VOCATIONAL EDUCATION

OF

COLLEGE GRADE

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on

VOCATIONAL EDUCATION OF COLLEGE GRADE

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FOREWORD

IN ONE sense all education is vocational in purpose: There is almost no vocation which cannot be performed better by a well-educated person than by an uneducated person. We have been slow to set up special schools designed to train for specific vocations partially because there has been a feeling that education in a democracy should assure a close relation between vocational education and education for civic and social life.

During the early part of the present century it became clear that in our efforts to emphasize general education we were neglecting vocational education. The agitation to correct that defect resulted in the passage of the Smith-Hughes law in 1917. Since that date a very effective system of vocational education "of less than college grade" has developed in this country under the stimulus of Federal funds specifically appropriated for the purpose.

During the past two decades, institutions above the high-school grade have been feeling the pressure to broaden their services to include vocational education for a wide variety of callings not adequately prepared for in the high school. The movement has developed well in some places, but in the country as a whole it has not met the needs of individual students, and of the economic order. Many educational trends as well as economic trends have been converging in such a way as to emphasize the very great importance of better systematizing the program of vocational education in post-high-school institutions.

Accordingly, the staff of the Division of Higher Edutation in the U. S. Office of Education assumed responsibility in the late spring of 1945 to prepare a report dealing with the question of vocational education of college grade. The first draft of their report was submitted for criticism to an advisory committee. Following the criticisms of this committee, which met on June 29 and 30, 1945, and taking into account also criticisms which were made by others to whom the manuscript was submitted, a new draft of the report was prepared and submitted again to the members of the advisory committee for their criticisms.

The staff and the advisory committee agree that there are two vocational education programs of college grade which should be omitted from this report. They are the programs in teacher education and in nursing education. These programs are in many cases of less than baccalaureate degree length and they are thoroughly systematized into curricula. They therefore conform to the definition of vocational education of college grade. They are omitted, however, because both teacher education and nursing education range by almost imperceptible steps from curricula of a year or two in length to curricula of 5 or 6 years in length. Both teachers and nurses are striving for recognition on the professional level and are eliminating less than degree curricula as rapidly as possible. Therefore, it was felt that confusion would arise if these two training programs were described under the caption vocational education of college grade.

Many individuals in addition to the members of the advisory committee have been helpful in preparing the report. Particular mention should be made of representatives of junior colleges in California, Utah, and Arizona, who came together at the invitation of the Office of Education to consider the entire project. The deliberations of the conference held at Los Angeles have been helpful to the staff in preparing the report.

Special thanks are due the members of the advisory committee, and the representatives of the institutions whose programs are described in this report.

FRED J. KELLY, *Director*,
Division of Higher Education.

Part I

AN EVOLVING PROGRAM OF VOCATIONAL EDUCATION

Chapter I. BACKGROUND AND DEFINITIONS

THIS REPORT deals with a rapidly developing area of vocational education, called, for want of a better designation, vocational education of college grade. The area lies between the program of vocational education of less-than-college grade (that commonly done in technical high schools and trade schools) on the one hand, and professional education on the other.

WHY THE REPORT HAS BEEN PREPARED

The purpose of the report is threefold:

First, to canvass the extent and urgency of need for such programs of vocational education of college grade.

Second, to indicate the nature and extent of present programs of vocational education found in institutions of college grade.

Third, to point out some of the questions which appear to be involved in the adequate development of such programs.

Interest in college vocational education is heightened at the present time by at least three considerations:

First, the rapid expansion of education is bringing to the colleges not only more students, but more nearly than before a cross section of the youth population of the country. This demands a basic readjustment of college offerings so as to serve a constantly increasing number of the young people.

Second, veterans returning from the armed forces and war workers returning to peacetime jobs want, under college auspices, a wide variety of curricula including those with vocational applications.

Third, Federal legislation on the statute books and bills pending before Congress call for a clarification of the boundary line between vocational education of "less-than-college grade" and vocational education of college grade.

DEFINITIONS

Certain difficulties and limitations due to lack of well-defined terms were encountered in preparing this report. Some of these the readers will need to have in mind. Three of them will be mentioned:

First, successive levels of training. Unfortunately, usage has not yet established common meanings for many of the terms necessarily used in the report. "Vocation" and "vocational education" are all-

inclusive terms. Medicine is a vocation as is bricklaying. But medicine is also a profession whereas by common usage bricklaying is not. There is, however, no clear line of demarcation between professions and other vocations. Similarly, vocational education while etymologically applicable to all levels has come by common usage to have a limited meaning, particularly since the Smith-Hughes Act of 1917 established a federally subsidized program of vocational education "of less-than-college grade." It has been necessary, therefore, to use three phrases in this report to designate types of programs, and to give them the following meanings:

(*a*) "Vocational education of less-than-college grade," meaning that area of training which does not require the maturity and breadth of understanding and knowledge customarily identified with higher education.

(*b*) "Vocational education of college grade," meaning that area of training exclusive of professional education characterized by the intellectual requirements, breadth of understanding and knowledge customarily found in college curricula and carried on in an institution which requires for admission of its regular students high-school graduation or its equivalent.

(*c*) "Professional education," meaning that area of education involving a curriculum in college or university leading to a baccalaureate or professional degree which prepares for the practice of a profession.

It is freely granted that the above definitions do not draw clear lines of demarcation between these training programs. Probably it is not advantageous to attempt to draw hard and fast lines between them. But for many curricula there will be no question of their classification. For example, training for a carpenter may well be of less-than-college grade; training for a medical laboratory technician must be of college grade; training for an electrical engineer must be of professional grade. But there are borderline cases between these where it is by no means clear where the training program should be given. In fact, it is likely that in many cases the training could be given under either one of the two first defined programs, depending upon the type of outcome desired. A single case will illustrate. An auto mechanic may well be prepared in a program of less-than-college grade for many, if not most, of the tasks he will perform. But the sciences basic to a thorough understanding of his tasks—and incidentally leading to a much keener satisfaction in the doing of them—may well involve mathematics, physics, and chemistry of a type everywhere recognized to be of college grade. It is understandable, therefore, that some colleges, particularly junior colleges and technical institutes, find it desirable to introduce college-grade

auto-mechanics curricula. It is assumed that colleges introducing such work will expect the standard applied to the work of this curriculum to be comparable to that applied to other college curricula. They will not duplicate the program of auto-mechanics training done in high schools. Or if they do pattern their training upon the work of the high school, it is hoped that they will create a vocational school unit in which to do it, and thus avoid confusing that program with vocational education of college grade.

