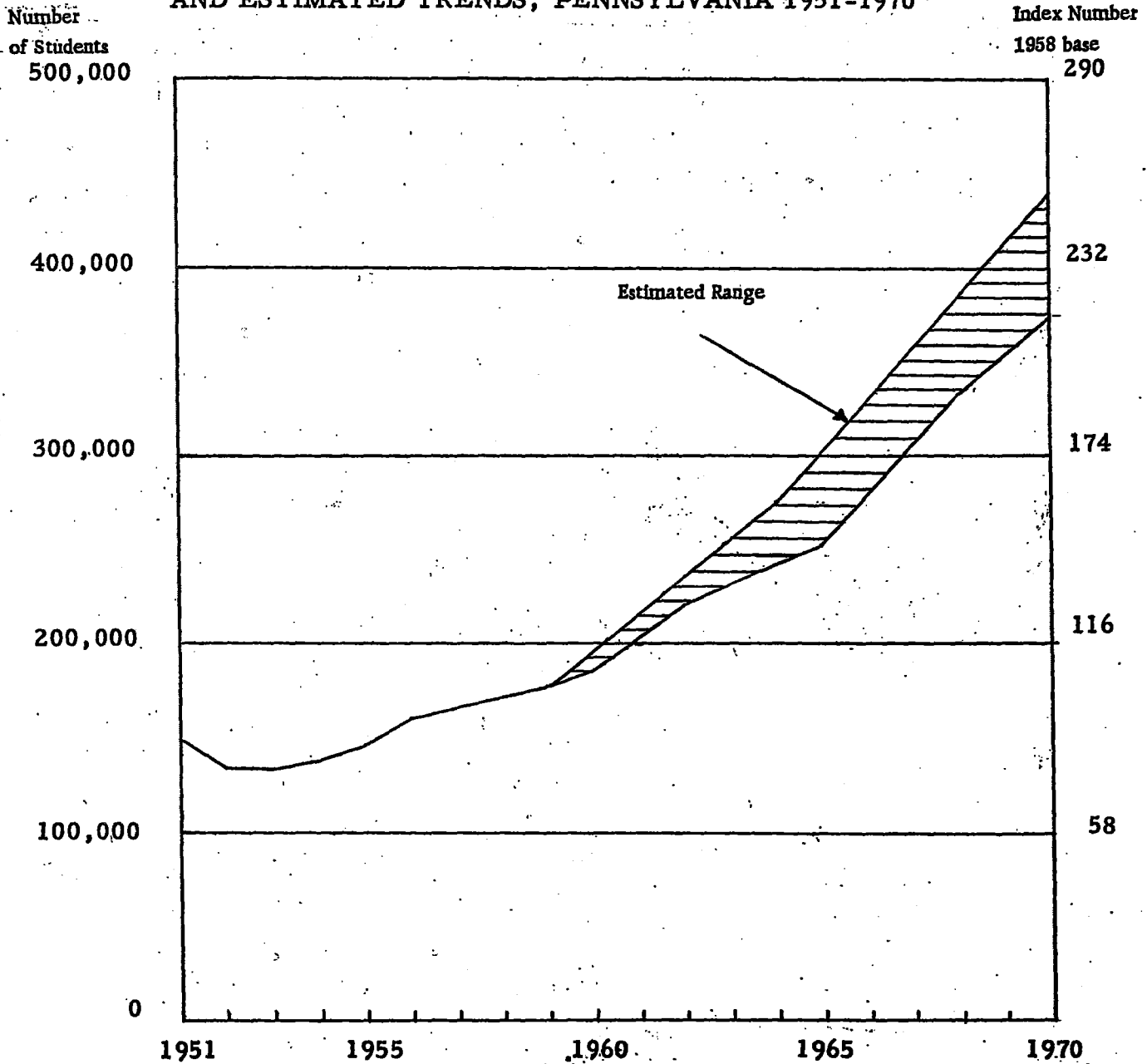
Exhibit 5 charts the Advisory Panel's estimates of enrollment to 1970. We have considered the growth in college-age population, in numbers graduating from high school, in numbers going on to college, in numbers engaged in graduate study, and in part-time and other educational programs. Because of these considerations, we regard it as inevitable that the minimum enrollment increase by 1970 over 1958 will be 114 per cent.¹¹

The Panel has noted the large numbers of able young people who are deprived of higher education through lack of motivation or financial support. This is a tragic loss in terms of personal fulfillment, of growth of our industry and economy, and of continuance of our Nation as a world power. It is imperative that educational opportunities and aid

¹¹ Three estimates of projected college and university enrollment for Pennsylvania were carefully studied by the Advisory Panel. The study by the Department of Public Instruction, The Enrollment Picture for the Decade Ahead, prepared under the supervision of Dr. Carl B. Morneweck, we found to be excellent. The population projections are based on widely accepted methods and the estimate of enrollment trends is based on actual experience in recent years. We have, therefore, accepted his prediction as our minimum. The projections by the Governor's Commission in Higher Education in the Commonwealth, Harrisburg, 1957, and by Dr. R. B. Thompson in The Problem of Rising College Enrollments support the Morneweck estimates both for full-time and total enrollments; however, the Governor's Commission study limited itself to full-time enrollments and the Thompson study, in our judgment, underestimated the size of the college-age group and assumed a rate of enrollment increase of one-half per cent per year whereas the actual rate over the last eight years was 1.1 per cent. The 1970 predictions range from 270,000 by Thompson, to 369,000 by Morneweck (which the Panel accepts as a minimum), to the Advisory Panel actual estimates of 443,000. Table 4 and 5 in Appendix C show total and full-time enrollment projections of these studies.

EXHIBIT 5

TOTAL ENROLLMENTS IN INSTITUTIONS OF HIGHER EDUCATION
AND ESTIMATED TRENDS, PENNSYLVANIA 1951-1970



Source: Morneweck, op. cit. (This projection to 1968 was extended to 1970 by the Advisory Panel.) Advisory Panel estimates represent a 20 per cent increase over Morneweck's estimates by 1970 attributable primarily to the anticipated effects of efforts to increase the proportion of able high school graduates attending college.

See Appendix C, Table 4, for supporting data.

and support be provided for more of these students. In this report we assume that there will be only moderate success in our efforts to attract more of the qualified students for higher education. Although the potential is much larger, we have assumed that 20 per cent more students will be attending college in 1970 as a result of programs designed to change social concepts in Pennsylvania regarding the importance of a college education than would be going without such programs of student aid and encouragement. Our estimate of 1970 enrollment in Pennsylvania colleges and universities is then 443,000, an increase over 1958 of 158 per cent.

**FULL-TIME-
EQUIVALENT**

ENROLLMENT The Advisory Panel enrollment projection includes both full-time and part-time students. Part-time students' use of college and university resources is only a fraction of that by full-time students and should receive less weight in estimates of the future need of resources. Therefore, for the purposes of projections to be made in subsequent chapters, both maximum and minimum enrollments have been converted to full-time-equivalent students. The conversion was calculated as follows:

Part-time students, historically, have accounted for 30 per cent of total enrollments. Using the Panel projections, 30 per cent of the total enrollment has been converted on the basis that 3.5 part-time students are equal to 1 full-time student.

On this basis, the 1958 enrollment of 172,000 has been converted to 140,000 full-time-equivalent students; for 1964 the minimum estimate has been converted to 202,000 and the maximum to 241,000; for 1970 the minimum has been converted to 292,000 and the maximum to 350,000 full-time-equivalent students. Assumptions in regard to income and expenditures in the following chapters are based on these projections of full-time-equivalent student enrollments. Exhibit 6 charts the minimum and maximum full-time-equivalent student enrollment.

CONCLUSION

The Advisory Panel's study supports an estimated increase in total enrollment in Pennsylvania colleges and universities by 1970 of 114 per cent as a result of the growth of our college-age population and because of the increasing percentage who will attend. This estimate is accepted, however, only as a minimum. We postulate that the introduction of effective measures to enable a greater proportion of able high school graduates to benefit from higher education will raise the estimated total future enrollment by at least 20 per cent over the minimum estimate by 1970. This will be an increase of 158 per cent over 1958. This estimate of 443,000 total enrollment by 1970 has been converted to 350,000 full-time-equivalent students.

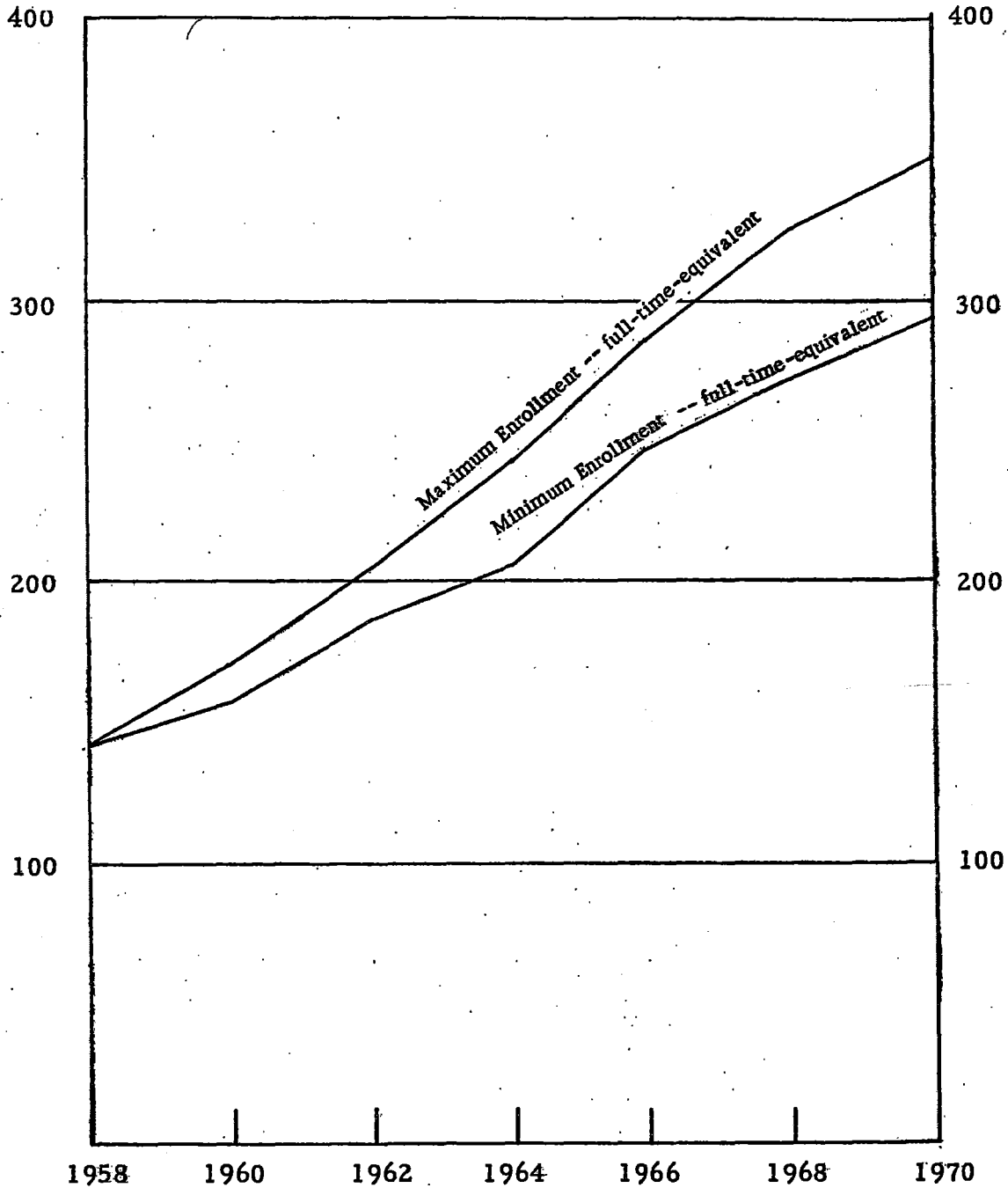
The population of the country is growing, but the crucial point is that the population of college age will have jumped by 45 per cent in one bound. More significant, the rate has remained high and presumably will continue to do so. This is, then, not a temporary problem which can

EXHIBIT 6

ADVISORY PANEL ESTIMATED MAXIMUM AND MINIMUM ENROLLMENTS
IN INSTITUTIONS OF HIGHER EDUCATION CONVERTED TO
FULL-TIME-EQUIVALENT STUDENTS AS DISTINGUISHED
FROM TOTAL STUDENTS,
PENNSYLVANIA 1958-1970

Thousands
of full-time-
equivalents

Thousands
of full-time-
equivalents



be solved by hit-or-miss measures. A vastly enlarged college population is a basic fact to be faced. As we have pointed out, not only are numbers normally attending college increasing, but also it is our conviction that further increases are necessary to avoid a tragic loss of our younger peoples' abilities to the nation.

Increasingly, the development of the nation and the growth of our economy and our family attitudes are calling for greater numbers of more highly educated persons. Continued growth demands expansion of higher education; the nation must throw its strength behind its vital resource, the institution of higher learning. As much as these statements are compelling for America's well-being, they are many more times compelling in view of the international climate and our competition with international communism.

CHAPTER III

The Increasing Costs of Higher Education

Immediate and practical action must be taken by the Commonwealth of Pennsylvania to marshal its resources for higher education. Already Pennsylvania lags far behind in number of teachers. Its physical plant has less capacity to expand than that of any other state in the nation. Its expenditures per capita for education are low compared to those of other states. As the Panel will subsequently establish, the Commonwealth of Pennsylvania addresses itself to the crisis of expanding enrollment at a period in time when it is least prepared. Moreover, Pennsylvania is the heart of a region which will experience more than 25 per cent of the total impact of the national growth in enrollments.¹ The paramount task becomes, then, to establish Pennsylvania institutions of higher education in a position of leadership during this rapid expansion.

College and university budgets must provide for faculty, library, administration, and physical plant. In this chapter the Panel examines the present status of these costs in some detail and projects them by major category. Costs projected in this chapter are based on current operating techniques and on the assumption that educational practices in Pennsylvania will continue without substantial changes in objectives, methods, and sources of support.

¹ S.U.A., Inc. Space Programming and Physical Plant Investment In American Colleges and Universities, 1957-1970. Appendix Table 12 p. 37-40.

ASSUMPTIONS

The Advisory Panel assumed that enrollment will not be curtailed as a measure to relieve pressure on institutions of higher education.

The general price level, cost of living, and other economic factors are assumed to be constant since recognition of these factors would tend to diffuse the problems presented herein. The Panel urges, however, that the estimates be subject to constant revision as costs fluctuate as a result of inflationary factors.

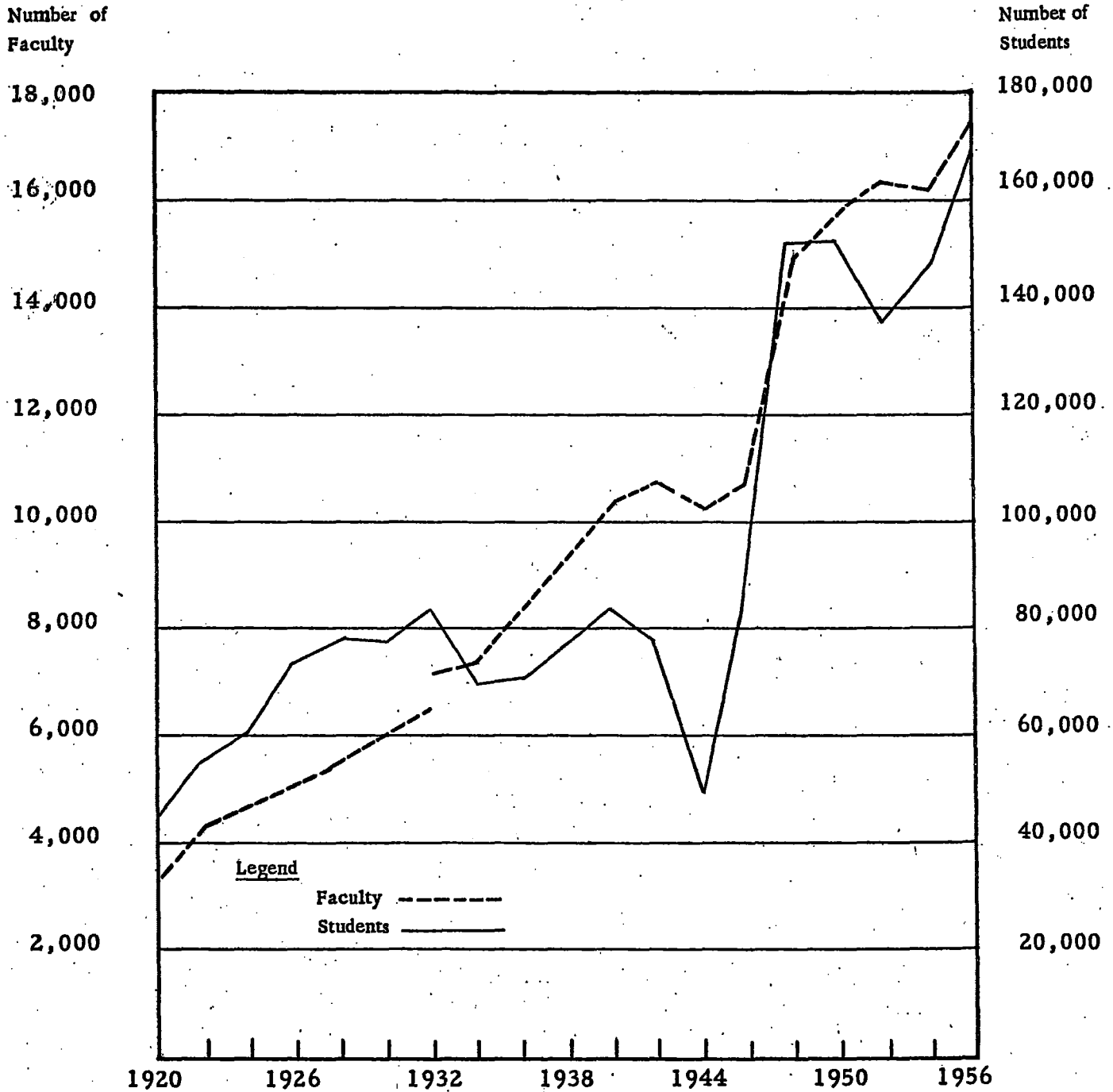
Finally, the Advisory Panel has assumed that the Commonwealth of Pennsylvania will consider only the expansion of existing institutions or facilities in existing school systems to meet the enrollment crisis. The projections presented in this chapter have considered only the net addition to existing facilities. A much larger total capital cost would result if complete new plants were constructed since basic service areas would have to be built. These are costly facilities and would add many millions of dollars to the cost projection.