It must be remembered that "college grade" does not have much to do with the question of the subject taught. Beginning French, for example, may be either of college grade or of less-than-college grade. If college teachers use no richer content, have no superior experience, make no more rigorous intellectual demands in their college teaching of beginning French than prevail in the high school, then beginning French, under such teacher even though done in college is not of college grade, as "college grade" is used in this report. But if college teachers of auto mechanics in comparison with high-school teachers do have a broader scientific background, a more varied experience, and do utilize distinctly collegiate standards in their methods of teaching and in their course and curriculum requirements, then auto mechanics may well be of college grade. When thus conceived, college grade work may be done by students of adequate competence regardless of whether they have completed the work of the high school. Much adult education is of college grade even though the requirement of high-school graduation is waived in the case of persons of maturity and of demonstrated competence.

Incidentally, it is necessary to make clear that if any State or community wishes to intrust to a college or university the responsibility for maintaining curricula "of less-than-college grade," it is not the intent of this discussion to disparage such practice. The point should be made, however, that if the natural development of vocational education in the colleges is not to lower the standards of work done in the colleges, these distinctly trade or other vocational education curricula in colleges which do little or no more than duplicate curricula carried on customarily in the high schools should be set apart in a separate administrative unit and not confused with work of college grade. The agricultural schools of less than college grade of the University of Minnesota, and the trade training division of the North Dakota School of Science are illustrations of such organization.

Second, name to apply to the occupations concerned. The second difficulty in definition encountered in preparing the report had to do with a name to apply to the many occupations or vocations preparation for which is believed to call for vocational education of college grade. Such words as "semiprofessional" and "technical" have come

to be used, but they are obviously applicable to only a part of the occupations included, and are used with no clearly defined meaning. In order to simplify the language of the report it was decided to use the phrase "intermediate vocations," defining it arbitrarily as the whole list of vocations for which the term "vocational education of college grade" is applicable.

Third, meaning of the word "college." In American education, the term "college" has two quite different meanings. First, a college is an institution. As such the connotation of arts and sciences clings tenaciously to it. This is in spite of the fact that there are colleges of engineering, of dentistry, of business, and a score of others. The incautious reader nevertheless thinks of vocational education of college grade as partaking of the nature of the college of arts and sciences. That is of course a too limited concept of college, even as an institution.

But the second meaning of the term "college" is a level in the scheme of educational organization. We customarily designate three levels of education—elementary school, high school, and college. In this sense, the term "college" embraces all higher education. It merely designates that part of the educational system which requires the completion of the high school for admission.

It must be understood that the term "college" is used in the latter sense in this report. College is a level in the vertically organized educational system of this country. As a system evolves, as the high schools change, as the types of students entering the college level change, the character of the college changes. It must serve the educational needs of all who wish, and qualify for, education beyond the high-school level. It must have curricula of various lengths and leading to all sorts of occupational ends. It includes technical institutes, business colleges, junior colleges, normal schools, thirteenth and fourteenth grade schools, extension centers, and the like, as well as the better understood 4-year colleges, teachers colleges, and universities. It is to this level of education that the report refers when it uses the expression "of college grade." It will be understood, therefore, that work done in a college (an institution requiring high-school graduation or its equivalent for admission) is of college grade except where the college itself organizes units, courses, or curricula on the less than college level to serve the interests of its community or State. The college should then clearly announce them as such to the public.

BACKGROUND

If the above paragraphs have made clear what the report is about, and have indicated the meaning it gives to certain words and phrases used, it is appropriate now to fill in some of the background facts

which help to put vocational education of college grade in its true perspective.

The people of this country have an abiding faith in education. Furthermore, they believe that an adequate education is the birthright of every American child and youth. They are coming to know too that this education must be adapted to the needs and capacities of all types of youth. Generations of children and youth when so educated are believed by the American public to be the country's greatest asset—economic, political, and cultural.

In furtherance of this faith and belief, the people have taken important steps. They have established the public schools. Vast public lands have been set aside in most States to aid these schools. People tax themselves freely to support them. Universities and colleges are also maintained by most States. Both public lands and taxation are used in their support. Each decade finds them expanding their offerings in an effort to meet the needs of a larger and larger part of the people, both youth and adults.

In spite of this rosy picture, educational leaders have not been able to prevent the schools and colleges from falling behind at times in the procession of American progress. Back through the years educational development has reached plateaus where progress was slow. Campaigns were necessary to bring about the concerted efforts required to break the grip of retarding forces. Each time when the break was accomplished great forward movements in education followed as if to reward the labors of those leaders with the needed vision and zeal to carry on the campaigns. Two sets of circumstances in the past teach such clear lessons in relation to a kindred set of circumstances existing today that they will be briefly detailed.

The first has to do with widening the base of the colleges. Nearly a century ago colleges and universities in this country were dominated largely by the classical tradition of their British and continental prototypes. They were not providing an education suited adequately to the needs of a pioneer people. Agriculture and mechanic arts were the foundation upon which national development must rest, but their study was not "respectable" in academic circles. Universities catered largely to the professional and privileged groups.

While agitation in a few States had resulted in starting instruction in these fields, not until the Morrill Act passed in 1862 after years of debate did agriculture and mechanic arts spread widely throughout the universities of the country. The grip of the genteel and classical tradition was broken. Higher education, previously adapted to the needs of the few, was released to begin the adaptations which have continued to widen its service ever since. In 1940 almost a million and a half of the young people were enrolled in the regular full-time pro-

grams of 1,700 colleges and universities. This is an increase of more than tenfold in 50 years.

The second set of circumstances has to do with widening the base of the high school. In spite of the stamp of respectability given to agriculture and mechanic arts in the colleges during the late decades of the last century, the high schools, while multiplying rapidly during the same period, continued to be too narrow in their concept of what their services should include. They prepared for admission to college, but beyond that they did too little.

Campaigns were carried on by agricultural, labor, and industrial groups, urging that the high schools should serve also the needs of young people who did not intend to go on to college. There was considerable response to these demands. Manual training, commercial subjects, and some other vocational courses were introduced. Elective subjects were offered. Here and there a vocational high school was established. But in spite of this response, the base of the high school widened slowly. Even during the early years of the present century, the spirit and purpose of the high school in this country remained essentially as dictated by its college preparatory function.

In 1917 the Smith-Hughes vocational education act was passed. This took the brakes off, and the high schools began a rapid development not only of vocational education in agriculture, trades and industries, home economics, and commerce, but also of other courses called for to serve the needs of the communities. Now the high schools enroll nearly three-fourths of the entire age group 14 to 17 years. This is five times the proportion of this age group enrolled in 1910. They graduate each year more than half as many as all the 17-year-olds. Moreover, extensive services have been provided for employed adults through part-time, evening, and similar programs.

These two movements, the one to broaden the base of the college, the other to broaden the base of the high school, merely highlight the determination of the people of this country to develop an educational program adapted to the needs of all American youth. But the problems are by no means all solved. Education is not yet adapted to the needs of all youth. High schools, colleges, and universities have yet to make many adjustments in their programs before young people of all types of interest and ability can find in them adequate preparation for life and for making a living. It is with one of these areas of needed adjustment that this report deals.

Colleges and universities have become widely vocationalized on the professional school level, but they have not made adequate adjustments to serve those young people and adults who graduate from high school and want vocational education for the scores of occupations of less-than-professional grade. More terminal curricula of less

than the bachelor's degree level are needed. It will be one of the purposes of this report to explore the nature and scope of this need.[1]

The principal distinguishing mark of the vocations, preparation for which is found generally in colleges rather than in high schools, is the amount of basic information and skill beyond the customary scope of the high school which is required to carry on the vocations satisfactorily.

To name a few of these intermediate vocations will help to make the distinction clear, although elements of some of these may be taught, of course, on more than one level. In the aircraft industry are the radio electrician and airport control operator; in the automobile industry, the paint and varnish technician and the time study man; in the building industry, the estimator and the architectural draftsman; in business, the precision instrument salesman and the personnel interviewer; in public service, the police officer and the recreational leader; in medical and dental services, the medical or dental laboratory technician and the medical or dental secretary; in agriculture, the farm machinery service man and the dairy inspector; in home economics (in addition to the universal home management occupation), the restaurant operator and the ladies' wear store buyer. This list contains only a few of many, but is presented to indicate the wide variety of occupations where such maturity, broad information, and skill are obviously required that training of college grade seems clearly indicated. In the case of some of the occupations the broad training required is essentially scientific—the radio technician; in the case of others it is essentially social and economic—the personnel interviewer; in others it is essentially in the field of art; in many the needed training combines science, social studies, and art. In all cases, the degree of responsibility carried, and the broad information required appear to place such occupations as the ones named above in a class distinguishable from those prepared for through programs of less than college grade on the one hand and from the professions on the other. Hence the category, intermediate vocations.

Training for these intermediate vocations has not fared too well in this country. Engineering school graduates still perform the types of service represented by those intermediate vocations in industry

[1] This problem has been studied by many individuals and groups. Four reports particularly valuable in helpful data are:

1. The five volumes prepared and published between 1941 and 1945 by the Commission on Junior College Terminal Education, The American Association of Junior Colleges, Washington, D. C.
2. Vocational Education—Part I of the Forty-second Yearbook of the National Society for the Study of Education, 1943. Distributed by the Department of Education of the University of Chicago.
3. Education for All American Youth, by the Educational Policies Commission, 1201 16th Street, NW., Washington, D. C., 1944.
4. Vocational-Technical Training for Industrial Occupations, by the Consulting Committee on Vocational-Technical Training, U. S. Office of Education, Washington, D. C., 1944.

which might be performed by persons specifically trained for these services in curricula of less than professional grade. Dentists and physicians do what could be done by laboratory technicians. One of the most effective ways to relieve the pressure on the time of highly trained professional personnel such as physicians, dentists, engineers, and business managers would be to provide a more adequate supply of persons with specific training to relieve them of the less professional parts of their present tasks. This would also reduce the cost to society of our expensive professional education.

This introductory statement has sought to make clear what the report deals with, to define some of the terms used, and to sketch the background against which vocational education of college grade must be viewed. The subsequent chapters of the report indicate the extent and urgency of the need for this type of education, the nature of the college offerings already available, details of a few individual institutional programs, and some of the problems confronting educators who will be responsible for the further development of this type of vocational education.

Chapter II. NEED FOR VOCATIONAL EDUCATION OF COLLEGE GRADE

THE NEED for vocational education of college grade is indicated by numerous trends in our national life. Some of these trends are conditioned by the changing structure of our economic life, others grow out of the larger social pattern, while still others are shaped by our scheme of education. It is difficult to determine which of the factors involved in these trends is cause and which is effect. We do not know, for example, whether the attainment of a higher level of education by our people has created a demand for goods, products, and services which has stimulated the development and almost unparalleled expansion of our economic establishment or whether our high standard of economic use has brought forth the desire of our people to secure more education and training. It is likely that there exists an interplay of forces by which each development stimulates the other, to the end that we constantly seek a longer life, with a higher standard of living and a more constructive use of leisure time. It is certain that these accomplishments will be greatly furthered by the provision of educational programs wich produce a better trained and educated population.

An analysis of the distribution of the population of the United States according to the primary activity in which individuals were engaged shows in a gross manner the effect of economic and educational forces which have been at work. Table I shows in percentages the primary divisions of the population for the period 1870–1930. Data for 1940 presented in table II are roughly comparable, since the census of 1940 was taken on a slightly different basis from previous ones. Certain of the data in table I are approximations, and there is some overlap in the figures. The material is presented, however, as descriptive of the situation in general.

Table I.—Percentages showing the primary divisions of the population, for the United States, 1870–1930.[1]

Division	1870	1880	1890	1900	1910	1920	1930
1	2	3	4	5	6	7	8
Working	53.7	53.6	53.9	59.0	61.5	61.1	61.1
Persons in school	16.6	19.8	18.6	17.7	19.6	20.6	22.7
Children 5–15 yrs. not employed and not in school.	10.7	6.8	6.3	6.7	3.6	2.7	2.0
Children under 5 years of age	14.3	13.8	12.4	12.1	11.5	10.9	9.3
Others	4.7	3.0	3.3	2.6	3.3	3.7	4.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

[1] Adapted from Ralph G. Hurlin and Meredith B. Givens, Recent Social Trends in the United States, McGraw-Hill Co., New York, 1933, p. 274.

Table II.—Percentages showing employment status of the population 14 to 25 years old, March 24–30, 1940, for the United States.[1]

Age	Population 14 to 24 years	Persons 14 to 24 years in labor force			Persons 14 to 24 years not in labor force			
		Total in labor force	Employed	Seeking work	Total not in labor force	In own housework	In school	Other and unknown
1	2	3	4	5	6	7	8	9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
14–19 years	56.1	34.0	31.1	68.2	73.6	31.4	93.2	68.4
20–24 years	43.9	66.0	68.9	31.8	26.4	68.6	6.8	31.6

[1] Adapted from Statistical Abstract of the United States, Washington, D. C., U. S. Government Printing Office, 1941, p. 59, table 56.