FACULTY

Colleges and universities throughout the Commonwealth employ 17,500 faculty members. Historically, the number of faculty has been directly related to the number of students enrolled. Increases in faculty, though subject to some fluctuations, have been directly proportional to increases in enrollment, as can be seen from examination of Exhibit 7. The number of faculty employed in Pennsylvania now is below the

EXHIBIT 7

RELATIONSHIP BETWEEN STUDENT ENROLLMENTS AND FACULTY REQUIREMENTS IN INSTITUTIONS OF HIGHER EDUCATION, PENNSYLVANIA 1920-1956



Source: U. S. Office of Education, Biennial Survey of Education, Washington, D. C.

proportion needed to meet the current enrollment. This is further substantiated by the data shown in Exhibit 8 which indicate that Pennsylvania enrollments have been increased by 105 per cent since 1939-40 while national enrollments advanced 94.3 per cent. Yet, during the same period, Pennsylvania's teacher strength increased by 69.5 per cent whereas in the nation the faculty numbers went up 103.4 per cent. Already the problem of teacher supply in institutions of higher learning is evident throughout the nation. Nearly 40 per cent of present faculty are teaching on a part-time basis.²

Continuation of education under present practices and methods would require an increase of 20,400 faculty members in the Commonwealth by 1970. This would maintain current student-faculty ratios which for the last several years have averaged 12.4 to 1.³

Wolfle has pointed out in his America's Resources of Specialized Talent that "even if every person who receives a doctor's degree in the next few years is appointed to a college or university faculty, there will not be enough (teachers) to satisfy the anticipated requirements."⁴

² National Education Association, Teacher Supply and Demand in Colleges and Universities, 1955-56 and 1956-57, p. 36.

³ Computed from data published in Statistical Report of the Superintendent of Public Instruction, Commonwealth of Pennsylvania, Department of Public Instruction, Harrisburg, Pennsylvania.

⁴ Dael Wolfle, America's Resources of Specialized Talent, N. Y. Harper and Brothers, 1954, p. 126.

EXHIBIT 8

INDEX OF INCREASES IN FACULTY AND ENROLLMENT

UNITED STATES AND PENNSYLVANIA

1939-1955

	FACULTY		ENROLLMENT	
	United States	Pennsylvania	United States	Pennsylvania
1939-40	100.0	100.0	100.0	100.0
1947-48	152.2	143.5	175.1	182.9
1949-50	167.9	152.4	178.0	183.8
1951-52	166.4	158.1	154.0	164.5
1953-54	181.0	157.2	168.3	177.4
1955-56	203.4	169.5	194.3	205.0

Source: U. S. Office of Education, Biennial Survey of Education, Washington, D. C., except 1955-56 data which is unpublished and which was obtained from the U. S. Office of Education and converted to index numbers by the Panel.

Even more significant is the NEA report, that throughout the nation only 3500 out of 9000 doctoral graduates each year are attracted to college and university careers in teaching, administration, and research.⁵

Therefore, Pennsylvania must increase its faculty numbers to the maximum extent possible at a time when faculty supply is critically short. The potential supply estimated by the Panel indicates that even the most optimistic view would support a supply equal to only 50 per cent of total needs.⁶ Two positive actions must be undertaken if the Commonwealth is to realize the full potential of its present and future faculty:

1. Better utilization of faculty must be achieved.
2. Greater numbers of qualified individuals must be attracted to the teaching profession.

⁵ National Education Association, op. cit., p. 29

⁶ This NEA data indicates that the number of doctoral degree holders in the country attracted to colleges and universities will increase by 52,500 over the next twelve years. As the enrollment in higher education in Pennsylvania represents approximately 7 per cent of the national total, a proportionate share of the doctoral degree holders would yield 3675 for the Commonwealth. The NEA data reveals 40 per cent of full-time faculty members are doctoral degree holders. This relationship has been extended by the Panel to the part-time faculty. Applying this percentage to the total additional faculty requirements for Pennsylvania of 20,400, a need for 8160 doctoral degree holders can be established. Practically, then, only 3675 doctoral degree holders can be attracted for 8160 positions. The Panel has therefore concluded that only 50 per cent or 4080 of the positions requiring the doctorate can be filled.

These two objectives should be adopted by every institution of higher learning in the Commonwealth, and mutual cooperation in the development of aggressive programs to advance these objectives should be initiated now

The fact that enrollments are increasing at a more rapid rate than faculty supply will call for the development of more techniques whereby the faculty can teach more students than in the past. Suggested developments in utilization of classroom hours, in student self-education, in curriculum, and in administration are discussed in Chapter V.

For purposes of its study, the Panel has projected faculty available at 50 per cent of the needs. Increase in the number of students per faculty member from the present ratio of 12.4 to 1 will be the result. However, our projections indicate that the ratio will not exceed 21 to 1 at the maximum enrollment. This is not to suggest a standard; however, the California Restudy does mention a 20 to 1 student-faculty ratio as not undesirable. The practical considerations in this problem are the most pressing and may force some lowering of quality standards. It is the hope of the Panel that more effective management will make this statistic less significant in measuring quality.

The problem of increasing numbers of faculty available in the Commonwealth of Pennsylvania is more difficult than that of increasing productivity. Even before other solutions can be made effective, substantial increases in salary must be offered to faculty members.

7 Detailed studies of Pennsylvania higher education which are necessary for making precise judgments are not available. In the absence of such studies we have had to rely on those made in other states. The Panel found the study made in California, A Restudy of the Needs of California in Higher Education, 1955, the most useful and refers to it frequently in this chapter.

The President's Committee on Education Beyond the High School which suggested 80 per cent increases has stated that faculty members are subsidizing the education of every student in college by accepting inadequate salaries.⁸ Salary comparisons by fields indicate that as a group teachers are suffering one of the severest financial squeezes in the nation.

The New York Times reported real income for faculty increased 12 per cent above 1940 due largely to Ford Foundation grants. But by comparison, lawyers gained 29 per cent; industrial workers, 64 per cent; and physicians, 96 per cent.⁹

To establish a salary level which is competitive with those of industrial, governmental, and other enterprises attracting potential college faculty persons, the average salary of faculty members throughout the nation must increase from the present \$6,000 per year to \$9,900 over the next five years.¹⁰ This is an increase of 65 per cent applied equally to all ranks of faculty members. Such an advance would create a minimum entry salary of approximately \$6,000 per year. The starting salary would still be well below the average starting salary of \$7,740 offered to doctoral degree holders in 1957 by private industry and governmental agencies.¹¹

Concurrently, personnel benefits must be expanded to include all normal benefits offered by other employers, government or private. The benefits programs vary substantially from institution to institution.

⁸ President's Committee on Education Beyond the High School, Second Report to the President, Washington, D. C., July, 1957, p. 6.

⁹ New York Times, "College Teachers Pay", April 28, 1957.

¹⁰ Recommendation of the President's Committee on Education Beyond the High School for an 80 per cent increase adjusted to reflect gains realized to date, op. cit., p. 6.

¹¹ Journal of College Placement, October, 1957, p. 52.

Many benefits which are considered quite normal in our society today are still not offered to the faculty of many institutions throughout the country.¹²

Within the fields of science and engineering, government, industry, and educational institutions compete for professional personnel. For this reason, raising faculty salaries will be only temporarily effective as the new levels set will soon be met by industry and government.

This brings our attention, then, to another kind of benefit which educational institutions offer, the academic atmosphere which includes time for research and the satisfaction, and sometimes stimulation, from outstanding graduate students. This benefit cannot be duplicated by industry though the attempt to do so may be made. On the other hand, industry can often offer research-minded scientists and engineers the use of equipment and laboratories more complex and extensive than those of colleges and universities and equal amounts of free time for independent self-designed research.

LIBRARY

Another basic facility of colleges and universities is the library. Standards advocated in the California Restudy of higher education establish the number of volumes for basic library collections. This study

¹² Appendix C, Tables 6 and 7 give data outlining benefit programs at 1,152 institutions.

suggests several standards for projecting the size of library collections. The Advisory Panel has used 30 volumes per student as a representative figure for use in calculating library annual acquisition requirements.¹³ In accepting this standard, the Panel has not considered standards for establishing new libraries which require acquisition of 75 to 100 volumes per student until a basic collection of 1,750,000 volumes has been completed. The student equivalent enrollment increments, both maximum and minimum, established in Chapter II have been applied to this standard rate. On these calculations, 6,300,000 new volumes will be required in Pennsylvania libraries by 1970 if maximum enrollment is achieved; 4,560,000 will be needed if only the minimum enrollment projection is achieved. Such expansions will require total investments of \$18.9 million and \$13.5 million, respectively.

The costs of additions to collections have been reflected in the library operating costs and are projected at annual rates of \$1.2 and \$0.9 million, respectively, each year.

Present college and university library collections in Pennsylvania aggregate some 7,959,000 volumes or 57 volumes per full-time-equivalent student. The maximum additions recommended under the California standard would bring the total collections to 14,000,000 or a collection

¹³ The California study, op. cit., presents a range of from 20 to 50 volumes per student as a standard for library collections after acquisition of the basic collection depending on the kind of institution. The Panel has selected 30 volumes per student as a conservative average.

of approximately 40 volumes per student equivalent; the total collections would be increased by 75 per cent though number of volumes per student would be decreased.

Improvement of methods within the library will be possible as more effective techniques are developed for cataloging library volumes. Many worthy recommendations have been advanced for improvement of library utilization. Space planning and use of electrical and electronic equipment for cataloging will improve utilization of resources. A minimum reduction of 20 per cent per student in costs of operation can reasonably be expected by 1970.

The challenge of Soviet education has been stated above. In providing university libraries, the Soviet Union has far surpassed our efforts. For example, the library of the University of Leningrad contains a million more volumes than the libraries of Pennsylvania's four largest universities combined. The number of volumes per student at Leningrad is 425 as compared with 57 volumes per student in Pennsylvania institutions of higher education (both these figures are based on full-time-equivalent students). Nor is this an isolated example; in university after university in the Soviet Union the libraries far exceed in size those in this country.

ADMINISTRATION Two aspects of administrative needs have been investigated by the Advisory Panel. These are the general administrative requirements at the top management level and in the supporting services, particularly

in the fund raising, student, and business fields. The second category of administration examined by the Advisory Panel includes those administrative functions of the academic departments of the university or college. Changing needs of the institutions will encourage a new approach to administration in educational institutions, particularly in the larger institutions where problems are complex and require specialized administrative talent.

Professional staff people are employed in the ratio of approximately one for every eight faculty members. Traditionally, the number of administrative personnel has increased in direct proportion to enrollments. This trend is expected to change over the next fifteen years. The more dynamic nature of educational institutions will require staffing for functions which exist only in rudimentary form within education today. To cite a few examples, it will be necessary to establish specific offices to deal with problems of space utilization, methods and procedures, organizational alignments, planning, educational research, and many other specialized fields which today receive only cursory examination by regular staff members or committees of faculty. Faculty committees which perform administrative work may disappear in attempts to relieve the overburdened teacher. Each of these requirements will force growth in administrative personnel.

The cumulative impact of teacher shortages, enrollment increases,

facilities limitations, and financial limitations will compel college and university officials to search for more economical solutions to operating problems. Competent administration will be indispensable and new and highly specialized personnel will be necessary at all institutions of any size. Universities to date, have failed to train personnel for administrative positions and such training will become more urgently needed.

Increases in proportion to projected enrollments would suggest that in 1970 some 3,000 or 3,600 professional staff people would be employed by Pennsylvania institutions of higher learning. The Advisory Panel suggests that this number will increase by at least an additional 25 per cent during the next 15 years.

It is in the area of departmental administration that the greatest expansion of personnel is predicted. Since faculty personnel available for employment will be only one-half the number needed, many non-teaching tasks of the faculty must be shifted to other personnel. These tasks must be those which are incidental to the academic work and which do not require professional training to perform.

Mere assignment of additional personnel to faculty will not accomplish the objective of reducing the expenditure of faculty time on non-academic tasks. The organization and staffing of an educational institution presents a unique problem in administration. Since individuals employed in the academic field determine what they shall teach and how

they shall teach, they establish the standards of performance within the classroom. Naturally department heads may exert influence, but the ultimate decision is the instructor's. The task of administration is one of fostering improvement in the classroom through creating environments which make faculty members more productive. Fostering faculty efficiency must become a function of the total institution through the cooperative effort of the faculty and administrative personnel.

OPERATING COSTS

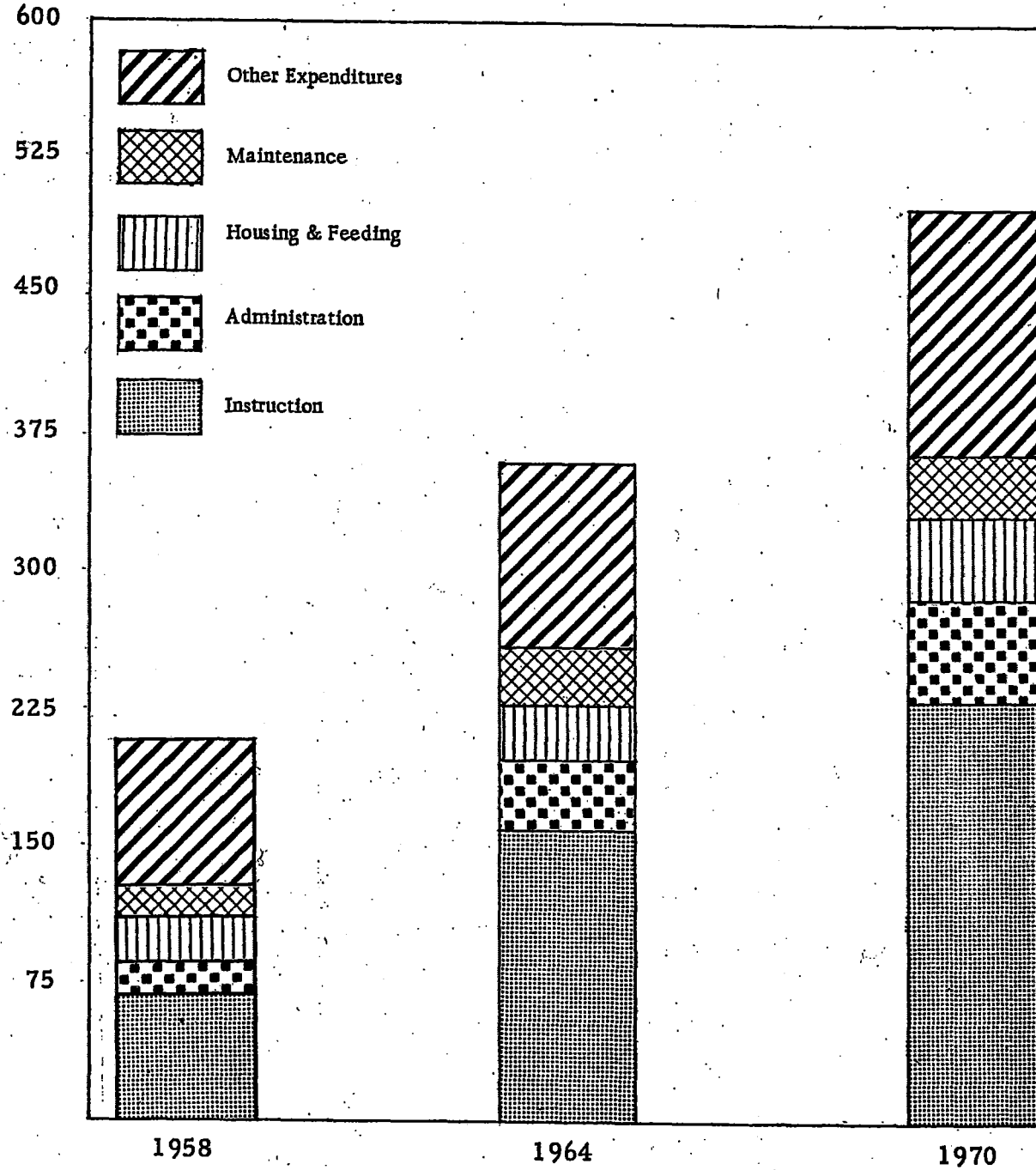
The operating expenditures have been projected to 1970 in Exhibits 9 and 10 on the basis of minimum and maximum enrollment predictions. It must be reiterated that these estimated costs of operation are not adjusted for changes in economic conditions. As noted in the discussion of faculty salaries, the 65 per cent increase merely re-establishes salaries at a level comparable to other professional fields. Housing and feeding costs have been projected in direct proportion to student increases in enrollment. Plant maintenance costs have been increased directly in proportion to the capital plant requirement set forth in the next section. Cost of maintenance has been estimated at \$1.00 per square foot, which amount should be adequate to cover maintenance of additional campus areas.¹⁴ General administrative costs have been projected at a rate which is 25 per cent in excess of the increases in enrollment. Scholarship expense has been estimated to remain at the same dollar figure in order to present the