Several significant developments may be observed from these figures. The proportion of the population designated as "gainful workers," while steadily increasing during the period 1870–1910, has remained fairly constant since that date. Actually a slight decrease is shown. The number of children under 5 years of age has decreased sharply, as has the number of unemployed children 5 to 15 years of age. In the latter instance, while other factors are involved, a good portion of this change must be ascribed to social pressures which have forced children 5 to 15 years of age out of employment and into school. The number of persons in school has made a marked over-all increase, while the categories of housewives and of others have remained fairly constant throughout. In summary, it is significant to observe that the vastly increased production of goods and the great multiplication of services which our society has demanded have been accomplished since 1900 without adding any greater fraction of our population to the labor force. Technological improvements and a better trained labor force have contributed to these accomplishments. Educational trends indicate that the proportion of the population enrolled in school will continue to expand as educational standards are raised and educational qualifications for occupations advanced.

OCCUPATIONAL TRENDS INDICATING NEED FOR HIGHER LEVEL EDUCATION FOR VOCATIONS

> Our vision should not be too much limited, either as to time or scope, in developing education for occupational efficiency. For more than a century economic production has increasingly involved intelligence, science, power, and technology, while ignorance and mere muscular force have been on the decline. This is true whether agriculture, manufacture, or the professions are considered. This long-term trend is synonymous with the tremendous social phenomenon commonly designated as the industrial revolution.[1]

[1] Education and Economic Well-Being in American Democracy. Washington, D. C., Educational Policies Commission, 1940. p. 76.

This trend over a much longer period of time is eloquently described by Sidney and Beatrice Webb in the following terms:

> From the building of the Pyramids down to the present day, the proportion of the world's work of the nature of mere physical digging, pushing, carrying, lifting, and hammering, by the exertion of muscular force, has almost continuously diminished. From the cutting of the canal at Corinth to the cutting of that at Panama, the share of the thinker, the architect, the designer, the draftsman, the engineer, the toolmaker, the accountant, and the clerk, in every productive enterprise has become steadily larger; and the proportion of workers so engaged has grown accordingly.[1]

Occupational data available from several sources support the view that our economic establishment is becoming more and more complex, thus putting a premium on a higher level of knowledge and skills.

Table III indicates in percentages the distribution of gainful workers by census occupational categories, for the decades 1870–1940. The figures for 1940 have been reconciled with previous data by the authors of the material from which table III has been derived. It should be noted that table III does not include consideration of the actual numerical growth of the respective occupational categories nor of the relationship of that growth to the rate of growth of the population of the United States as a whole. Another factor which is not taken into account is the relative rate of unemployment in the different categories.

While a number of significant deductions may be derived from table III, it is sufficient to note that the three occupational categories which may in general be said to contain the largest number of workers with the lowest level of training, viz, agriculture, manufacturing and mechanical industries, and domestic and personal service, either are not tending to occupy a significantly larger fraction of the working force or have actually decreased in the fraction which they occupy. Whereas persons engaged in agriculture comprised 47.3 percent of gainful workers in 1870, only 17.5 percent of the labor force in 1940 was composed of such persons. The proportion of workers engaged in manufacturing and mechanical pursuits has decreased slightly since 1870 although this group increased in proportion until 1890 and has shown a decrease since. Domestic and personal service workers have fluctuated considerably during the period since 1870 although a slight net gain in this group is shown.

Marked increases are found in the proportion of workers in occupational categories which may in general be said to require workers of a relatively higher level of training; viz, transportation and com-

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[1] Beard, Charles A., Editor. Whither Mankind? New York: Longmans, Green & Co., 1928. ch. V, "Labor," by Sidney and Beatrice Webb. p. 140.

Table III.—Percentage distribution of gainful workers by occupational categories, 1870–1940 [1]

Group	1870	1890	1910	1930	1940
1	2	3 a	4	5	6
Agriculture	47.3	37.2	32.5	21.4	17.5
Forestry and fishing	.4	.7	.6	.5	.5
Extraction of minerals	1.4	1.7	2.5	2.0	2.2
Manufacturing and mechanical industries	27.7	31.1	27.5	27.9	26.3
Transportation and communication	3.2	4.8	6.6	8.2	9.2
Trade	4.6	6.5	9.7	12.9	13.8
Public service	.6	.8	1.7	2.5	2.9
Professional service	2.7	3.9	4.2	6.0	6.8
Domestic and personal service	9.7	9.7	10.1	10.8	10.3
Clerical occupations	2.5	3.7	4.3	7.8	10.5
Total [2]	100.1	100.1	99.7	100.0	100.0

[1] Adapted from H. Dewey Anderson and Percy E. Davidson, Occupational Trends in the United States, Stanford University, California. Stanford University Press, 1940. p. 16–17, table 4.
[2] Adjustments of census figures and others necessary to reconcile totals to 100 percent.

munication, which has increased in proportion almost threefold; trade, threefold; public service, almost fivefold; professional service, which has more than doubled; and clerical occupations, which has increased more than fourfold.

Anderson and Davidson in noting the marked shift in emphasis in the kind of work done which has occurred from 1870 to 1930 present the following discussion:

> In 1870, three-fourths of all workers were related to the production of physical goods in agriculture, mines, factories, lumber camps, or building industries. Only one-fourth were available for the services demanded by society in the professions, the semiprofessions, and the distributive trading and serving occupations. By 1930, conditions had altered to the extent that approximately half of all workers in the enormously increased national labor force were attached to the production side of our economy. The other half were used in rendering services, distributing goods, or conducting the many business operations which had developed in the effort to capitalize and manage the business structure. In 1850 there were four producers to every distributor; by 1930 one distributor was necessary to dispose of the goods raised by each producer . . .
>
> While the total population of the United States has increased 33 percent from 1910 to 1930, the number of workers engaged in the combined branches of production, processing, and transporting increased only 6 percent, and the physical volume of goods which passed through their hands increased 86 percent. During these twenty years, service occupations in trading, managing, and personal or professional care expanded 50 percent. The forms of work which cater to the personal health, education, recreation, adornment, pleasures, and social needs of the population have become increasingly characteristic of our modern economic employment; while the forms of work concerned with the production of raw materials or with converting these raw materials into tools or consumption goods have become less important.[3]

[3] H. Dewey Anderson and Percy E. Davidson, Occupational Trends in the United States. California, Stanford University Press, 1940. p. 29–30.

It has been shown in table III and the discussion concerning it that in recent decades the trend has been toward increases in those occupational categories which include large numbers of more highly trained workers. There is some evidence which shows that in those categories which normally include large numbers of less highly trained persons the trend is away from an increase in the proportion of such persons. It is not possible here to make a thoroughgoing analysis of the principal categories involved, viz, agriculture, manufacturing and mechanical industries, and domestic and personal service. A few examples, however, may be indicated. In the field of agriculture, farm laborers have declined in numbers from approximately 5,400,000 in 1910 to 3,530,000 in 1940, and in proportion in the same period from 46.7 percent to 40 percent. One group, that of administrative and service workers, may be taken as representative of the category of manufacturing and mechanical industries. The category of laborers in this group shows a marked decline from 91.8 percent of the total in 1870 to 70.7 percent in 1940. Other groups which require a higher level of training show a corresponding increase in proportion.

We do not have available an entirely accurate and satisfactory scale whereby the national working force may be classified according to the level of training required. Table IV, which contains material drawn from the census of 1940, is presented as a rough indication of the educational attainments of the major occupational groups. The data included in table IV fail to show educational levels by age groups,

Table IV.—Years of school completed by experienced workers in the labor force, by major occupation group, for the United States, 1940 [1]

Major occupation group	Median school years completed	Percent completing						
		Grade school	High school			College		
			Total	1–3 years	4 years	Total	1–3 years	4 or more years
1	2	3	4	5	6	7	8	9
Professional and semiprofessional workers	16.6	7.1	84.8	6.3	18.4	68.1	20.9	47.3
Farmers and farm managers	7.6	78.4	13.2	11.4	6.7	3.4	2.6	.8
Proprietors, managers, and officials, except farm	10.9	58.0	40.7	17.1	23.6	20.3	11.2	9.1
Clerical, sales, and kindred workers	12.2	30.3	60.7	19.9	40.9	18.4	12.2	6.2
Craftsmen, foremen and kindred workers	8.5	69.9	25.5	20.3	15.2	4.6	3.4	1.2
Operatives and kindred workers	8.5	69.7	27.5	22.2	15.3	2.8	2.3	.6
Domestic service workers	7.9	68.3	29.0	16.8	12.2	2.1	1.7	.4
Protective service workers	8.8	53.1	41.2	23.4	17.8	5.7	4.4	1.3
Service workers except protective and domestic	8.7	55.1	40.1	21.3	18.8	4.7	3.7	1.0
Farm laborers and foremen	7.4	78.4	20.4	12.1	8.3	1.3	1.0	.2
Laborers except farm and mine	7.7	72.3	26.9	15.7	10.3	1.8	1.4	.4

[1] Adapted from Sixteenth Census of the United States, 1940. Population, Comparative Occupation Statistics for the United States, 1870 to 1940, Alba M. Edwards and Leon E. Truesdell. U. S. Government Printing Office, Washington, 1943, p. 181, table XXV.

and therefore do not indicate the true situation regarding the younger age categories of the population who have only recently entered upon employment.

Table V, based on the census for the decades 1910 through 1940, shows the gainful workers of the Nation divided into categories which have a certain rough, but generally accurate, relationship to the amount of training required.

Table V.—Gainful workers 14 years old and over in 1910, in 1920, and in 1930, and persons 14 years old and over in the labor force (except new workers) in 1940, classified into social-economic groups, for the United States [1]

Group	Number (in thousands) and percentages of total			
	1910	1920	1930	1940
1	2	3	4	5
Professional persons	1,632 4.4	2,049 5.0	2,945 6.1	3,381 6.5
Proprietors, managers and officials	8,579 23.0	9,180 22.3	9,655 19.9	9,223 17.6
Clerks and kindred workers	3,804 10.2	5,652 13.8	7,986 16.3	8,922 17.2
Skilled workers and foremen	4,363 11.7	5,570 13.5	6,262 12.9	6,104 11.7
Semiskilled workers	5,489 14.7	6,631 16.1	7,972 16.4	10,918 21.0
Unskilled workers	13,401 36.0	12,121 29.4	13,791 28.4	13,457 25.9
Total	37,271 100.0	41,206 100.0	48,594 100.0	52,020 100.0

[1] Adapted from Sixteenth Census of the United States, 1940. Population. Comparative occupation statistics for the United States, 1870 to 1940. Alba M. Edwards and Leon E. Truesdell. Washington, U. S. Government Printing Office, 1943 p. 187, table XXVII.

Certain salient characteristics stand out in this table. Professional persons have approximately doubled in numbers and have increased their proportion of the total by one-half in the period 1910–1940. Proprietors, managers, and officials have increased by approximately one-eighth in numbers but have decreased relatively in proportion to the categories. Clerks and kindred workers have increased two and one-half times in numbers and 20 percent in proportion. Skilled workers and foremen have remained fairly stable in proportion. Semiskilled workers have doubled in numbers and by 50 percent in proportion. Unskilled workers have barely held their own in numbers and have declined sharply in percentage from 36.0 percent to 25.9 percent.

A total of 53.2 percent of the individuals comprising the labor force of 1940 are in the areas for which vocational training of college grade may be said to be appropriate and desirable for all or a considerable fraction of workers. In whole or in part the categories of professional persons; proprietors, managers, and officials; clerks and kindred workers, and skilled workers and foremen may be trained in vocational programs of college grade. Under the census classification a

certain proportion of those at the professional level are in reality, from the viewpoint of training, semiprofessional persons and may be trained in the less than degree-level college programs. Appropriate training is available in college-level programs for a growing number of those classified as skilled workers and foremen.

No long-range planning for vocational education can be made without taking into account the effects of occupational shifts during the current war period. What proportion of these shifts represent acceleration of peacetime trends? What proportion are permanent? Will some new industry or new form of employment now appear to provide a lift to our economics such as the automobile industry provided in the years after the war of 1917–18? Table VI compares average employment for 1939 in certain categories with actual figures for August 1944.