¹⁴ Division of Physical Plant, University of Pittsburgh

EXHIBIT 9

ESTIMATED OPERATING EXPENDITURES UNDER
 CONDITIONS OF MINIMUM ENROLLMENTS
 IN INSTITUTIONS OF HIGHER EDUCATION,
 PENNSYLVANIA 1958, 1964, 1970

Millions
 of Dollars

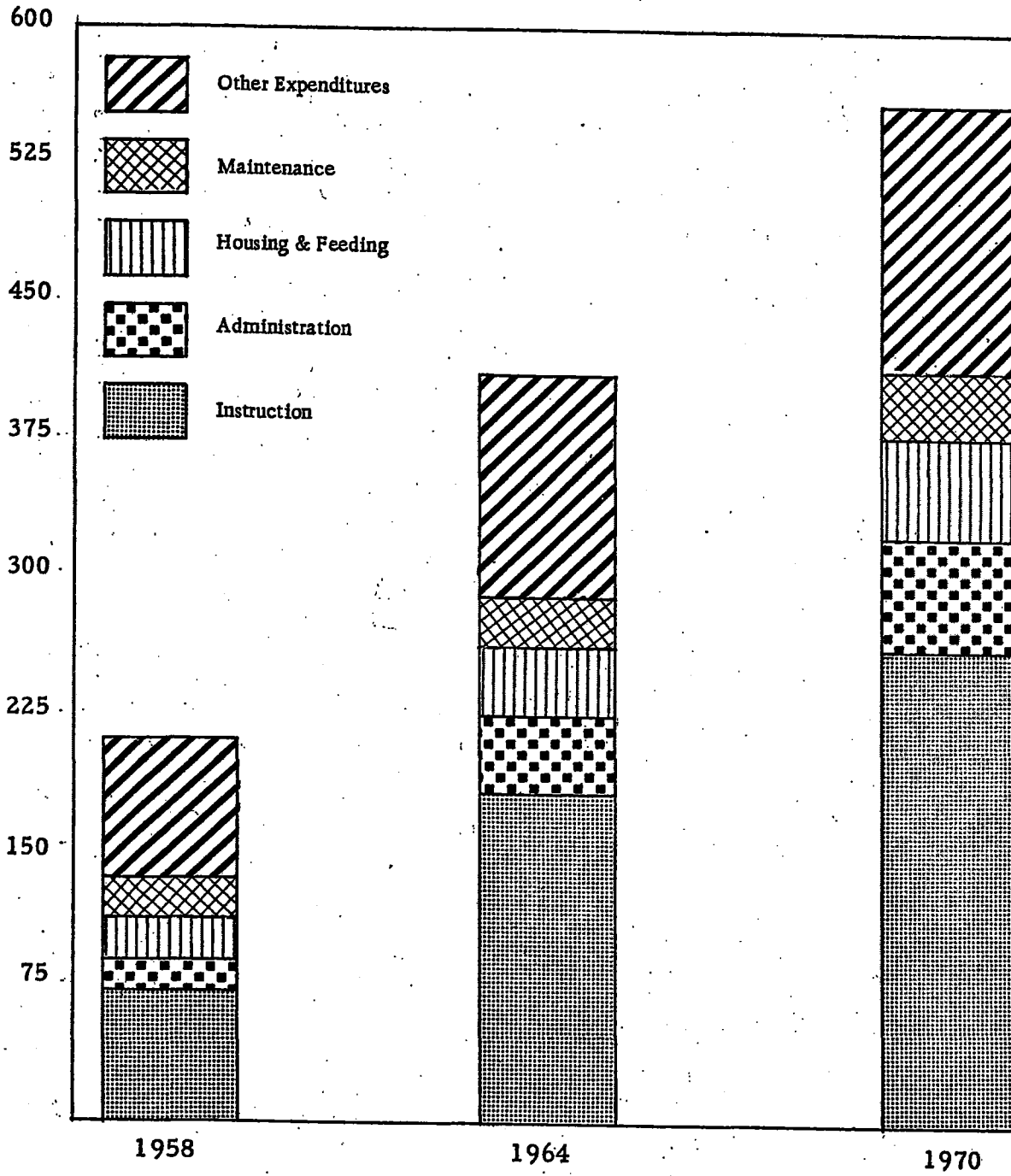


See Appendix C, Table 8, for supporting data.

EXHIBIT 10

ESTIMATED OPERATING EXPENDITURES UNDER
 CONDITIONS OF MAXIMUM ENROLLMENTS
 IN INSTITUTIONS OF HIGHER EDUCATION
 PENNSYLVANIA 1958, 1964, 1970

Millions
 of Dollars



See Appendix C, Table 9, for supporting data.

most conservative figure even though it may be assumed that colleges and universities will spend more money on scholarships in the years ahead. All other costs have been grouped together. This category is composed primarily of expenditures which are directly supported by income and therefore are not significant in the estimates of needs.

COSTS OF GRADUATE EDUCATION

The complex problem of determining the cost of education for a student in various academic programs has been investigated by the Panel. Unfortunately, more definitive quantitative data are needed for conclusive estimates. Various studies of this aspect of costs indicate that the cost of education per student varies significantly with the level of education. A study by a Pennsylvania university of costs of graduate and undergraduate education indicates that the cost per student to the institution, exclusive of housing and feeding costs, in undergraduate liberal arts is \$995, in graduate humanities is \$3728, and in medicine is \$6056.¹⁵ Costs in the final year of graduate work can multiply up to ten times the cost of the first undergraduate year. As graduate enrollment increases, this becomes a significant cost factor and may propel costs upward even more rapidly than the Panel has suggested.

PHYSICAL PLANT

The Space Utilization Association of New York City has conducted a nation-wide survey of physical facilities requirements for all college and university facilities except dormitories. This study reports that

¹⁵ Organization and Methods Division, University of Pittsburgh, unpublished data.

Pennsylvania will require \$435 million by 1970 for new plant, if the Commonwealth's needs are to be met. These needs are estimated at 14,400,000 additional square feet of plant space to provide additional facilities at existing educational institutions. Such an increase, therefore, dictates that the capital plant in Pennsylvania must be nearly doubled to accommodate the students expected by 1970.¹⁶

The physical plant capacity of institutions of higher learning in Pennsylvania was reported in the spring of 1956 to have less than 8 per cent additional capacity.¹⁷ Of all the states reporting to U. S. Office of Education, Pennsylvania reported the lowest capacity for expansion.

To establish the requirement for Pennsylvania physical facilities expansion, the Advisory Panel based its projections on the California Restudy. Total square footage and capital requirements by category are set forth in Exhibit 11. These calculations do not include estimates of the cost of renovating existing facilities. These requirements are valid only for the present academic calendar; Chapter V shows the improved utilization possible under the trimester calendar.

Using an average cost of \$30 per square foot, the calculations based on the maximum enrollment potential project a cost of \$555 million for physical plant by 1970, some \$120 million more than The Space Utilization Association study estimated. This amount is further increased

¹⁶ S.U.A., Inc., op. cit. p. 37.

¹⁷ Computed from unpublished data, U. S. Office of Education

EXHIBIT 11

ADDITIONAL SQUARE FEET OF PLANT
AND ADDITIONAL PLANT INVESTMENT NEEDED IN INSTITUTIONS
OF HIGHER EDUCATION, PENNSYLVANIA BY 1970

	<u>Maximum Enrollment Prediction</u>	<u>Minimum Enrollment Prediction</u>
Classrooms	1,890,000 sq. ft.	1,368,000 sq. ft.
Laboratories	3,675,000 sq. ft.	2,710,000 sq. ft.
Research	1,008,000 sq. ft.	806,000 sq. ft.
Departmental offices	2,940,000 sq. ft.	2,128,000 sq. ft.
Auditoriums	420,000 sq. ft.	304,000 sq. ft.
Administration	630,000 sq. ft.	456,000 sq. ft.
Library	2,430,000 sq. ft.	1,596,000 sq. ft.
Food Service & Student Center	1,440,000 sq. ft.	912,000 sq. ft.
Health Services	<u>360,000 sq. ft.</u>	<u>228,000 sq. ft.</u>
Total Net Square Feet	14,793,000 sq. ft.	10,508,000 sq. ft.
Add: 25% for care and service	<u>3,698,250 sq. ft.</u>	<u>2,627,000 sq. ft.</u>
Gross square feet	18,491,250 sq. ft.	13,135,000 sq. ft.
Total Cost @ \$30 per square foot	\$554,737,500	\$394,050,000
Add: Dormitory Costs	<u>399,000,000</u>	<u>311,300,000</u>
Gross Investment Needed	\$953,737,500	\$705,350,000
Less: Application of portion of dormitory income	<u>190,747,500</u>	<u>141,070,000</u>
Net Financing Needed	<u>\$762,990,000</u>	<u>\$564,280,000</u>

when the requirements for dormitories, \$399 million, are added. A total of \$953 million or nearly a billion dollar additional investment in higher education will be required for physical plant assuming the maximum potential enrollment. This figure and the corresponding figure for the minimum enrollment projection of the panel establish the range of capital investment required for higher education plant facilities. Approximately 20 per cent of this amount can be financed from revenues of dormitories. Experience of other institutions in the field of dormitory financing indicates that from one third to one-half of the capital cost of dormitory facilities is self-liquidating.¹⁸ Therefore, the Panel has projected a capital cost of from \$564.3 million to \$763.0 million.

The \$30 per square foot cost of construction figure is recommended in the study of the Space Utilization Association. It is allocated as follows: \$20 for actual construction; \$6 for land and site development; and \$4 for equipment. These cost categories include surveys, preparation of site, construction, and all interior finishing -- chairs, cabinets, desks, light fixtures, etc. The estimate of \$6 for land and site development is a fair figure for rural areas and for liberal arts colleges but for urban institutions and for universities the figure is low because of higher land and construction costs. Actually these figures are lower than some of our current costs. In this calculation, the amount of space included for research is predicated

¹⁸ A Restudy of the Needs of California in Higher Education, 1955,
p. 337

upon the increasing trend of graduate education within the country.

As the number of persons entering graduate school accelerates, the requirements for research facilities will become more urgent. These are the most costly facilities within any educational institution.

The Panel has projected a need of from \$564.3 million to \$763.0 million to meet the increasing enrollments of the next twelve years. To meet the needs of the same group of students for elementary and secondary education, Pennsylvania state and local governments have obligated \$1,275 million from 1950 through 1958 for public school buildings. Perhaps another \$400 million was spent for private school construction. To be sure, some of the need for school construction was brought about by migration to suburbs since World War II. In California a five year plan for construction for the University of California alone has been priced at more than \$542 million. The governor's budget office recently requested estimates for capital plant construction from all state-aided or state-supported institutions of higher education in Pennsylvania. For these institutions alone and only for the next six years the requests exceeded \$322 million.

The Advisory Panel has not explored in detail the possibility of acquiring space by renovation of existing facilities. Some space can be gained by renovation; however, the Panel has found little evidence to support a substantial and economical improvement in space problems from this method.

CONCLUSION

Costs projected in this chapter are based on current operating techniques and on the assumption that educational practices, except where faculty shortages force other methods in Pennsylvania will continue without substantial changes in objectives, methods, and sources of support. Chapter V suggests methods by which these costs can be reduced.

Using enrollment projections outlined in Chapter II and the best available standards for college and university costs, the Advisory Panel projects an annual expenditure of from \$497 million to \$560 million per year in 1970. In addition, capital outlays for new physical plant to accommodate increased student enrollments will require an additional investment of from \$565 million to \$763 million for physical plant expansion.

CHAPTER IV

Financing the Increasing Costs of Higher Education

Chapter I of this report discusses the crisis in higher education facing the Commonwealth of Pennsylvania. Chapter II attempts to quantify the problems of increasing enrollments, and Chapter III discusses the costs for operations and for capital expansion in order to accommodate increased enrollments with little basic change in educational schedules or in the attitudes of parents, students, and alumni. This chapter discusses the amount of revenue which may be expected to meet the rising costs of higher education and estimates the magnitude of the deficit.

ASSUMPTIONS

It is assumed that the Commonwealth of Pennsylvania recognizes as a major responsibility its duty to provide opportunities for higher education for all of its younger citizens who are motivated and who possess qualifications for college training and to all its college graduates who have the ability and aptitude for continued education in graduate and professional schools. This responsibility must be met if the Commonwealth is to progress and retain its status as one of the leading states of the Union.

It is assumed that in financing the increasing cost of higher education the Commonwealth of Pennsylvania wishes to retain the advantages of the balance between public institutions and private institutions of higher learning. Implicit is the further assumption that the

state government has no inclination to control curriculum content, teaching methodology, or administration of the individual institution.

In the data which follow, as in the data which have been presented in previous chapters, no attempt has been made to assess the effects of further inflation in our economy. The Advisory Panel assumes that the effect of inflation will fall equally on all factors of costs and all factors of income. This obviously is not a valid assumption, since it is apparent that some items will lag substantially behind other items. However, it is not considered desirable in this study to attempt to assess such lags. It must be recognized that all data are subject to correction as economic conditions change.

THE GAP
BETWEEN
COSTS AND
INCOME

Exhibit 12 compares estimated income from all sources up to 1970 with the costs arrived at in the preceding chapter. This chart assumes that the increase in enrollment reflects only increases in college-age population. It gives little or no effect to an increased student aid program or to activities for widening motivation for a college education. These will be reflected in a later chart. The data in this chart give no weight to the possibility of a change in the attitudes of personal responsibility of those who contribute to the income of colleges and universities -- parents, students, alumni. The following are the assumptions made in this chart:

1. Our data show that on the average tuition and fees for students in colleges and universities of Pennsylvania cost the student \$500 per

year. Our predictions assume that with the continuation of existing attitudes and in the absence of student aid incentives, an increase in tuition will result in lowered enrollments from students whose economic position is marginal, and the purpose of extending opportunities to qualified young men and women will be defeated.

2. On the other hand, it is assumed that endowment and gift income will increase by at least 100 per cent between 1958 and 1970. Although some of this increase will come as a result of there being additional numbers of alumni to make contributions to their institutions, most of the increase is expected to come from other than direct alumni giving. The dependence of the business corporation upon the university is increasingly being realized. It is the college-trained individual who provides talent for the corporation. It is the research of our institutions of higher learning that improves industrial productivity. A major share of the market of the production of our industries can be attributable to leadership taken by the university-trained segment of our population.

That business enterprise is recognizing its role in higher education is apparent from the fact that between 1954-55 and 1956-57, corporation-giving to 910 colleges and universities throughout the nation increased from \$39.4 million to \$76.9 million, or 95 per cent.¹ Corporation

¹ Council for Financial Aid to Education, Inc., Voluntary Support of America's Colleges and Universities, 1956-1957, New York, April 1958, p. 6.

giving is also manifest in the record of the general welfare foundations (most of which have corporate support). Between 1954-55 and 1956-57, foundation giving increased from \$50.3 million to the same 910 institutions to \$319.1 million or 535 per cent.² The latter figure includes the effect of the large endowment grant from the Ford Foundation for teachers' salaries.

These amounts include funds for capital as well as operating purposes, so that these remarkable gains cannot be projected at the same rates in considering income for operations, but nevertheless it is believed that substantial gains in income will continue as a result of voluntary contributions of business enterprises.

3. A substantial increase in state aid will be necessary. However, so as not to distort the real difference between expenses and income from other than state sources, the amount of annual state aid shown on the chart is held to the current figure of \$40 million in 1964 and 1970.

4. Federal aid is shown as an increasing amount, nearly all of which has been offset by predicted increases in expenditures for sponsored research.