Table VI.—Shifts in wartime employment, 1939–44 [1]
[In thousands]

Group	Average for 1939	August 1943	August 1944
1	2	3	4
Total civilian labor force	54,230	55,440	54,010
Unemployed	7,300	1,070	840
Employed	46,930	54,370	53,170
Agriculture	9,500	9,640	8,570
Manufacturing	10,078	17,182	16,118
Mining	845	882	832
Construction	1,788	1,169	684
Transportation and public utilities	2,912	3,604	3,817
Trade	6,618	6,875	6,896
Financing, servicing, and miscellaneous	4,160	4,172	4,558
Federal, State and local government	3,988	5,886	5,866

[1] Current Statistics of Labor Interest for Selected Periods. *Monthly Labor Review* 59:5, October 1944.

Although planning for the future must take into account the probable effects of the war upon occupational trends, the developments of the past 75 years as shown by the data presented above are quite clear-cut in their indications of direction. The salient developments may be summarized as follows:

1. The enormous increase in the production of goods and services has been accomplished without a substantial increase in the fraction of the population engaged in gainful employment.

2. A steadily growing proportion of young persons up to 24 years of age are not engaged in gainful employment but are enrolled in school or college.

3. The economic establishment is growing more and more complex, thus putting a premium on a higher level of knowledge and skills.

4. Intermediate occupations involving working with ideas and peo-

ple, and concomitantly with things, are growing more rapidly than occupations involving working with things alone.

5. More than one-half of the individuals in the labor force are engaged in occupations for which they may appropriately be trained in college-level vocational programs.

6. There is a growing demand for vocational education of college grade for adults.

Two general conclusions may be drawn from these findings:

1. Evolution of the economic establishment is producing a rapidly growing number of occupations of a complex nature for which specialized training must be provided.

2. Many of these occupations require training through which the individual learns to handle ideas and to deal with people, as well as to handle things.

A type of training program which, in addition to producing competence in the skills required, includes effective training in the application of ideas and in dealing with people, would seem to be more and more strongly indicated. The foreman of a machine shop or a medical laboratory technician should know a certain amount of economics, psychology, political science, history, literature, and fine arts, not alone to make him a better parent, neighbor and friend but a better workman as well. There is evidence, which is presented in subsequent sections of this chapter, to show that due to the increasing life span of the population the young person of today can afford the time for such training, and that furthermore, due to the rapidly rising educational attainment of the population, a substantial proportion of this training must be given at the college level.

SOME EXPRESSIONS OF THE NEEDS OF INDUSTRY FOR PERSONS OF COLLEGE-GRADE VOCATIONAL TRAINING

Some light is shed on the needs of industry for employees trained vocationally at the college level by the data presented in "A Study of Technical Institutes," prepared in 1931 by the Society for the Promotion of Engineering Education.[4]

The authors of this publication state:

> To justify a need for the further development of technical institute education in America, it must be capable of accomplishing definite and desired objectives in furnishing employers with well-trained men and in preparing men to hold positions of considerable responsibility. This is difficult to measure in concrete figures, but data bearing directly upon the training needs of industry, with respect to the technical institute graduate, will be presented as they have been found.

[4] A Study of Technical Institutes. The Society for the Promotion of Engineering Education. Wm. E. Wickenden, Robert H. Spahr, and others. Lancaster, Pa. The Lancaster Press, 1931, ch. IV, p. 48-66.

These data are based on the experiences of the technical institutes in attempting to supply the demand, the expressions and experiences of business and industry in employing the graduates, a study of industrial employments in five major manufacturing industries, an analysis of potential fields for employment, and the extent to which needs for technically trained men are being met.

In 1926 the U. S. Bureau of Education (now U. S. Office of Education) conducted a survey of the needs of industry for technical institute trained persons in the State of New Jersey. The following question was asked of a number of manufacturing concerns:

"How many positions are there in your establishment for which you prefer personnel with training beyond that offered by the high schools in the following basic or technical fields?".

The authors of "A Study of Technical Institutes" have summarized the replies to this question as follows:

Table VII.—Ratio of technical institute men to 4-year college men preferred by 48 manufacturing companies in New Jersey [1]

Fields of employment	Number of men preferred from—	
	Technical institute (beyond high school—less than 4-year college)	4-year college or beyond
Mechanical	817	316
Electrical	116	111
Civil engineering	6	18
Chemical	345	148
Mining	6	4
Miscellaneous	12	0
Total	1,302	595

[1] A study of Technical Institutes. Op. cit., p. 83.

The desirable ratio of technical institute type of persons to 4-year college trained persons was found to be 2.8 to 1.

At about the same period the College of Engineering of Rutgers University made a similar type of survey, the completed questionnaires of which were turned over to the Society for the Promotion of Engineering Education. The data came from 21 manufacturing companies with a total of 34,000 employees. The size of these companies ranged from 300 to 6,500 employees. These data are summarized as follows:

Table VIII.—Ratio of technical institute men to 4-year college men desired by 21 manufacturing companies in New Jersey [1]

Types of education	Percent of total employees needed
Technical institute [2]	6.0
4-year college [2]	2.2
Elementary, manual and industrial courses	14.8

[1] A study of Technical Institutes. Op. cit., p. 85.
[2] Ratio (Technical institute men to 4-year college men), 2.7 to 1.

A number of other studies conducted at approximately the same time have yielded rather similar findings, viz, that the ratio of persons needed with less than 4-year technical training to those with 4 years of training was slightly less than 3 to 1.

Later evidence which appears in the Report of the Consulting Committee on Vocational-Technical Training appointed by the U. S. Commissioner of Education entitled "Vocational-Technical Training for Industrial Occupations" (Vocational Division Bulletin No. 228, 1944) indicates that the ratio has changed substantially in favor of the less-than-degree-level groups, and the ratio is now perhaps as much as 5 or 6 to 1.

LIFE SPAN OF POPULATION AND OTHER FACTORS AFFECTING VOCATIONAL PROGRAMS OF POST-SECONDARY SCHOOL YOUTH

The material presented above shows the steady growth toward a more and more highly trained working force. One of the byproducts of the pressures which have created this condition is the greatly increased length of time which the young person of today must spend in preparation for his life work. The extreme example is perhaps found in the field of medicine, where the student often must spend 9 to 10 years in training after leaving the secondary school. It has been stated that the increasing length of the training period takes away many of the years of life during which physical energy is at the highest, delays the establishment of the home, burdens the individual with additional cost of education, and has other bad effects. These questions have been raised with increasing frequency as an increasingly large proportion of 18- and 19-year-olds have remained in school. There is, however, some evidence available which tends to offset some of the effects referred to above. Both due to the fact that better-trained individuals tend to have a longer span of employment and because our population is tending to be distributed more heavily in the higher age groups, our labor force also is tending toward an older average age. Table IX shows the age distribution of gainful workers 16 to 44 years old for the period 1890 to 1930. While the gainful workers from the age group 16 to 24 years have increased by slightly less than 5 million in the 40 years involved, they comprised in 1930 only one-third of the total workers in the group whereas in 1890 they numbered two-fifths. The age group 25 to 34 years has remained fairly stable in proportion throughout the period although the number of workers has grown by almost 5 million. The age group 35 to 44 years has made the largest gain numerically as well as in proportion.

Table IX.—Age distribution of gainful workers 16 to 44 years old, 1890–1930 [1]

Age	Number (in thousands) and percentages				
	1890	1900	1910	1920	1930
1	2	3	4	5	6
Total 16 to 44 years	16, 161 100. 0	20, 223 100. 0	26, 619 100. 0	29, 837 100. 0	33, 491 100. 0
16 to 24 years	6, 297 38. 9	7, 681 38. 0	9, 729 36. 6	10, 233 34. 9	11, 168 33. 3
25 to 34 years	5, 797 35. 9	7, 162 35. 4	9, 402 35. 3	10, 362 35. 3	11, 823 35. 3
35 to 44 years	4, 067 25. 2	5, 379 26. 6	7, 488 28. 1	8, 742 29. 8	10, 500 31. 4

[1] Reassembled from Sixteenth Census—Population. Comparative occupation statistics for the United States, 1870–1940. Washington, U. S. Government Printing Office, 1943, p. 155.

The question can be raised as to what is becoming of the youth in this age group if they are less and less able to secure employment. A part of the answer to this question may be found in table X, which shows the employment status of young men only, 18 and 19 years of age, in 1920, 1930, and 1937. The significant item involves the number of these youth in school, 30 percent in 1937 as in contrast to 17.3 percent in 1930.

In table XI we find evidence to show that the lengthened period of schooling which has been inveighed against by many may not be so fraught with elements of disadvantage as is thought.

It will be seen from this table that youth of age 18, the usual age of graduation from the secondary school, may now expect many more years of life than their parents could a generation earlier. The life expectancy of white males 18 years of age has increased by 5.9 years in the period 1900–41, while white females 18 years of age in 1941 could look forward to 8.3 more years of life than if they had reached

Table X.—Employment status of young men, 18 and 19 years of age, in 1920, 1930, and 1937 [1]

Year	Total	Gainfully employed	In school	Not gainfully occupied and not in school	
				Status unknown	Unemployed
1	2	3	4	5	6
Number (in thousands):					
1920	1, 845	1, 420	319	82	24
1930	2, 284	1, 406	389	75	194
1937	2, 400	1, 118	720	----------	562
Percent:					
1920	100. 0	77. 0	17. 3	4. 4	1. 3
1930	100. 0	62. 1	26. 0	3. 3	8. 6
1937	100. 0	46. 6	30. 0	----------	23. 4

[1] Adapted from Walter C. Eells and others, Why Junior College Terminal Education Washington, D. C., American Association of Junior Colleges, 1941, p. 22, table II.

age 18 in 1900. The young man or woman reaching the age of 18 may therefore safely invest more time and money in additional education since the increased life expectancy will enable a longer period of work and of earning.

Table XI.—Expectation of life of men and women, white and negro, 18 years of age, in the population of the United States at selected periods from 1900 to 1941 by years [1]

Year or period	White		Negro	
	Male	Female	Male	Female
1	2	3	4	5
1941	49.7	53.6	41.7	44.3
1940	49.4	53.0	41.2	43.3
1930–39	48.5	51.5	39.6	41.4
1929–31	47.7	50.3	37.4	38.6
1920–29	47.5	49.2	38.2	38.3
1919–21	47.2	48.1	39.6	38.3
1909–11	44.3	46.5	34.7	37.4
1901–10	44.0	46.0	35.0	37.3
1900–02	43.8	45.3	36.3	38.0

[1] Ells, Walter Crosby. Increased Expectation of Life. *Junior College Journal*, 15:124–25, November 1944.

CERTAIN PERTINENT EDUCATIONAL TRENDS

No manifestation in American life has been more striking in recent generations than the tremendous broadening of educational opportunity for our people, both youths and adults. Enrollments in elementary, secondary, and higher education have constantly increased until today, excluding, of course, the effects of the war, a larger proportion of our population in the appropriate age groups is in school than in any other country of the world. The tables which follow are

Table XII.—Educational attainment of the population 20 years old and over, 1940 [1]

School years completed	20 to 24 years		25 years and over	
	Number of persons (in thousands)	Percent	Number of persons (in thousands)	Percent
1	2	3	4	5
Total [2]	11,500	100.0	73,734	100.0
No. school years completed	102	.9	2,800	3.8
Grade school:				
1–4 years	509	4.4	7,305	9.9
5 and 6 years	710	6.2	8,515	11.6
7 and 8 years	2,400	20.9	25,898	35.1
High school:				
1–3 years	2,672	23.2	11,152	15.2
4 years	3,666	31.9	10,562	14.3
College:				
1–3 years	1,056	9.2	4,075	5.5
4 years or more	385	3.3	3,407	4.6
Median school years completed		11.2		8.4

[1] Statistical Summary of Education, 1941–42. Washington, U. S. Government Printing Office, 1944. (Biennial Survey of Education in the United States, 1940–42. Vol. 2, ch. 2, p. 32, table 34.)
[2] Not including persons for whom school years completed were not reported.

aimed to review the effects of recent trends in education with special reference to the youth of immediate post-secondary school age.

Table XII shows the educational attainment of the population 20 years old and over in 1940, distributed between those 20 to 24 years of age and 25 years and over.

It is significant to note, that of our population 20 to 24 years of age in 1940, 31.9 percent had completed high school, 9.2 percent had studied from 1 to 3 years in college, while 3.3 percent had had 4 or more years of college work. Thus a total of 44.4 percent of those 20 to 24 years of age had completed high school or had some college work. The median school years completed was 11.2. Almost half the population in the age group is therefore able to offer high-school graduation as a basis for competing with their fellows for employment.

A striking educational development is seen in table XIII which shows the increase in secondary school enrollment and population, 14–17 years of age for the period 1889–90 to 1941–42.