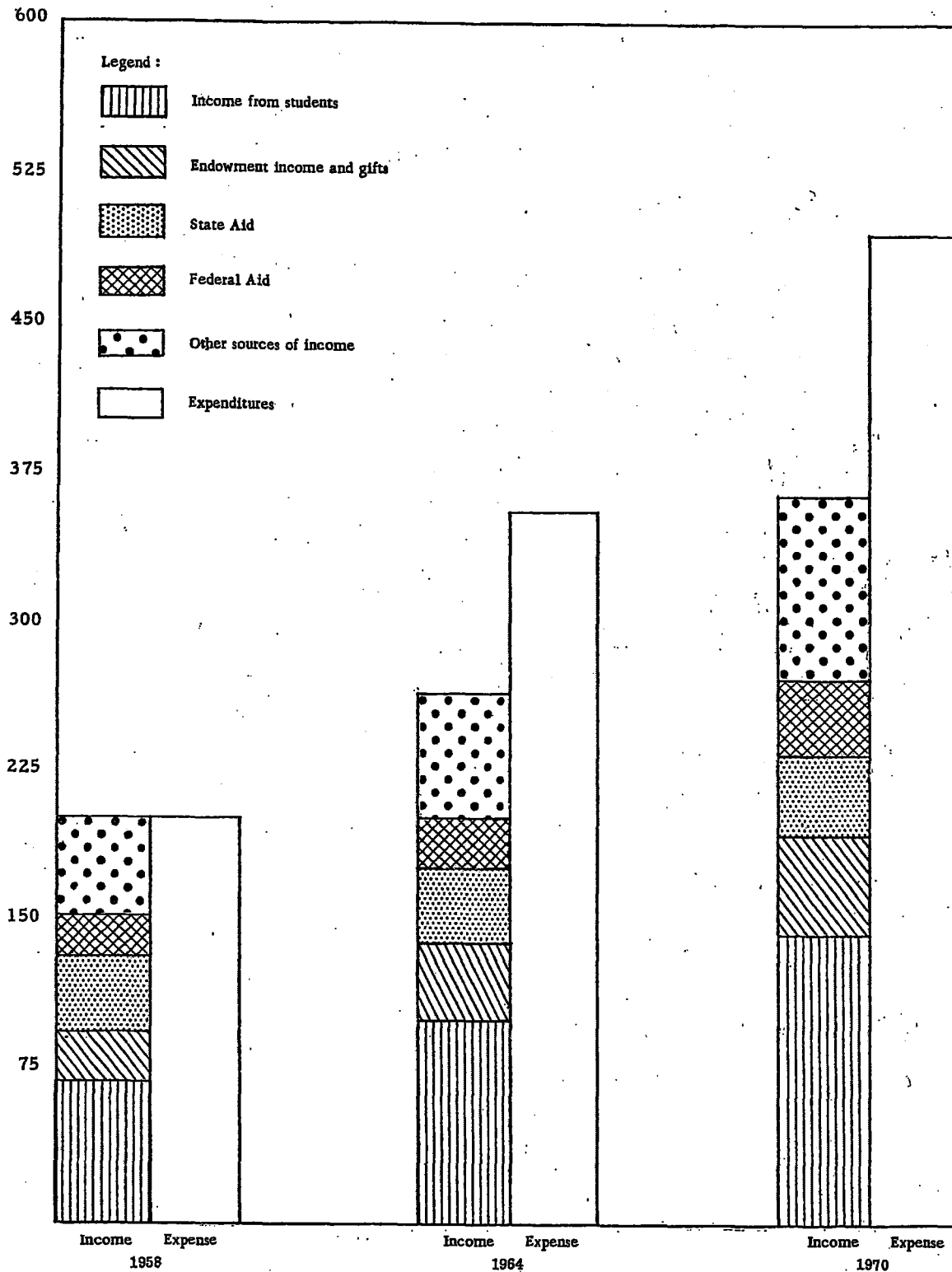
5. The increases predicted in "other sources of income" will come about as a result of increased enrollment with attendant increased income from students for housing and feeding.

² Ibid., p. 6.

EXHIBIT 12

COMPARISON OF PROJECTED INCOME WITH ESTIMATED
OPERATING EXPENDITURES UNDER CONDITIONS OF MINIMUM
ENROLLMENT IN INSTITUTIONS OF HIGHER EDUCATION, PENNSYLVANIA
1958, 1964, and 1970

Millions of Dollars



See Appendix C, Table 10 for supporting data

Note: A substantial increase in state aid will be necessary. However, so as not to distort the real difference between expenses and income from other than state sources, the amount of annual state aid shown on the chart is held to the current figure of \$40 million in 1964 and 1970.

The gap between predicted income and predicted costs represents the magnitude of the problem facing Pennsylvania, even if no effort is made to attract additional students to our colleges and universities. The largest single factor in the increased cost and hence in the gap between expenditures and income is increased faculty salaries,

Exhibit 13 adds to the preceding chart the factors of additional students coming to our colleges and universities as a result of our having met a challenge to increase opportunities for higher education to those of our youth who deserve such education and from which society will benefit.

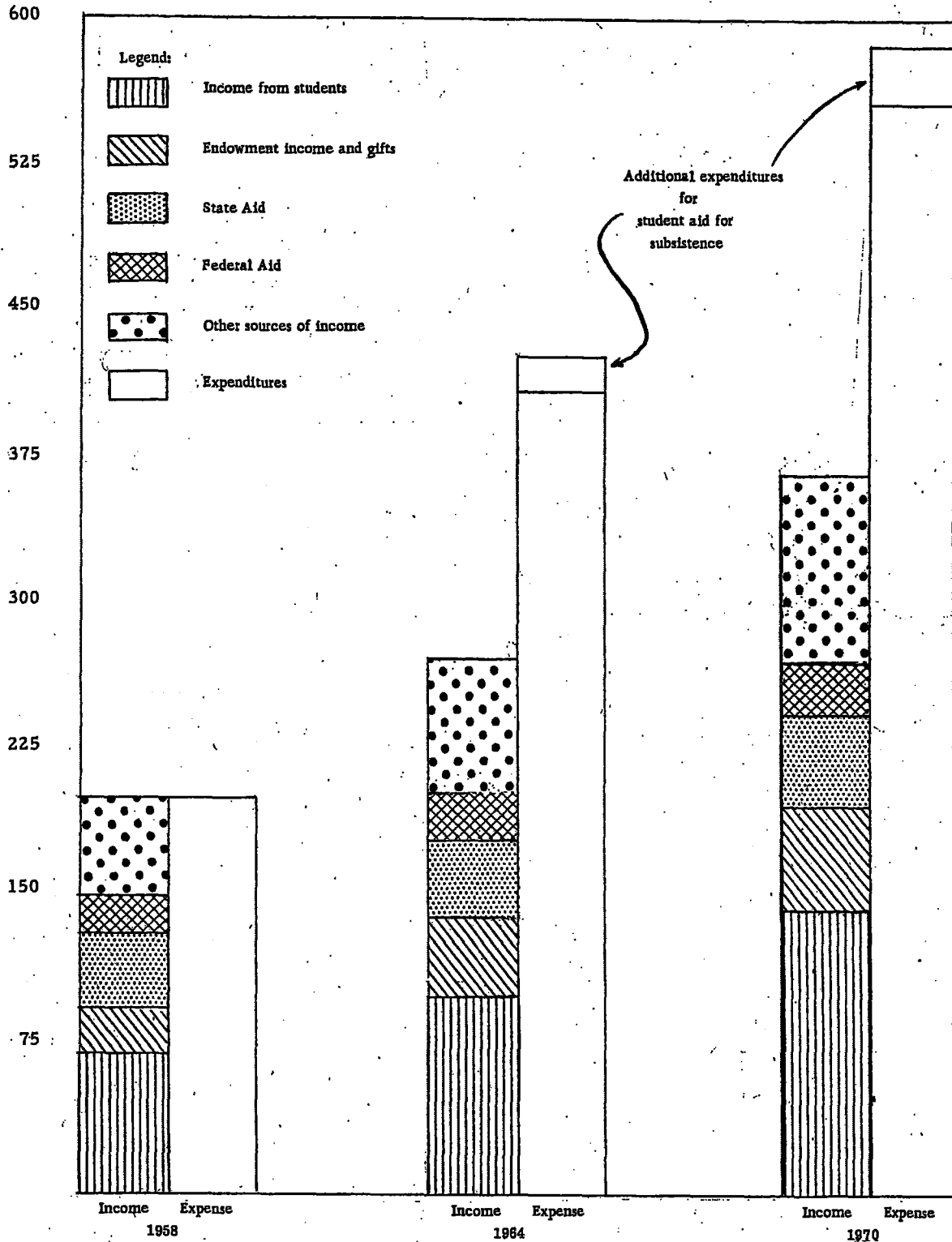
The total operating income is only slightly higher than that predicted under conditions of minimum enrollments. (Exhibit 12) No additional tuition income can be expected except in the form of student aid, since the additional students for the most part will be those whose counterparts today cannot afford to pay for higher education. (This kind of income has been ignored, since, if it were included, a like amount would be added to expenses.) There will be increases in income from gifts and from dormitory rentals and meal sales. Gift income may be expected to increase slightly because of the additional alumni created through the expanded program. Additional income from housing and feeding, equalling only one-half of the additional cost, is estimated to be received from the added students.

EXHIBIT 13

COMPARISON OF PROJECTED INCOME WITH ESTIMATED OPERATING EXPENDITURES UNDER CONDITIONS OF MAXIMUM ENROLLMENT IN INSTITUTIONS OF HIGHER EDUCATION, PENNSYLVANIA

1958, 1964, and 1970.

Millions of Dollars



See Appendix C, Table 11, for supporting data

Note: A substantial increase in state aid will be necessary. However, so as not to distort the real difference between expenses and income from other than state sources, the amount of annual state aid shown on the chart is held to the current figure of \$40 million in 1964 and 1970.

This additional income will offset the additional costs of an expanded program only in part, so that the basic financial loss becomes larger. Further, a new requirement of income to pay for the costs of student aid for subsistence is introduced.

A study of the major items of expenditures by students other than tuition and fees for 1952-53 shows the total of such expenses in public institutions to be \$1,242 and in private institutions \$1,474.³ More current figures indicate that there have been substantial increases in at least some of these items since 1953. For instance, the cost to the student for room and board in Pennsylvania in 1956 is reported for varying kinds of institutions as follows:

Cost of Room & Board - Pennsylvania Institutions, 1956⁴

	<u>Public University</u>	<u>Private University</u>	<u>Teachers College</u>	<u>Liberal Arts College</u>
Men	\$762.00	\$690.00	\$493.00	\$570.00
Women	\$780.00	\$702.00	\$493.00	\$664.00

These figures compare to the national average in 1952-53 of \$484 for board and room at public institutions and \$598 for board and room at private institutions in the study mentioned above. It should be

³ U. S. Office of Education, Costs of Attending College, Bulletin 1957, No. 9, Washington, D. C., p. 40.

⁴ U. S. Office of Education, Higher Education Planning and Management, 1957-1958, Washington, D. C., 1958

noted in passing that the low rates at Pennsylvania teachers colleges suggest that sources of income other than student payments are helping to pay the cost of room and board.

The factor of living costs is often said to be less if the student lives at home. Actually, these costs continue to be absorbed into the family expenses and remain very real but hidden expenses.

We have recognized the fact that national averages of subsistence may be high for the kind of student aid program we are suggesting because they apply for the most part to the student who receives little or no aid. For purposes of prediction, we have assumed an average annual cost to students of both sexes for items other than tuition and fees at \$1,000 per year. This very conservative estimate attempts to give weight to differences in costs among the different kinds of institutions in Pennsylvania and, at the same time, assumes that the student who receives aid will live a frugal existence.

We further assume that the average student receiving aid can through employment earn at least one-half of this total cost. Therefore we predict a need of \$500 per student for aid in paying living costs for those additional students whom we wish to attract to college because of their superior ability and the contribution they can make if they receive the proper training.

THE FINANCIAL
GAP

Our predictions indicate a growing financial gap between income and expense. We think this will occur even if no steps are taken to

increase the nation's human resources by attracting additional worthy students. Under this assumption, the gap in 1963-64 is estimated to amount to \$92.9 million; by 1969-70, this will have increased to \$132.9 million.

If efforts are made to attract students who now have no opportunity or no motivation for college or university training, the gap is estimated to be \$138.6 million in 1963-64 and will increase to \$189.5 million in 1969-70. In addition, under this assumption \$19.5 million will be needed in 1963-64 for direct student aid to carry one-half of the living costs; and \$29 million will be needed for these purposes in 1969-70. In total, this amounts to \$228.0 million or \$645 per full-time-equivalent student in 1970. In addition, consideration must be given the funds needed for capital expansion estimated in Chapter III at \$564.3 million to \$763.0 million.

SUMMARY OF
FINDINGS

The Panel has now established that higher education is facing a crisis of the most serious proportions in our history. The crisis of ever-increasing pressure for admission to our colleges and universities is compounded by the competition with international communism. The Panel has noted an increase in college-age population in Pennsylvania between now and 1970 of 45 per cent. The growing rates of persons completing high school and persons desiring college training have been measured, demonstrating that not only will there be more people in the 18 to 21 year age group, but also that a higher percentage of this group will want to enter college. Even so, the Panel is alarmed at the large, untapped

group in Pennsylvania of young people with high intelligence who now are not motivated for professional training. Among the June 1958 high school graduates this group was estimated to number 21,670. The Panel recommends that efforts be made to attract more of this group. In quantitative terms, the Panel predicts an increase of 158 per cent in total enrollment by 1970, calling for facilities in our colleges and universities to teach 443,000 undergraduates and graduates. The Panel further recognizes that the proportion of graduate and professional students is growing and that education for these students is many times more costly than for undergraduates.

Using existing standards, Pennsylvania will need 20,400 new college faculty by 1970; but only 50 per cent of this need can be supplied unless more persons are attracted to become teachers. To attract 50 per cent of the new faculty required, salaries must be increased, recruiting must be actively pursued, preparation time reduced, and the prestige of the profession increased.

Libraries in Pennsylvania will need to be expanded by 6,300,000 volumes in the next ten years.

Administrative staff will increase substantially under pressure of increased enrollments and faculty shortages.

Operating expenditures will reach a peak of \$559.2 million in 1970, a 175 per cent increase over 1958.

Expansion of existing present facilities will require investments

of at least \$953.7 million in the next decade, of which \$399 million will be needed for dormitories.

If there are no appreciable increases in tuition rates or in the amount of government aid, income will not keep pace with rising costs. A deficit in the operating budgets of our institutions of higher learning of \$228.0 million a year is predicted by 1970, if educational practices in Pennsylvania continue without substantial changes in objectives, methods, and sources of support.

The magnitude of this crisis demands a fundamental reappraisal of the system of higher education in Pennsylvania by each element of the system -- the faculties, the institutional administrators, parents, students, alumni, business, the secondary schools, and the government. In the next chapter, the Panel outlines guides for this reappraisal and offers concrete suggestions for action in the immediate future.

CHAPTER V

Meeting the Crisis in Higher Education

The Panel has presented a sobering prospect for higher education in Pennsylvania in the years immediately ahead. Means must be found to meet the estimated annual operating deficit of \$228.0 million and to provide additional capital plant which will cost almost \$763.0 million. Although the solutions to the problems are not easy, solutions do exist. In this Chapter the Panel will offer guides for their accomplishment.

Above all, it is imperative that all groups and all individuals who play a role in the process of higher education re-examine their objectives, methods, attitudes, and social values. Such a reappraisal must be undertaken with a spirit of willingness; old habit patterns must be put aside and fresh cooperative approaches applied. These recommendations are in many instances mutually dependent on one another, and all should take place concurrently and immediately. We must stress, however, that none of the solutions can succeed unless we have a strong economy in the Commonwealth. The parents, students, alumni, faculty, business, the state government -- each of the elements of the educational process can meet its share of the responsibility only if the economy of the state and nation is sound.

The secondary schools of the Commonwealth have a primary responsibility in solving the problem of higher education. First, since it is in the high school and the junior high school that motivation to attend college receives its greatest impetus, the secondary schools must play a leading role in identifying the student who is qualified for advanced training. In Chapter II, the Commonwealth's failure to attract qualified students to higher education is discussed. A survey of 10,000 Pennsylvania high school seniors indicates that 58 per cent of our high school seniors who are qualified to go to college do not go because of lack of finances or lack of motivation.¹ The problem of providing financing is discussed subsequently in this Chapter. To provide motivation specific action must be taken.

The search for the talented in the secondary school must not be a passive one, largely relying upon psychological testing and counseling those students who seek advice. Rather, it demands a positive approach.

¹ Pennsylvania High School Seniors, 1958. Their Mental Ability, Their Aspirations, Their Plans, preliminary statement prepared for the Advisory Panel on Study of Problems of Advanced Training by the staff of the Joint State Government Commission, Harrisburg, September, 1958. This finding is supported by a survey of almost 2000 high school juniors and seniors in ten rural northwestern Ohio counties. Although the students were not rated as to intelligence, they were asked whether they wished to attend a college or university, reasons which would prevent attendance, parental attitudes. The report notes: "More than half expressed a desire for a college education. It is probable that almost 40 per cent of these students will not enroll in college because of a lack of a continuing source of motivation and plausible plan for solving the attendant economic problems. If these two factors were corrected, it is probable that an additional 20 per cent of those students expressing an interest would, in fact, enroll in college this fall." An Area Approach to the Science-Mathematics Teacher Problem, A Field Study, James Frey, The Defiance College, Defiance, Ohio, 1958, p. 10.

Every teacher should participate in identifying the qualified student, especially as the number of trained counselors needed to serve all secondary schools is not available nor likely to become available considering the supply and demand in the field. Counseling should not stop with the student; it should include the parent, who should be made aware of the importance of higher education not only to the child but also to the nation.

Educators should encourage advanced training not only for the student who is superior in all fields but also for the student who has superior ability in one field although he may have only average ability or below in others. This point is made by Dr. Paul Horst when he writes: "A person may show great differences in the extent to which he possesses various abilities and competencies. The gifted student could be a success in almost everything. But in real life he will not be doing almost everything; he has to choose between being a doctor or a lawyer or an engineer or a physicist. He can not be all of these things at once. Therefore, from the career point of view, the gifted student has no advantage over the student who has special talents in a single area. And there are vastly more students who have special abilities in one or two than those who have high ability in all areas."²

² Paul Horst, "Differential Prediction in College Admissions," College Board Review, Fall 1957, No. 33, p. 19.

Higher education must be encouraged for the qualified. On the other hand, it is equally important in this time of crisis for those without aptitude to be led in some other direction than to the college and university. Both the survey made of Pennsylvania seniors referred to above and Wolfe's study³ show that even among high school seniors with the lowest grades and with the lowest intelligence rating there are some who wish to enter college although only a small portion of them actually graduate. Students who have aspirations to attend college, whatever their grade level, must be permitted to compete for college attendance. However, among these students who have less than a 50 per cent chance of graduating down to those who have almost no chance at all, efforts to instill a wish to attend college will lead to frustration for the individual and over-crowding of university resources.

A more successful counseling program will require highly trained counselors. The institutions of higher education must develop graduate curricula especially designed for counselors. Much research in the field of adolescent motivation is needed in designing and implementing such curricula.

The second positive action the secondary schools can take to accomplish their part in solving the higher education problem is the encouragement of the large comprehensive or differentiated high schools.

³ Dael Wolfe, America's Resources of Specialized Talent, N. Y., Harper and Brothers, 1954.

The Commonwealth has made strides in this direction but much remains to be done. Small high schools throughout the state should wherever possible be consolidated into larger schools, where greater specialization of curriculum will become possible. On the basis of aptitude, the student has the option of preparing himself for a college or university career or of taking intensive training in technical and vocational subjects.⁴

Hollinshead compares the large comprehensive high school to a multi-lane highway. He says: "Perhaps the most important contribution such a highway makes is that it provides the opportunity to continue from wherever one is . . . nearly all may go as far as their ability, resources, and motivation can take them, and this system encourages a larger proportion of young people to go on to college than a more narrowly presented or rigorously differentiated structure would."⁵

Third, the college preparatory work in the comprehensive high school should be made more intensive than is usually the case today. This will have two major effects. First, it should permit the teaching of basic academic skills in the secondary school rather than in the first and second year of college. Far too much time is spent in most colleges training students in essentially secondary school subject matter. By making the high school curriculum more effective, the college will be relieved of a

4 The desirability of advanced training in special technical and vocational schools beyond the high school is worthy of further exploration. However, the Panel has excluded this aspect from its study, believing that its main objective is to consider the problem of college and university education.

5 Byron S. Hollinshead, Who Should Go To College, N. Y., Columbia University Press, 1952, p. 9.

vast amount of low-level instruction and can concentrate on the increasingly complex subject matter of college courses.

To accomplish this end, the school systems, the colleges and universities, and the Commonwealth have a mutual responsibility. The level of college preparatory training in the secondary school will be raised only if the capacity of secondary school teachers and principals is broadened. The responsibility for improved training of teachers and principals starts with the college and university, but each school system in making appointments and promotions, and the Commonwealth in setting teacher certification standards, share in this responsibility.

Many secondary schools are ill-equipped in such basic resources as libraries and laboratories to offer fully effective college preparatory programs. These shortcomings should be remedied.

Intensification of college preparatory training requires intensification of student effort. The student must learn to do more and, very importantly, to do more himself. A far greater proportion of the high school student's time outside the classroom must be devoted to independent study, in short, homework. As is subsequently stressed, the schools have a right to expect the parents to join in an effort to make the student self-reliant.

That it is feasible to prepare secondary students more adequately is apparent from the experience of colleges and universities with students who received their secondary school training in other countries. Students from Canada, the United Kingdom, Germany, France and other countries

come to American colleges with substantially better backgrounds than those who have received their high school education in the United States.

The second advantage of more intensive training is that it will help identify those who lack real ability or desire to continue their education in a college or university. Through this means the colleges will be relieved of training the unqualified or the disinterested. This action will be of benefit to those who are found to be deficient as college material. They will be in a position to receive a good technical or commercial education with a minimum of lost time in curricula for which they lack ability or interest.

THE
PARENT

In view of the vastly increased costs of education which are upon us, the parent, in planning a college career for his son or daughter, must change his attitude with respect to the amount of his personal resources which he is willing to apply to a college education for his child. Wherever the financial ability is present, the parent must be prepared to undergo greater sacrifices and to pay a fairer share of the cost of college education than he is asked to do today. Until families are asked to undertake these sacrifices, it is difficult to assess the resistance which will be encountered.

As was stated in Chapter I, the per capita cost of higher education might well be considered in relation to what the American people are spending on other services and commodities. Compared with annual per capita expenses of \$24.50 for higher education by the people of Pennsylvania, nationally the American people are spending each year over \$85 per capita

for tobacco and alcoholic beverages; \$79 for recreation; and \$87 for automobiles. Possibly a major change in values will be necessary. It is incumbent upon all elements to bring to the attention of the parent the importance not only to the welfare of his child, but to the nation, of increasing the amount of support for higher education coming from the family. It is not a satisfactory answer to turn to the state to assume the burden of educating a child who comes from a family economically able to pay for a child's education.

Also, many parents must change their attitudes toward the education of their children while they are still in secondary school. It is here that scholastic work habits are formed, that self-reliance must be encouraged. Parents often fail in their responsibility to make it clear to their children that learning is a process accomplished chiefly through hard work. It must be intensely frustrating to a conscientious teacher to receive an irate parent protesting that his child has been given too much homework.

THE
STUDENT

First, with the shortage of faculty the student must assume greater personal responsibility for his own education. Many faculty members advocate, and the Panel concurs, that the role of the faculty be changed from a position of educating the student directly to a position of leadership in pointing the way for self-education. This would mean that the teacher would spend less time expressing facts and concepts for the student to memorize and repeat in examinations. Instead, he would set

forth problems for the student to resolve through independent reading and thought. The teacher would give guides for the student and criticize his methods and results, but education would be gained essentially through student effort. Such a change in educational method is possible only if the student has developed habits of self-reliance as part of his preparation for higher education.

Clarence H. Faust has suggested greater emphasis on making students "self-starters" in their intellectual development. One technique for reducing the number of hours of formal class instruction would be to have the students spend several weeks in intensive reading early in the term followed by some weeks of class discussions. Conversely, the students could spend some weeks in classes formulating problems and absorbing techniques for attacking them followed by independent study which would utilize these methods.⁶

There is nothing new about self-education; European universities have with good effect for centuries assumed that students have initiative, ability, and independence. The tendency in our country has been to encourage student dependence on faculty for every step in the learning process.

The elimination of spoon-feeding the student will be of benefit to his own intellectual development and will make it possible for faculty to

⁶ "Rising Enrolments and Effective Use of Faculty Resources", Association of American Colleges Bulletin, Vol. 43, May 1957, pp. 257-65.

to guide and assist greater numbers of students. A move in this direction should be taken whether or not we face a crisis in education.

Second, the student must be willing himself to assume a greater financial burden. This applies to the many students whose families, even after maximum sacrifice is made, still cannot support the full amount of the cost of higher education. Such students must be prepared to pledge a part of their future earnings in order to achieve a college education. In a subsequent part of this chapter, a plan for an extensive loan program is discussed. This program will call for greater willingness on the part of the student to borrow funds for his education.

E
UMNI

The alumni must recognize more than ever before the obligation they have for the benefits received from their college education. The benefits of higher education to the individual transcend by far the immediate costs to the individual even when those costs are computed at their maximum. It has been estimated from 1949 income figures that a college graduate earns in his lifetime at least \$100,000 more than a high school graduate.⁷ It is only right that the alumnus be expected to contribute generously from his earnings which are high by reason of his having received an education,

⁷ Paul C. Glick and Herman P. Miller, "Educational Level and Potential Income," American Sociological Review, Vol. 21, No. 3, June 1956.

Seymour E. Harris estimates the lifetime earnings of a college graduate to be \$200,000 to \$250,000 greater than those of a non-college graduate. He estimates the lifetime income of a physician graduating in 1958 to be \$1 million or more. College Education on the Cuff: The Case for a Loan Program, paper before annual Meeting of College Entrance Examination Board, October 28, 1958, p. 4.

particularly when he realizes that whatever he paid for his education was far below what it actually cost his institution. The record of alumni giving has not been good. Although there are many instances of alumni who have given generously, by and large the alumni of our institutions of higher education show apathy toward support of their colleges and universities.

A national study⁸ has revealed that only 12 per cent of the alumni make contributions to their colleges. The average contribution in 1957 was about \$12, and this average is from figures which include extremely large gifts from a few individuals. In Pennsylvania the record is better, but still not sufficient to warrant enthusiasm. Of the total alumni of 74 Pennsylvania institutions, 20 per cent made contributions amounting on the average to \$17 in 1957. Of all sources of voluntary support, alumni giving throughout the nation showed the smallest increase between 1954-55 and 1956-57. For instance, whereas corporation giving increased 82 per cent in this period and government support increased 80 per cent, alumni support rose only 20 per cent.

Clearly, the alumni must assume a fairer share of providing financial backing to their institutions.

**THE BUSINESS
CORPORATION**

As is documented in Chapter IV, the business community has begun to recognize its obligation for the support of higher education, and

⁸ Figures in this paragraph are adapted from data given in Council for Financial Aid to Education, Inc. Voluntary Support of America's Colleges and Universities, 1956-57, New York, N. Y., April 1958.

it is anticipated that this support will become increasingly important in the next decade. However, colleges and universities and all other elements of the educational process should be untiring in their efforts to bring this responsibility to the attention of all business. Corporate giving of all kinds is still far below the 5 per cent tax deduction allowance permitted by the tax laws. In 1955 it was only 0.87 per cent of net profits. In the decade ending in 1955, corporation giving of all kinds averaged 0.84 per cent of net profits annually, being higher in some years, but dropping off as excess profits taxes ended.⁹ The Advisory Panel urges all businesses to plan regular contributions to higher education as a recurring expense, either as part of operating budgets or as payments to educational trusts. With the acceptance of such a plan, it is possible that business support of institutions of higher education will increase even beyond that estimated by the Panel in the previous chapter.

THE COLLEGE There are many steps which the institutions of higher learning
THE UNIVERSITY
AND THE themselves and the faculties which constitute them must take if we are
FACULTY
to be successful in meeting the crisis.

It is the college and its faculty which must take the lead in the reappraisal. In fact, it is they who have a primary responsibility to all other elements of the process of education to put their own house in order before expecting reforms or sacrifices from other groups or individuals

⁹ F. Emerson Andrews, Corporation Giving, N. Y., Russell Sage Foundation, Inc., 1952; U. S. Treasury Department, Statistics of Income, Washington, D. C.

First, all institutions must re-examine their present admission standards. It is important to the education of those who are qualified that resources are not wasted on those who lack either ability or desire. The selection process at each college and university should admit only those persons with a clearly reasonable chance of success and those who have a positive desire to learn. This does not mean that standards should be set so high as to exclude all but the most select group. The Panel does not believe that we can solve the crisis in education by simply continuing to raise admission standards so as to include an increasingly smaller percentage of our qualified young people. Such an approach would result in a serious waste of national assets. On the other hand, this proposal does mean that we may cut the cost of education by not expending resources on those who are not qualified or on those whose motivation is weak.

It is widely accepted that persons with an IQ of 104 and below have less than a fifty-fifty chance of completing college. Large numbers of students, especially in the first year or two of college, are in this category and many rank in the lowest categories of intelligence measurements. Wolfle presents figures which indicate that in the United States 23 per cent of the students entering college have IQ's of 102 and below. He also shows that over a third of the students entering college have IQ's of 107 and below.¹⁰

¹⁰ Wolfle, op. cit.

These percentages are roughly supported by the results of an examination used widely by colleges and universities throughout the United States.

Thirty per cent of the college freshmen received scores approximately equivalent to an IQ of 104 or below.¹¹ Interpolation from data for Pennsylvania on the Selective Service College Qualification Test, a test used to determine draft exemption for purposes of continuing college, shows that between 7 and 11 per cent of male students at all levels (freshman through senior) have IQ's below 107.¹²

To accomplish a raising of standards there must be mutual agreement among the institutions of higher education in the Commonwealth as to the minimum qualifications required for entrance into and retention in college programs. Only in this way can we avoid having institutions apparently devoted to higher education but composed essentially of rejects from other schools.

The second major step to be taken by colleges and universities is to lay plans to attract additional persons to teaching careers. Additional men and women must be added to our faculties if we are to meet the tide of increased enrollments. The need for substantially higher salaries to faculty is recognized in Chapter III and is recommended strongly by the Panel. This will constitute a major part of the increased costs. But the

11 Data from American Council of Education Psychological Examinations

12 Preliminary Statistical Report on the Selective Service Qualification Test, July 1951, Educational Testing Service, Princeton, N. J.

raising of faculty salaries alone will not be enough. All institutions of higher education must undertake active recruiting programs. For such programs to succeed the prestige of the college professor must be increased. The universities themselves can aid materially in this effort by giving greater emphasis to programs of preparing college teachers. The recognition of college teaching as a profession to be prepared for directly, and not simply as a by-product of scholarly work in a given field, should be actively pursued. Along with efforts to build up their own faculties, colleges and universities must assist in recruiting qualified secondary school teachers.

Programs must be initiated in close conjunction with business, government and other agencies to integrate educational programs which are of mutual interest and mutual benefit. To increase the number of persons who will teach college classes, the universities must draw upon outstanding men whose principal endeavors are in outside pursuits. The exposure of the college student to the active professional man has benefits which go beyond the lecture to a class. This advantage has long been recognized in the field of medicine, where the practicing physician plays an important part in all clinical teaching programs.

Another step of major importance in increasing numbers of teachers is the reappraisal of requirements for the doctoral degree. Too often the graduate student striving to attain a doctorate finds himself faced with a series of vaguely stated requirements and artificially set numbers of

credits which he must earn. The Committee on Policies in Graduate Education of the Association of Graduate Schools called the road to the Ph.D. "tortuously slow and riddled with needless uncertainties."

They recommend that the whole program (except in the most unusual cases) take no more than three years of residence whereas now it generally takes four years and more often six or seven and not infrequently ten to fifteen.¹³

Too often the graduate student is distracted from his main object of attaining a degree by encouragement to perform more and more service to the university as a student assistant, a research technician, or a clerical aide. These distractions lengthen materially the time required to obtain a doctorate, and in the long run the university loses manpower. It is recognized that the graduate student is often forced into this course of action because of economic need. The economic need should be met by some other means, and the graduate student freed to pursue directly a course leading him to qualifications for full-time advanced teaching.

But, as is pointed out in Chapter III, even though all of these steps and others are actively pursued, there will be an acute shortage of faculty within the next five years. In solving this problem, the college and university must take a third major step -- that of increasing the effective utilization of the faculty. Some recommendations follow:

¹³ Report of Committee on Policies in Graduate Education, Association of Graduate Schools, October 1957.

1. Improved utilization of classroom hours:

- a. Junior instructors should be used to supplement the teaching by the most qualified faculty who, in turn, would teach more courses.
- b. Educational devices such as television, radio, audio-visual aids, etc., should be used to expand the number of students taught by one instructor.
- c. Continuing research should be carried on to develop techniques to assist the learning process. These could be both improvements in devices now being used and creation of new techniques for learning, such as the learning machine which B. F. Skinner has developed at Harvard.

2. Increase in student self-education:

- a. Perhaps the most hopeful change would come from greater reliance on student self-education through increased use of reading courses, independent study programs, or other techniques to reduce length of time in class.
- b. Students with superior ability should be encouraged to qualify by examination for many subjects which now require long hours of classroom work.

3. Curriculum changes:

- a. Highly specialized courses should be eliminated and combined courses, which would provide opportunities for specialized work within the framework of a general course related to several specialized fields, be substituted.
- b. Efficiency of use of faculty time would be improved by elimination of unnecessary or duplicating courses in closely related professional fields or in related disciplinary and professional fields. Most faculties will admit that many courses are being offered today which have no educational validity but are continued for a variety of historical reasons or to solve a problem of personal relationships.

4. Administration:

- a. In many institutions faculty members find their time taken up in a labyrinth of committees, often overlapping in purpose or without a definite objective. Faculty should be freed from such burdensome committee assignments on matters which do not demand their special competence or which are difficult to conclude by committee action.
- b. A substantial amount of administrative and clerical assistance given every academic department will relieve faculty members of such chores as grading factual examinations, filing and record keeping, report writing, typing and duplicating, registration assignments, and others. It is recognized, however, that faculty will continue to spend time with students outside the classroom in guidance and assistance and that this function should not be taken over by staff no matter how competent.
- c. A continuing management survey group should assist university administration in achieving maximum utilization of faculty time for academic purposes.

All of these devices and others should be employed with the view toward increasing faculty utilization without the loss of quality of instruction.

A study of the most effective measures must of necessity be conducted in each institution by its own faculty. The problem is too complex to apply remedies by regulation or fiat. Of most importance in this endeavor is a sincere willingness on the part of the faculty to assist in meeting the problem.

The Panel rejects the suggestion often heard that the faculty member teach more hours per week. The Panel believes that current loads of faculty members are generally too high to permit the kind of quality instruction which makes a college education worthwhile. On the

other hand, the Panel believes that the faculty-student ratio can be changed in the direction of having more students per faculty member without increasing the direct time load on each faculty member.

We would add that a faculty member, deeply interested in students, who wishes to and is able to teach more than the normal load at his institution, should be permitted to do so. We know of too many instances where faculty members hold teaching appointments at more than one institution because of arbitrary limitations on teaching load at each.

Further, research activities of faculty should not be curtailed and opportunity to undertake research should be available to those faculty members not now so engaged. This aim is in no way incompatible with that of a faculty's teaching more students. The faculty should be freed from nonacademic pursuits and utilization of classroom hours should be maximized. If the above techniques and others could be implemented to achieve these ends, the scholarly aspects of the environment could be improved and the opportunities for research and advancement of professional competence could be at least as great as at present.

In addition to finding ways to improve the utilization of faculty time, institutions of higher education must improve use of other resources. Here is the opportunity for a fourth major action by colleges and universities. The known and effective steps for improving organization, lines of communication, administrative procedures, and financial control -- in short,

management -- must be adopted and embraced tolerantly and cooperatively by the faculty as well as the institutional administration.

A fifth step of crucial importance is for institutions to improve the utilization of their present physical facilities and to build new facilities with maximum utilization in mind. Improvement of space utilization can be accomplished.¹⁴ Schedules can be designed to effect maximum student class-days. Saturdays and evenings can be utilized to extend the time the plant is occupied. Class sizes can be increased by closer control of sections and by permitting over-enrollment in classes to the extent of known attrition. Proper assignment of two hour and three hour classes will accomplish better utilization. These must be scheduled throughout both the morning and afternoon rather than being concentrated in the morning. Three hour courses should be held on Tuesday, Thursday and Saturday as well as on Monday, Wednesday and Friday. Two hour courses should be concentrated on Tuesdays and Thursdays. Each of these measures can be applied to the traditional two term school year, but a more significant contribution to utilization of physical plant can be made by acceleration of the entire academic calendar so as to keep the plant in use throughout the year.

¹⁴ An excellent guide for a university conducting a space utilization study is Manual for Studies of Space Utilization in Colleges and Universities by John D. Russell and James I. Doi, American Association of Collegiate Registrars and Admissions Officers, 1957. This Manual includes forms and procedures for collection of data and for the analysis and interpretation of data.

Although each of the recommendations offered above should have a significant effect upon the increase of income to higher education, upon the reduction of cost, or upon lessening the need for physical plant, the Panel believes that a sixth major advance to be made is a change in the traditional academic calendar. Most institutions today conduct two sixteen week semesters plus two weeks for examinations and grading as their principal educational offering. In addition, some institutions offer summer sessions which are designed largely to give educational opportunities to elementary and secondary school teachers or to permit students to make up work which ordinarily would be taken in one of the regular semesters. Therefore, it is apparent that the physical plant and the administrative overhead of most institutions require expense over twelve months each year, although the institution is productive only 65 per cent of the period. The Panel suggests that educational institutions explore means of utilizing the plant and the staff for a longer period of time each calendar year.

One possibility known as the trimester system has been developed at one Pennsylvania university. The trimester plan calls for three fifteen week terms each year plus three for examinations and grading. Thus, the institution is in operation, carrying out its primary functions, for a period of 48 weeks or 92 per cent of the year. Under this system, a student can complete a traditional four year, eight semester program of undergraduate work in two and two-thirds calendar years. In the trimester system not only is the plant and the staff of the university more effectively utilized, but there also is a marked reduction in cost of training a student and :

nificant savings in the time period wherein he reaches the point of employability in his chosen professional field.

Exhibit 14 charts the possible effect of the use of the trimester system on the enrollment to 1970. For comparative purpose, the chart includes the curve for full-time-equivalent student enrollment used in Exhibit 6.

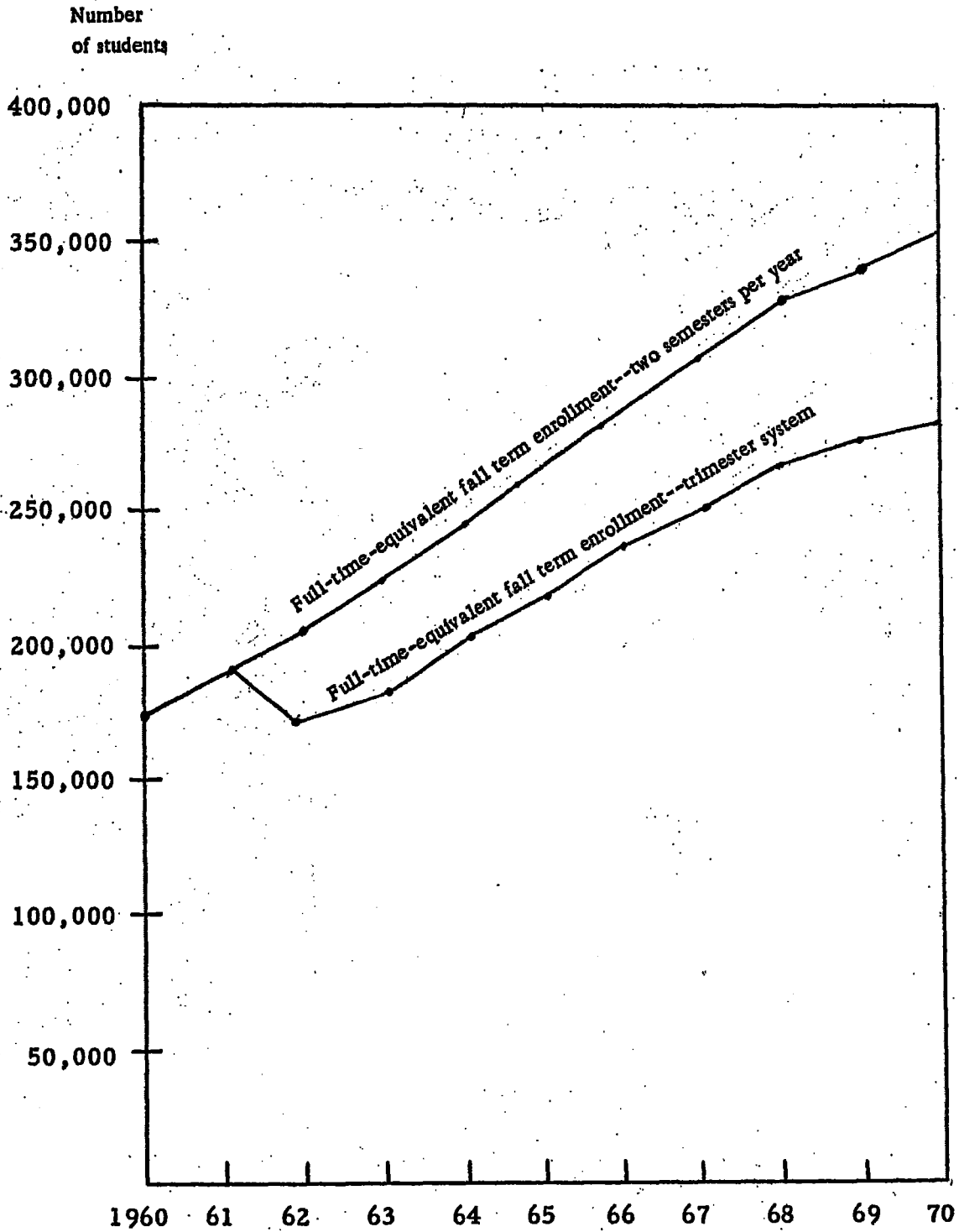
This chart assumes the trimester system is placed into operation with the entering class of September 1959 and that full advantage is taken of the program throughout the Commonwealth. This should not be considered a prediction but a demonstration of what is possible. Details of the calculations are given in Appendix B.

The chart reveals that within the maximum enrollment assumptions, the trimester system can reduce the number of students attending college at any one time by about 20 per cent. At once, it becomes clear how important this can be with respect to the need for increased physical facilities.

In Chapter III, it is estimated that capital costs for physical facilities would require \$763 million if the present two semester calendar were retained even though the most stringent efforts were made to improve utilization of space. Nearly a forty per cent reduction in this requirement can be made if universities operate the year around by following some such plan as the trimester. Thus, a saving of over \$300 million in capital

EXHIBIT 14

COMPARISON OF FULL-TIME-EQUIVALENT FALL
TERM ENROLLMENT UNDER TRIMESTER SYSTEM
WITH PRESENT SEMESTER SYSTEM
1960-1970



plant costs can be projected under a trimester system. Further, it is possible, if the trimester plan were quickly adopted, to forestall completion of major expansion until 1964, since major enrollment increases will not occur until that year.

In addition to savings in capital costs, the trimester system will result in significant improvement in the relationship of operating income and expenses. All other assumptions remaining the same, the need for faculty to be present at any one time of the year is cut by 20 per cent. This estimated reduction in need will have no effect upon current faculties. It will mean simply that there will be need for less expansion of teaching staff. Further, it is recognized that no reduction in faculty need is possible in those disciplines where the summer now is devoted to full-time activity on research projects. This saving is slightly more than offset by the need for faculty for a third more of the year. Assuming that all the faculty is needed during third term, the net addition to instructional cost would be about 6.0 per cent. There would probably be no change in the items of administration, student services, library, research, organized activities, or other costs, but a 20 per cent reduction could be expected in maintenance, equipment, and other expenses. Because of the need for a longer period each year for housing facilities, a 6.0 per cent increase would be required in housing and feeding costs. The trimester system will have an overall effect of increasing projected

costs by only about one per cent. However, on the income side, tuition income at current rates may be expected to increase 20 per cent and "other sources" of income may be expected to go up by about 15 per cent because of increased revenue from dormitories and food services. In 1970, an increase of \$43.6 million would result with current tuition rates.

These gains are offset because it will be necessary to provide additional student aid for subsistence. It would be unreasonable to expect those students who must, under our previous assumptions, earn half of their subsistence, to continue to accomplish this while going to school eleven months out of the year.

In summary, using our maximum enrollment assumptions at present tuition rates, the net cost under the trimester system will be no larger than the net cost under the present calendar. However, since the important factor in these computations is tuition, any increase in the current rate would have a 20 per cent greater effect on income under a trimester system with no additional cost. Further, the effect is more marked if minimum enrollment assumptions are used because the increased cost of student aid for subsistence is not a factor.

We reiterate here that the aim should be around the calendar education and there are a number of ways of achieving it. Trimester is merely one of the means which could be used; the quarter system is another. Savings under any arrangement which accepts the basic principle could be

as great.

A seventh step is one which is implicit in each of the others. This step requires an acceptance of change by all parts of the college or university. The alumni must agree to observe with sympathy the process of change and not raise objections simply in the name of tradition. Governing boards and administrative officers should encourage experiment and evolution despite the effects these can have on the comfortable present modes of conducting the institution's business. But most important of all, the faculty must take the lead in bringing about and accepting new and improved ways of education. Some faculties have shown not only a willingness to accept change but also have taken a leading role in initiating and carrying through improvements in academic organization, curriculum, and methods. Other faculties have shown remarkable resistance to change regardless of the merits of a proposed modification of practice. No one group of a faculty should be permitted to stop necessary progress earnestly sought by their colleagues. Continuing staff offices, composed of persons with experience as faculty members, should work closely with faculties in making studies, analyses, and recommendations. The benefit of outside counsel should constantly be sought to promote objective reviews.

The Panel has set forth seven major steps to be taken by institutions of higher education in Pennsylvania. Each college and university should be expected to show evidence of having made a positive effort to progress along these lines, if it wishes support of the other participants in the educational process.

SUMMARY OF
OBLIGATIONS
OF ELEMENTS

If the recommendations of the Advisory Panel are adopted, significant improvements in the financial deficit can be expected.

Revised estimates of cost and income cannot be precise since they reflect many intangibles difficult of measurement. However, the Panel suggests the following as possibilities:

1. The efforts on the part of the secondary schools to perform effective counseling so as to encourage only the qualified to go to college, coupled with the efforts on the part of the universities to restrict admissions to those who are qualified and who have sincere motivation, might permit a downward revision of our enrollment estimates by as much as 10 per cent. This will reduce both cost and income, but since the principal effect is on the cost side, the projected deficit is thereby reduced. Such steps also will reduce physical plant requirements by as much as 20 per cent. To facilitate the accomplishment of this goal, further development of the comprehensive high school is urged.
2. If changes in attitude of parents occur, substantial tuition increases do not appear unreasonable. The effect upon improved income is obvious, particularly if the academic calendar is extended around the year.
3. If the student will assume greater responsibility for his own intellectual advancement, much faculty time will be saved, but perhaps more importantly, a better educational result will be achieved.
4. If colleges and universities become more effective in their appeal for alumni donations, and if alumni will become more conscious of their responsibility to their institutions, income from gifts will increase significantly.
5. We have already projected an increase of 100 per cent during the 12-year period from business and corporation giving; the Panel believes that increased recognition of the stake business has in higher education should result in an even greater increase.

6. The colleges and universities have obligations in seven major areas:

- a. Admission standards should be evaluated and raised where they now fall below unacceptable minimums.
- b. Additional faculty must be secured.
- c. The effectiveness and the utilization of the faculty must be markedly increased.
- d. Proven management techniques must be introduced to make every institution more efficient.
- e. There must be increased utilization of the physical plant.
- f. Around the calendar educational offerings should be made possible.
- g. Each part of the college or university -- the alumni, the governing board, the administrative officers, and most importantly the faculty -- must become willing to accept change as a necessity in meeting the crisis before us.

Each of these obligations if fulfilled will help solve the financial problem. But even with these savings, a major financial gap between income and expense will exist. To close this gap, assistance of the government will be required. An approach whereby the state can assist in carrying out its responsibilities toward higher education deserves further discussion.

VERNMENT
AID

Government aid could be obtained by direct appropriations of the state legislature or the Congress. This method of financing carries with it the undesirable effects of governmental support, such as a tendency

toward the loss of a private status and the possibilities of political or bureaucratic control of education. Further, the many denominational colleges of the Commonwealth would be precluded from a share in such aid. However, today the Commonwealth ranks 46th among the states in the amount of state aid per student for higher education. This position should be improved, particularly since the bulk of state aid goes to the four major universities, which are faced with the special problem of the substantially higher cost of educating graduate and professional students. If Pennsylvania wished to achieve a rank about midway among the states, assuming that all states increase their support as enrollments increase on the same per student basis, state aid should rise by 1970 from the present \$40 million per annum to about \$130 million a year.

Another means of obtaining governmental aid can also be achieved by such a device as granting tax benefits to families whose children are attending college. This latter method is worthy of further exploration. However, it is not expected that this will produce significant relief to the lower income groups. A more effective method of bringing about support to education from governmental sources in addition to direct state support is in the area of student aid.

**PROGRAM OF
STUDENT AID**

The following program sets forth the Panel's general position in this matter.

1. Tuitions at all institutions and for all curricula should be set at a rate high enough to cover whatever difference remains between expenses and income after all other measures are taken to reduce costs and increase income. This step should be taken at the Pennsylvania State University and at the State Teachers Colleges as well as at private institutions.

2. At the same time that tuition is increased, aid should be provided on the basis of the ability of the student and his family to meet the new tuition rate. Those who can afford to pay the new rate should be expected to do so. Genuine inability to meet any part of the new tuition requirements should qualify a student for receiving partial aid.

The granting agency, whatever it may be, should specify the general standards of need which form the basis for student aid. However, the administration of the aid program should be left to the individual institution. Under such an arrangement each institution may continue to choose its own goals, to determine its role in the total educational program, and to operate its own educational and administrative policies. At the same time, choice of the institution will be left to the individual; and, in turn, each institution will have the right to accept or reject students on the basis of its own admission standards.

Under this arrangement, the maximum amount of support through tuition is achieved without depriving any student who is genuinely qualified for higher training of an opportunity for a college and professional

The bulk of the student aid can only be met economically by an extensive program of loans. A loan program will have the major advantage of reducing to a minimum the amount of contribution which will have to be made by governmental authorities. Although the interest rate of the loan must be set low enough so that motivation is not inhibited, a sufficiently high interest rate should be established so as to encourage prompt repayment and to cover a reasonable percentage of bad debts. Thus, the ultimate cost to the state, ignoring again any inflationary effects, will be the loss of interest on its capital investment. Further, a loan program is controllable. In future decades if the need for student aid lessens, availability of loan funds can be restricted by adjustment of interest rates or by withdrawal of capital. Such a retrenchment action might be far more difficult under a scholarship program.

To be successful, a loan program will require intensive motivation on the part of the student. The student must be willing to pledge a portion of his future earnings. Further, there must be a change in values on the part of the parents. The use of credit to finance homes, automobiles, furniture, and washing machines is accepted as respectable and praiseworthy, while the use of credit to finance an education is resisted.

Seymour Harris, Chairman of Harvard's Economics Department, has estimated that today the average family owes \$3,000 for homes, television sets, etc., whereas loans for higher education amount to \$11 per student.¹⁶ The relative values of an education for our young people over those of

¹⁶ Harris, op. cit., p. 4

possessing material conveniences must be examined, and the former assume a higher level in our social scale. Although an extensive loan program may tend to defeat in some measure the goal of attracting students to college who are not now oriented in that direction, it will have the advantage of insuring that most college students are in school because of their earnest desire to acquire training and not because going to college will advance their social position or their parents' pride. Care must be exercised in planning a loan program so as not to penalize the graduate and professional student whose earning capacity will not begin until several years after he has completed his undergraduate work. Perhaps a major part of an expanded scholarship program should be applied to graduate or professional education.

If a loan program is made available to a student to be used at the institution of his choice, both state-aided institutions and those not now receiving state aid will be assisted.

APITAL RE-
QUIREMENT
OR LOAN
PROGRAM

The capitalization required for such a loan program will not be small. Assuming that the difference between costs and income after all recommended steps are taken still amounts to \$50 million a year by 1970, a capital requirement program may be estimated. In the following table, Exhibit 15, these assumptions are made:

1. The deficit to be met will grow evenly to \$35 million a year in 1964 and to \$50 million a year by 1970.

EXHIBIT 15

CAPITALIZATION REQUIRED
FOR STUDENT LOAN PROGRAM
(millions of dollars)

	Capital Outlay	Repayments	Cumulative Capital	Cost of Capital @ 3%
1960	\$ 7.0	\$ --	\$ 7.0	\$.2
1961	14.0	--	21.0	.6
1962	21.0	--	42.0	1.3
1963	28.0	--	70.0	2.1
1964	35.0	--	105.0	3.2
1965	37.5	1.1	141.4	4.2
1966	40.0	3.4	178.0	5.3
1967	42.5	6.9	213.6	6.4
1968	45.0	11.5	247.1	7.4
1969	47.5	17.3	277.3	8.3
1970	50.0	23.5	303.8	9.1

If the 1969-70 capital outlay remains constant in succeeding years, the cumulative capital requirement would level off in 1976-77 at \$376.0 million. At 3 per cent, the cost of financing would be at a rate of \$11.3 million per year.

2. Repayment will begin in the sixth year following the loan and will be made at the rate of one-sixth of the loan each succeeding year.
3. Interest charges will pay only for administration of the loans and for bad debts. Hence, interest income from the borrower is ignored in the calculations.

The impressive amount of capital required by these assumptions can be supplied by private sources, by federal or state sources, by private sources supported by state and federal insurance, or by combination of all these methods. A plan which relies on private capital has the advantage of calling for no governmental support but the obvious disadvantage of requiring a rate of interest payment which probably would defeat the major purpose of attracting as many qualified students as possible to the university.

It may be contended that placing a large debt burden on the newly graduated student is unfortunate because he is in the period of lowest earnings and is faced with the expenses of setting up his profession and his household. The Panel recognizes these difficulties but contends that the obligation for the debt should be shared by both the student and the parents. The latter, if they are convinced of the importance of higher education, should be willing to assume a major portion of the debt. They are at the peak of their earning capacities and their expenses are governed largely by the standard of living to which they aspire.

Dr. Harris in advocating a major loan program for higher education proposes a much longer term for repayment than that used in the example. He suggests a counterpart of a house mortgage loan, one by which future earnings of the recipient might be mortgaged for 20 or even 50 years.¹⁷

Some may argue that the loan program will discourage the education of women. However, a college education increases the contribution of the wife to the family, and female college graduates stay on the labor market for longer periods than those without a degree. These facts, coupled with a recognition of parental responsibility for the loan, should relieve this objection materially.

It is believed that the details of a financial plan for this loan program are beyond the scope of consideration by the Advisory Panel. However, it is urged that immediate steps be taken for a comprehensive study of financing possibilities which will lead to concrete action on the part of governmental bodies. The Panel believes an important contribution has been made through the enactment of the National Defense Education Act.¹⁸

Even with a loan program, some students from lower income groups will be seriously hit by the rising cost to the student of higher education. For this group a scholarship program should supplement the loan program.

¹⁷ Ibid.

¹⁸ Public Law 85-864.

Exhibit 16 summarizes the possible effects of the proposals made by the Panel on the operating budget for 1970 of colleges and universities in Pennsylvania.

FINANCING PLANT EXPANSION A need of \$763 million for capital expansion between now and 1970 has been detailed in Chapter III. Better standards for admission may reduce this requirement to from \$600 to \$620 million. Better utilization practices will provide further relief. As has been demonstrated, the trimester system or something similar can reduce the amount even more to from \$350 to \$375 million. A substantial portion of this need undoubtedly can be met by private donations. Unquestionably the balance must be made up from public funds.

For state-aided institutions, a part of this balance should be received by direct appropriations for capital plant, as is now being arranged through the General State Authority and the Governor's capital budget. The remainder of the need both at state-aided institutions and at institutions not receiving state aid could be met by borrowing. The debt service on the loans would be added to annual operating cost. This would increase the operating deficit, which would in turn be offset by further tuition increases. These increases would be paid for by students who would in some instances have to borrow a larger amount to meet their current educational costs. Thus, a portion of the new capital investment would be passed on to the students of the next three or four decades.

If one assumes (1) a need of \$375 million under a plan for eleven months' operation; (2) receipt of one-fourth through private benefactions, and (3) financing of half of the remainder by direct state appropriation, the need to be met by institutional borrowing would be about \$140 million. If this were borrowed for a period of 40 years at 5 per cent interest, the debt service to be passed on to the students would amount to about \$7 million annually or \$25 per student per year at the 1970 predicted enrollment.

METHODS OF PLANT EXPANSION The Panel identifies a crisis in higher education in the Commonwealth which to be met will require a fundamental re-examination of the

objectives and responsibilities of all participants in the educational process. The problem of financing higher education is great but it can be substantially reduced through improvements in faculty utilization; acceptance of greater responsibility by students, parents, alumni, and business; and by a basic change in the academic calendar.

One fact is clear. Expansion of the Commonwealth's facilities for higher education will be required. An examination of the possibilities suggests the following:

1. Creation of new colleges;
2. Extension of secondary schools into junior colleges; and
3. Expansion of existing colleges and universities.

The Panel does not look with favor upon the adoption of the first alternative, since the costs for the physical plant of a new institution are

significantly higher than expansion of the plant of an existing college or secondary school.

In considering the other two alternatives, the statistics in Exhibit 17 are pertinent. The Panel believes that the 118 institutions of higher education in Pennsylvania, over half of which have enrollments in excess of 500 students, may be ample on which to build for the decade ahead.

This can be determined only by an examination of the objectives of each institution and an indication of the extent to which each is willing to expand. Since the great majority of the essentially undergraduate institutions are denominational in character, state funds cannot be used directly in supporting their capital expansion. However, expansion is possible through private donations and through the use of credit, as previously discussed.

The Panel recommends that an appropriate agency be authorized at once to gather information on future plans of all institutions of higher education in the Commonwealth. If this survey reveals a willingness on their part to increase enrollments, the Panel suggests that efforts be directed toward making such expansion possible.

In addition, the Panel recommends the development of public junior colleges in those parts of the state which will not be adequately served by existing schools.

EXHIBIT 17

INSTITUTIONS OF HIGHER EDUCATION BY SIZE AND TYPE
PENNSYLVANIA, 1956

<u>Enrollment</u>	<u>less than 100</u>	<u>100-499</u>	<u>500-999</u>	<u>1000-4999</u>	<u>5000-9999</u>	<u>10,000 to 14,999</u>	<u>15,000 or more</u>	<u>Total</u>
Junior Colleges	2	12	1	--	--	--	--	15
Essentially undergraduate								
Men's Colleges	1	3	3	8	--	--	--	15
Women's Colleges	--	8	7	4	--	--	--	19
Coeducational Colleges	<u>1</u>	<u>4</u>	<u>19</u>	<u>12</u>	<u>1</u>	--	--	<u>37</u>
subtotal	2	15	29	24	1	--	--	71
Universities	--	--	--	3	--	1	3	7
Professional Schools	8	13	4	--	--	--	--	25
Total	12	40	34	27	1	1	3	118

Source: U. S. Office of Education, Education Directory, 1957-58, Part 3, Higher Education, Washington, D. C., 1958.

UNIOR
OLLEGES

As in many other states, the public junior college should be a local institution designed for capable high school graduates who wish to delay entrance into a full undergraduate college and for high school graduates who have marked aptitudes in technical or subprofessional areas. The junior college has a grave responsibility to those students who enter junior colleges as a means of obtaining the first two years of a college education. The quality of instruction must be at as high a level as would be found in a four-year college. If the level of secondary school instruction is raised as urged by the Panel, the opportunity exists for a genuine college program at junior colleges. Pennsylvania now lacks adequate facilities for the continuing education of high school graduates who wish to pursue a subprofessional career. Junior colleges can do much to remedy this deficiency by offering vocational training at a post-high school level. High school work for such students then can be broadened to include more emphasis on the liberal arts.

Public junior colleges should not be established at random.

They should be the outgrowth of careful planning which would give them the initiative and flexibility of local institutions and yet have a perspective and area of service far beyond the potentialities of individual school districts. The Panel recommends that legislation be enacted requiring the Department of Public Instruction, subject to approval of the State Council of Education, to prepare a state-wide plan of administrative areas and authorizing public junior college centers within each area. The Department should be guided

by such criteria as wealth, population, topography, potential enrollments, and existing facilities of colleges and universities within the administrative area to be served.

The Panel suggests that the units of government authorized to establish public junior colleges be limited to the school districts of Philadelphia and Pittsburgh, to whole counties, or to groups of counties. Designation of counties authorized to act individually and jointly and the combinations of counties should be a responsibility of the Department of Public Instruction according to predetermined criteria. Delegation of authority to operate public junior colleges only to strategically located cities, counties and groups of counties will avoid creation of new and overlapping administrative agencies and will simplify control of quality standards.

It seems important to the Panel to limit capital expenditures through use of existing buildings. This will permit the Commonwealth and its public junior college administrative areas to apply more funds to pay attractive salaries, to establish suitable libraries, and to provide essential equipment. Initially public junior colleges should be operated evenings, Saturdays, and summers in strategically located senior high schools. Construction of eight or ten room additions to these high schools might be necessary to provide a library and office space for administrative and full-time teaching personnel. Science, technical, and vocational courses would be limited until the laboratories and shops of area technical

available for operation by authorized boards of school directors.

Operating costs might be met through fees paid by students, state appropriations, and assessments against school districts for residents enrolled in the public junior colleges. The operating expenses are shared in New York State on the basis of one-third each from the state, the school district, and the student. California public junior colleges are free to the students. In view of the total requirements for higher education in Pennsylvania, public junior colleges might be financed by the Commonwealth paying one-fourth of the costs; the school district, one-fourth; and the student, one-half. The Commonwealth and the school district shares might be limited to a total of \$125 each per student to place some limits on the total expenditures from state and district sources. If public junior college enrollments grew to 100,000 full-time pupils, the cost to the state would be \$12.5 million a year. The cost to the school districts in which the students reside would be \$12.5 million also, or the equivalent of a one-half mill assessment on the market value of real estate in Pennsylvania.

STATE-AIDED
INSTITUTIONS

In charting its course of action, the government of the Commonwealth is in a position to guide the development of the Pennsylvania State University and fourteen state teachers colleges and to influence the role of the three state-aided universities, Pittsburgh, Pennsylvania, and Temple.

It is not feasible to supplement the work of the four universities by creation of new universities. The cost of building completely new physical

plants of the complexity required for a modern university would be prohibitive. To assemble library collections with the necessary reference books, original sources, and periodicals covering a period of years would be not only expensive but in some fields impossible. Most important, it is very doubtful that efforts to attract faculty of the necessary quality would be successful in a period of faculty shortage. The four existing universities form an excellent base on which to build for future needs, particularly the need for graduate and professional training. Steps should be taken to strengthen the current programs of existing universities rather than to expend effort on new universities. This will require substantially increased state support.

Steps should be taken to bring about closer coordination of the programs of the four major institutions, to reduce competition and duplication of course offerings, particularly at the graduate and professional level, and to help provide a basis for a more effective allocation of state funds. The Panel proposes the establishment of an informal council of the heads of the four universities to which the Commonwealth should look for an integrated plan for university education throughout the state and for recommendations for concerted rather than separate institutional action. The Panel has noted that the procedure for allocating total state funds among the four universities has not been based on an evaluation of relative need or relative contribution to the Commonwealth. A council of the university presidents should be expected to formulate continuing guides to the Governor and the General Assembly.

for future sharing of appropriations.

The state teachers colleges should broaden their offering in order to become complete liberal arts colleges. In revising their curricula, they should move away from concentration on courses dealing with pedagogy, such specialized training to be obtained through graduate study at one of the universities. The teachers colleges in their new role should strive to attract students from their own communities in order to lessen the need for new dormitory construction. Much of the required expansion in the undergraduate programs, which private colleges are not willing or able to accommodate, and which cannot feasibly be supplied through junior colleges, can be accomplished at the state colleges. However, the requirement for higher standards of admissions must be carefully observed at these institutions.

REGIONAL
OPERATIVE
ANNING

Although the Advisory Panel strongly favors the encouragement of individual initiative and self-determination among Pennsylvania's several existing institutions of higher education, it also recognizes the wisdom of sharing resources both material and intellectual whenever feasible.

A council of the four state-aided universities has been proposed. Going further, it may be noted that many of the 71 essentially undergraduate colleges (Exhibit 17) are so located as to cluster around the larger universities in the Commonwealth. Experience in some sections of the United States has shown the value of the cooperative pooling or sharing of facilities and intelligence in the solution of vexing problems.

No doubt promising students with the qualifications to become successful college teachers could be discovered and prepared for such professional service by the cooperative effort of colleges and universities of a region. The cooperative program in graduate teacher education now conducted by six institutions in the southeastern part of the Commonwealth is an example. Such a cooperative endeavor might also reveal the possibility of further sharing of facilities and personnel and thereby effect a needed financial saving.

CONCLUSION The Panel wishes to emphasize that implicit in the many recommendations it has made is the conviction that there must be an increase in the quality of the Commonwealth's program of higher education to accompany the increased ability to cope with larger numbers of students. The Panel believes that all of the proposals made in its report, if they are accepted and implemented thoughtfully, should not only meet the crisis of numbers but also bring about improved college and university education throughout the Commonwealth.

APPENDIX A

THE GENERAL ASSEMBLY OF PENNSYLVANIA

HOUSE RESOLUTION

No. 107

Session of
1957

Introduced by Messrs. Johnson, Donaldson, Jr.,
Austin M. Lee Breon, Jr., May 14, 1957

Mr. Lafore, Rules, as Committed, May 14, 1957

In the House of Representatives, May 9, 1957

WHEREAS the problem of equal opportunity of all for higher education in the Commonwealth of Pennsylvania has become a matter of widespread concern particularly the question of state subsidization of qualified secondary school graduates without adequate financial means to continue their schooling at the college level and

WHEREAS A number of plans have been advanced seeking a solution to this problem and containing in many instances meritorious features and

WHEREAS The participation of the State in this field involves broad questions of financial feasibility revenue sources adequate administration and overall effectiveness and has led to widespread controversy and

WHEREAS The General Assembly requires additional specific and detailed information in order to determine intelligently the form and extent of any such program or programs therefore be it

RESOLVED (the Senate concurring) that the Joint State Government Commission conduct a thorough study of the problems of higher education by considering the following factors

1. Advisability of establishing free and loan scholarship funds for worthy students who have displayed capacity for higher learning to be based upon a study of various existing scholarship programs

2. Authorizing use of existing high school facilities as Junior colleges on a community level

3. Extension of college centers similar to those throughout the Commonwealth to be operated by and through existing institutions of higher learning

4. Whether the Commonwealth should expand its present system of State Teachers Colleges with a view to their eventually becoming State Universities

5. Determine the capacities of existing institutions of higher learning in Pennsylvania and the point at which they will have reached their maximum capacity

6. Make a detailed analysis of the cost of such programs for higher education including in addition to outright grants the cost of over-all administration

7. Compile any other data or information that will be needed by the General Assembly to appraise the problem of higher education in the Commonwealth while considering the task of doing a good job with respect to primary and secondary education therefore be it further

RESOLVED That the Joint State Government Commission submit a report to the General Assembly on its findings and recommendations as soon as completed but not later than January 1, 1959.

Passed House of Representatives May 16
Agreed to in Senate June 6

APPENDIX B

ENROLLMENT PREDICTIONS UNDER THE TRIMESTER SYSTEM

The accompanying table suggests how the enrollment throughout the Commonwealth might be distributed if a trimester plan were placed in full operation in the academic year 1959-60. The following assumptions were made in this presentation.

1. All students entering the first year of undergraduate, graduate, or professional work are assumed to enter in the fall term.
2. All students take an eight semester course of study.
3. Attrition occurs at the end of every second term at the following rate:

<u>Enrollment After</u>	<u>Percent of Entering Group</u>
2 terms	75%
4 terms	60%
6 terms	50%
8 terms	50%

4. The number of entering students is the same as might be expected with no change in current academic calendar.

The assumptions obviously oversimplify the actual situation and are made for demonstration purposes only.

The following possibilities would cause the estimates to be higher than shown:

1. Delay in putting the trimester into effect;

2. Failure of students to take full advantage of the offering;
3. Entering enrollment might be higher in early years as additional graduate and professional students enter by reason of stepped-up undergraduate programs. Expansion of enrollment in later years would then be less because these students would have completed advanced work more rapidly.

The following possibilities would cause the estimates to be

lower:

1. Attrition may occur more frequently than at the end of each two term period;
2. Entrance at the start of each term instead of at the start of the fall term would compress the time in school even further and thus reduce enrollments.

POSSIBLE DISTRIBUTION OF ENROLLMENT UNDER TRIMESTER SYSTEM
 (Thousands of Full-Time-Equivalent Students)
 Year of Entrance

Enrollment Each Term	57	58	59	60	61	62	63	64	65	66	67	68	69	70	TOTAL
59-60															
F	29	33	41	67											170
W	<u>29</u>	33	41	67											170
S		27	33	51											111
60-61															
F		<u>27</u>	33	51	75										186
W			27	41	75										143
S			<u>27</u>	41	56										124
61-62															
F				34	56	77									167
W				<u>34</u>	45	77									156
S					45	58									103
62-63															
F					37	58	84								179
W					<u>37</u>	48	84								169
S						48	63								111
63-64															
F						40	63	93							196
W						<u>40</u>	50	93							183
S							50	70							120
64-65															
F							42	70	103						215
W							<u>42</u>	56	103						201
S								56	77						133
65-66															
F								46	77	109					232
W								<u>46</u>	62	109					190
S									62	82					144
66-67															
F									51	82	115				248
W									<u>51</u>	66	115				232
S										66	86				152
67-68															
F										55	86	123			264
W										<u>55</u>	68	123			246
S											68	91			159
68-69															
F											58	91	124		273
W											<u>58</u>	74	124		256
S												74	93		167
69-70															
F												61	93	125	279
W												<u>61</u>	74	125	260
S													74	95	169

APPENDIX C

**Tables of Data Supporting Graphs
in Body of Report**

TABLE 1
ESTIMATES OF FUTURE PENNSYLVANIA POPULATION
AGE 18-21 YEARS

	U.S. BUREAU CENSUS *	MORNEWECK	THOMPSON
1958	573,696	566,125	544,664
1960		607,102	582,732
1962		655,087	623,061
1963	659,499		
1964		675,120	643,506
1966		766,972	722,819
1968	818,232	816,373	768,701
1970			766,607

* Adjusted from 18-24 Age Group by A. Ciocco and M. Patno

Sources: U. S. Bureau of the Census, Illustrative Projections of the College-Age Population by State: 1958 to 1973, Series P-25, No. 132, 1956.

The Enrollment Picture for the Decade Ahead, Research Studies and Reports Series No. 3, Dr. Carl B. Morneweck, Director of Research, Dept. of Public Instruction, Commonwealth of Pennsylvania, March, 1958.

R. B. Thompson, The Problem of Rising College Enrollments, The College Blue Book, New York, 1957.

TABLE 2

PER CENT OF PUBLIC ELEMENTARY SCHOOL ENROLLEES
GRADUATING FROM HIGH SCHOOL AND ESTIMATED TREND,
PENNSYLVANIA 1937-1970

1937	34.2
1942	45.2
1947	47.7
1952	54.9
1957	60.6
1970	77.5

PER CENT OF PUBLIC HIGH SCHOOL GRADUATES ENTERING
COLLEGE AND ESTIMATED TREND, PENNSYLVANIA 1937-1970

1937	15.2
1942	12.6
1947	17.9
1952	20.5
1957	25.3
1970	32.0

Source: The Enrollment Picture for the Decade Ahead, Research Studies and Reports Series No. 3, Dr. Carl B. Morneweck, Director of Research, Department of Public Instruction, Commonwealth of Pennsylvania, March, 1958.

TABLE 3
GRADUATE ENROLLMENT AS A PER CENT OF TOTAL
ENROLLMENT IN INSTITUTIONS OF HIGHER EDUCATION AND
ESTIMATED TREND, PENNSYLVANIA 1900-1970

1900	1
1910	2
1920	3
1930	6
1940	10
1950	11
1970	17

Source: Actual Data - Council of State Governments, Higher Education in the Forty-Eight States, A Report of the Governors' Conference, 1952

TABLE 4
ESTIMATES OF TOTAL ENROLLMENT
IN INSTITUTIONS OF HIGHER EDUCATION,
PENNSYLVANIA 1952-1970

DATE	Thompson Estimate		Morneweck and Advisory Panel Minimum Estimate		Advisory Panel Maximum Estimate	
	Total Number	Index 1958	Total Number	Index 1958	Total Number	Index 1958
1952 (51-52)	124,081	77	133,708	77		
1954 (53-54)	131,943	82	137,707	80		
1956 (55-56)	153,638	96	159,806	92		
1958 (57-58)	160,277	100	172,589	100	172,589	100
1960 (59-60)	170,726	106	187,758	109	195,000	113
1962 (61-62)	194,722	121	222,605	129	236,000	137
1964 (63-64)	203,674	127	240,871	139	279,000	162
1966 (65-66)	229,656	143	281,202	163	336,000	195
1968 (67-68)	265,170	165	334,919	194	390,000	226
1970 (69-70)	270,699	169	369,000*	214	443,000	258

Sources: R. B. Thompson, The Problem of Rising College Enrollments, The College Blue Book, New York, 1957; The Enrollment Picture for the Decade Ahead, Research Studies and Reports Series No. 3, Dr. Carl B. Morneweck, Director of Research, Department of Public Instruction, Commonwealth of Pennsylvania, March, 1958.

* Morneweck projection extended from 1968 to 1970 by the Advisory Panel.

TABLE 5

ESTIMATES OF FULL-TIME ENROLLMENT
IN INSTITUTIONS OF HIGHER EDUCATION,
PENNSYLVANIA 1952-1970

	Governor's Commission Maximum Estimate		Morneweck Estimate	
	Total Number	Index 1958	Total Number	Index 1958
1952 (51-52)	99,859	73	96,349	79
1954 (53-54)	101,813	75	96,903	80
1956 (55-56)	122,508	90	111,261	92
1958 (57-58)	136,338	100	120,996	100
1960 (59-60)	153,438	112	132,336	109
1962 (61-62)	183,791	135	156,897	130
1964 (63-64)	200,061	147	169,771	140
1966 (65-66)	243,084	178	198,197	164
1968 (67-68)	286,076	210	236,058	195
1970 (69-70)	307,552	225	247,000*	204

Sources: Higher Education in the Commonwealth, Report of the Governor's Commission on Higher Education, Harrisburg, 1957; The Enrollment Picture for the Decade Ahead, Research Studies and Reports Series No. 3, Dr. Carl B. Morneweck, Director of Research, Department of Public Instruction, Commonwealth of Pennsylvania, March, 1958.

* Morneweck projection extended from 1968 to 1970 by the Advisory Panel.

TABLE 6
FREQUENCY WITH WHICH SPECIFIC FRINGE BENEFITS ARE PROVIDED TO FACULTY AND STAFF GROUPS^{1/}
IN PUBLIC INSTITUTIONS ACCORDING TO METHOD OF FINANCING, BY CONTROL, 1957-58

Method of financing and specific fringe benefit	Total response	None reported	Fac-ulty	Mainte-nance staff	Fac. & Adm.	Off. & Main.	Fac., Adm., & Off.	Adm., Off., & Main.	Fac., Adm., Off., & Main.	All other combinations
1	2	3	4	5	6	7	8	9	10	11
Provided by institution at no cost to employees										
1. Retirement annuity other than OASI	448	432	1	-	6	-	-	-	9	-
2. Group hospitalization	448	442	-	-	1	3	-	-	2	-
3. Major medical coverage	448	441	1	-	1	3	-	-	2	-
4. Accident insurance	448	377	-	-	-	-	-	-	69	2
5. Health service provided by institution	448	416	-	-	-	-	-	-	32	-
6. Life insurance	448	436	-	-	3	1	-	-	8	-
7. Sabbatical leaves	448	343	62	-	37	-	1	-	5	-
8. Vacations with pay	448	56	1	1	2	11	2	100	269	6
9. Sick leaves with pay	448	40	2	-	7	2	4	10	380	3
10. Reduction of tuition to employee's dependents	448	413	6	-	5	1	3	-	20	-
11. Discount on purchases	448	422	-	-	1	1	1	-	23	-
12. Loan fund for sizable purchases	448	438	-	-	2	-	-	-	8	-
13. Significant recreation facilities	448	384	-	-	-	-	6	-	58	-
Cost shared by institution and employees										
1. Social Security (OASI)	448	134	1	22	5	10	-	1	272	3
2. Retirement annuity other than OASI	448	99	7	-	33	5	20	2	277	5
3. Group hospitalization	448	373	1	-	2	-	3	-	68	1
4. Major medical coverage	448	410	-	-	3	-	2	-	32	1
5. Accident insurance	448	412	1	1	2	-	-	-	32	-
6. Health service provided by institution	448	427	-	1	1	-	1	-	18	-
7. Life insurance	448	364	2	-	4	1	2	-	74	1
8. Sabbatical leaves	448	335	52	-	52	-	1	-	8	-
9. Sick leaves with pay	448	431	-	-	-	-	2	-	14	1
10. Reduction of tuition to employee's dependents	448	433	2	-	1	-	-	-	12	-
11. Discount on purchases	448	445	-	1	-	-	-	1	1	-
12. Providing housing for many employees	448	417	3	2	2	-	1	-	18	5
13. Significant recreation facilities	448	428	-	-	-	-	2	-	18	-
Service available but not subsidized by institution										
1. Retirement annuity other than OASI	448	398	1	-	6	1	4	-	37	1
2. Group hospitalization	448	116	1	2	6	1	7	-	312	3
3. Major medical coverage	448	260	-	-	6	2	6	-	173	1
4. Accident insurance	448	330	-	-	3	1	6	1	105	2
5. Providing housing for many employees	448	398	5	-	5	1	1	-	38	-

^{1/} Abbreviations used in column headings are: Fac. - Faculty; Adm. - Administration; Off. - Office staff; Main. - Maintenance staff.

Source: U.S. Office of Education, Higher Education Management and Planning Data, 1957-58, Washington, D. C., 1958, p. 58.

TABLE 7

FREQUENCY WITH WHICH SPECIFIC FRINGE BENEFITS ARE PROVIDED TO FACULTY AND STAFF GROUPS^{1/}
IN PRIVATE INSTITUTIONS ACCORDING TO METHOD OF FINANCING, BY CONTROL, 1957-58.

Method of financing and specific fringe benefit	Total response	None reported	Fac- ulty	Mainte- nance staff	Fac. & Adm.	Off. & Main.	Fac., Adm., & Off.	Adm., Off., & Main.	Fac., Adm., Off., & Main.	All other combinations
1	2	3	4	5	6	7	8	9	10	11
Provided by institution at no cost to employees										
1. Retirement annuity other than OASI	704	620	10	4	27	13	3	1	24	2
2. Group hospitalization	704	642	2	6	6	2	2	-	40	4
3. Major medical coverage	704	663	-	1	11	1	3	-	24	1
4. Accident insurance	704	561	2	11	3	2	1	-	113	11
5. Health service provided by institution	704	613	1	1	1	1	2	-	82	3
6. Life insurance	704	614	1	3	15	6	6	1	54	4
7. Sabbatical leaves	704	533	118	-	32	-	1	-	19	1
8. Vacations with pay	704	72	2	10	1	21	9	115	457	17
9. Sick leaves with pay	704	148	5	2	10	5	29	10	483	12
10. Reduction of tuition to employee's dependents	704	313	32	1	72	-	26	-	252	8
11. Discount on purchases	704	452	1	2	8	1	12	-	225	3
12. Loan fund for sizable purchases	704	593	24	1	41	-	4	-	38	3
13. Significant recreation facilities	704	583	4	1	10	-	14	-	90	2
Cost shared by institution and employees										
1. Social Security (OASI)	704	74	2	5	4	12	8	14	558	27
2. Retirement annuity other than OASI	704	246	34	1	181	4	62	1	165	10
3. Group hospitalization	704	536	2	2	6	4	17	2	128	7
4. Major medical coverage	704	629	-	-	8	-	12	-	54	1
5. Accident insurance	704	640	2	4	2	-	6	-	45	5
6. Health service provided by institution	704	655	1	1	2	-	1	-	43	1
7. Life insurance	704	465	2	2	42	2	19	4	163	5
8. Sabbatical leaves	704	570	100	-	25	-	-	-	9	-
9. Sick leaves with pay	704	668	2	1	-	3	2	-	27	1
10. Reduction of tuition to employee's dependents	704	569	13	1	7	15	4	3	90	2
11. Discount on purchases	704	664	2	-	2	-	1	-	34	1
12. Providing housing for many employees	704	554	16	8	30	2	16	1	49	28
13. Significant recreation facilities	704	677	-	-	2	-	4	-	21	-
Service available but not subsidized by institution										
1. Retirement annuity other than OASI	704	693	-	-	-	3	1	-	6	1
2. Group hospitalization	704	288	5	-	7	5	26	3	356	14
3. Major medical coverage	704	591	2	-	-	3	2	-	102	4
4. Accident insurance	704	643	1	2	4	1	12	-	41	-
5. Providing housing for many employees	704	621	7	2	13	1	7	-	44	9

^{1/} Abbreviations used in column headings are: Fac. - Faculty; Adm. - Administration; Off. - Office staff; Main. - Maintenance staff.

Source: U. S. Office of Education, Higher Education Management and Planning Data, 1957-58, Washington, D. C., 1958, p. 59.

TABLE 8
 PROJECTION OF OPERATING EXPENDITURES
 UNDER CONDITIONS OF MINIMUM ENROLLMENTS
 IN INSTITUTIONS OF HIGHER EDUCATION,
 PENNSYLVANIA 1956-1970

(millions of dollars)

	<u>1956</u>	<u>1958</u>	<u>1964</u>	<u>1970</u>
General Administration	\$18.5	\$20.3	\$36.5	\$53.0
Student Services	4.4	4.8	6.9	10.0
Instruction	60.9	57.0	160.1	232.1
Extension	4.5	4.6	6.6	9.6
Library	4.1	4.3	4.8	5.2
Maintenance	19.5	20.4	31.3	33.5
Research	20.5	21.9	31.5	42.8
Organized Activities	14.1	14.8	21.3	29.5
Housing and Feeding	21.1	21.7	31.2	45.3
Other	12.1	12.4	16.0	20.0
Equipment	3.5	3.6	5.2	7.5
Scholarship	<u>7.9</u>	<u>8.3</u>	<u>8.3</u>	<u>8.3</u>
Total Expenditures	<u>\$191.1</u>	<u>\$204.1</u>	<u>\$359.7</u>	<u>\$496.8</u>

Source: 1956, Actual unpublished data, U. S. Office of Education,
Biennial Survey of Education

TABLE 9
 PROJECTION OF OPERATING EXPENDITURES
 UNDER CONDITIONS OF MAXIMUM ENROLLMENTS
 IN INSTITUTIONS OF HIGHER EDUCATION,
 PENNSYLVANIA 1956-1970

(millions of dollars)

	<u>1956</u>	<u>1958</u>	<u>1964</u>	<u>1970</u>
General Administration	\$18.5	\$20.3	\$43.0	\$62.5
Student Services	4.4	4.8	8.6	12.5
Instruction	60.9	67.0	180.0	260.0
Extension	4.5	4.6	7.9	11.3
Library	4.1	4.3	5.0	7.0
Maintenance	19.5	20.4	31.3	38.1
Research	20.5	21.9	37.7	45.0
Organized Activities	14.1	14.8	25.5	28.2
Housing and Feeding	21.1	21.7	37.3	54.3
Other	12.1	12.4	18.0	24.0
Equipment	3.5	3.6	6.2	8.0
Scholarships	<u>7.9</u>	<u>8.3</u>	<u>8.3</u>	<u>8.3</u>
Total Expenditures	<u>\$191.1</u>	<u>\$204.1</u>	<u>\$408.8</u>	<u>\$559.2</u>

Source: 1956, Actual unpublished data, U. S. Office of Education,
Biennial Survey of Education.

TABLE 10

TABLE OF INCOME BY SOURCES AND TOTAL EXPENDITURES
 UNDER CONDITIONS OF MINIMUM ENROLLMENT
 IN INSTITUTIONS OF HIGHER EDUCATION,
 PENNSYLVANIA, 1958, 1964, AND 1970

(Millions of Dollars)

	<u>1958</u>	<u>1964</u>	<u>1970</u>
Income from Students	\$ 70.0	\$101.0	\$146.0
Endowment Income and Gifts	24.6	36.9	49.2
State Aid	40.0	40.0	40.0
Federal Aid	16.0	25.6	36.9
Other sources of Income	53.5	63.3	91.8
Total Income	<u>204.1</u>	<u>266.8</u>	<u>363.9</u>
Total Expenditures	<u>204.1</u>	<u>359.7</u>	<u>496.8</u>
Excess of Expenditure over Income	-----	\$ 92.9	\$132.9

TABLE 11

TABLE OF INCOME BY SOURCES AND TOTAL EXPENDITURES
 UNDER CONDITIONS OF MAXIMUM ENROLLMENT
 IN INSTITUTIONS OF HIGHER EDUCATION,
 PENNSYLVANIA, 1958, 1964, AND 1970

(Millions of Dollars)

	<u>1958</u>	<u>1964</u>	<u>1970</u>
Income from Students	\$ 70.0	\$101.0	\$146.0
Endowment Income and Gifts	24.6	37.3	50.5
State Aid	40.0	40.0	40.0
Federal Aid	16.0	25.6	36.9
Other sources of Income	53.5	66.3	96.3
<hr/>			
Total Income	204.1	270.2	369.7
Expenditures	204.1	408.8	559.2
Additional Expenditures for student aid for subsistence	-----	19.5	29.0
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Total Expenditures	204.1	428.3	588.2
Excess of Expenditures over Income	-----	\$158.1	\$228.0