Table XIII.—Increase in secondary school enrollment and population, 14–17 years of age, 1889–90 to 1941–42 [1]

Year	Enrollment		Population 14–17 years of age		Number enrolled per 100 population 14–17 years of age
	Number (in thousands)	Percent increase over 1889–90	Number (in thousands)	Percent increase over 1889–90	
1	2	3	4	5	6
1889–90	357		5,354		7
1899–1900	695	94.5	6,152	14.9	11
1909–10	1,111	210.6	7,220	34.8	15
1919–20	2,496	507.5	7,735	44.5	33
1929–30	4,799	1,241.4	9,341	74.5	51
1939–40	[2] 7,113	1,888.0	9,720	81.5	73
1941–42	[3] 6,928	1,835.0	[3] 9,663	80.5	72

[1] Statistical Summary of Education, 1941–42. Washington, U. S. Government Printing Office, 1944. (Biennial Survey of Education in the United States, 1940–42. Vol. 2, ch. 2, p. 9, Table 9.)
[2] Does not include 9,727 children in residential schools for exceptional children. Data for such schools are not available for earlier years.
[3] Estimated.

Enrollments in secondary schools have increased by 1,835.0 percent during a period in which the population 14–17 years of age has increased only 80.5 percent. Should this trend continue, we may see substantially all young people in this age group enrolled in school within a reasonable period.

Enrollments in vocational work of "less-than-college grade" may be compared with enrollments in secondary schools as a whole by consulting table XIV, which shows enrollments in federally aided vocational classes by type of program, for the years 1918, 1920, 1930, 1940, and 1942.

Table XIV.—Enrollment in all-day Federally aided vocational classes, by type of program and by year, 1918, 1920, 1930, 1940, 1942 [1]

Year	Type of program			
	Total	Agriculture	Home economics	Trade and industry
1	2	3	4	5
1918	42, 488	14, 453	8, 429	19, 606
1920	68, 902	31, 201	16, 457	21, 224
1930	261, 443	123, 685	66, 369	71, 389
1940	1, 096, 446	329, 308	600, 126	206, 922
1942	1, 204, 814	340, 540	696, 823	267, 451

[1] From Digests of annual reports of State boards for vocational education. Washington, U. S. Government Printing Office, 1945.

Equally as striking as the increase in secondary school enrollments has been the remarkable increase in graduations from high schools. Table XV shows the number of persons graduated from public and private high schools per 100 persons 17 years of age, for the period 1869–70 to 1941–42.

Table XV.—Number of persons graduated from public and private high schools per 100 persons 17 years of age, 1869–70 to 1941–42 [1]

Year	Number graduated from high school	Number 17 years of age [2]	Number graduated per 100 persons 17 years of age
1	2	3	4
1869–70	16, 000	815, 000	1. 2
1879–80	23, 634	949, 026	2. 5
1889–90	43, 731	1, 259, 177	3. 5
1899–1900	94, 883	1, 696, 146	5. 4
1909–10	156, 429	1, 786, 240	8. 8
1919–20	311, 266	1, 855, 173	16. 8
1929–30	666, 904	2, 296, 822	29. 1
1939–40	[3] 1, 221, 475	2, 403, 074	50. 8
1941–42	1, 343, 375	[4] 2, 625, 000	51. 2

[1] Statistical Summary of Education, 1941–42. Washington, U. S. Government Printing Office, 1944 (Biennial Survey of Education in the United States, 1940–42. Vol. 2, ch. 2, p. 12.)
[2] U. S. Bureau of the Census.
[3] Revised since originally published.
[4] Estimated.

In 1889–90 there were only 3.5 high-school graduates per 100 persons 17 years of age. This figure had increased to 51.2 graduates per 100 17-year-olds by 1941–42. With more than half the young people graduating from high school and thereby becoming generally eligible for college entrance, the question is raised as to the adequacy in scope and content of college-grade programs available for them.

The possibility of greatly expanded enrollments at the college level is indicated by a comparison of the rate of increase of such enrollments with the rate of increase of enrollments in secondary schools. While college enrollments have increased almost eightfold in the period from 1889–90 to 1941–42, high-school enrollments increased more than eighteenfold. In 1941–42 72 persons were enrolled in high

school for each 100 persons 14–17 years old, while only 14 persons were enrolled in college for each 100 persons 18–21 years old. It is obvious, therefore, that the curve of continuation in school suffers a sharp break at the period of high-school graduation—college entrance.

Table XVI shows the increase in college enrollment and population 18–21 years of age for the period 1889–90 to 1941–42.

Table XVI.—Increase in college enrollment and population 18–21 years of age 1889–90 to 1941–42 [1]

Year	Enrollment		Population 18–21 years of age		Number enrolled per 100 persons 18–21 years of age
	Number (in thousands)	Percent increase since 1889–90	Number (in thousands)	Percent increase since 1889–90	
1	2	3	4	5	6
1889–90	156		5,151		3
1899–1900	237	51.6	5,930	15.1	4
1909–10	355	126.6	7,336	42.4	5
1919–20	597	281.4	7,343	42.6	8
1929–30	1,100	602.2	9,026	75.2	12
1939–40	1,494	853.2	9,753	89.3	15
1941–42	1,408	798.7	[2] 9,922	92.6	14

[1] From Statistical Summary, op. cit., p. 24.
[2] Estimated.

A very sharp contrast is seen when the numbers graduating from college as shown in table XVII are compared with the numbers graduating from high school. Whereas, in 1941–42, 51.2 persons graduated from high school for each 100 persons 17 years of age, only 7.6 persons graduated from college for each 100 persons 21 years of age.

Table XVII.—Number of persons graduated from college per 100 persons 21 years of age, 1869–70 to 1941–42 [1]

Year	Number graduated from college [2] (in thousands)	Number of persons 21 years of age [3] (in thousands)	Number graduated per 100 persons 21 years of age
1	2	3	4
1869–70	9	725	1.3
1879–80	10	998	1.0
1889–90	14	1,246	1.2
1899–1900	25	1,426	1.8
1909–10	34	1,789	1.9
1919–20	48	1,821	2.7
1929–30	122	2,211	5.5
1939–40	186	2,367	7.9
1941–42	135	[4] 2,441	7.6

[1] From Statistical Summary, op. cit., p. 26.
[2] Bachelor's and first professional degrees only.
[3] U. S. Bureau of the Census.
[4] Estimated.

The number of students who drop out of colleges and universities, especially in the first 2 years, reaches a surprisingly large figure.

Table XVIII shows in percentages the loss of students by class years. The data upon which table XVIII and the two subsequent tables are based were secured in the course of a survey of student mortality conducted in selected universities by the U. S. Office of Education in 1936–37, as a part of Projects in Research in Universities. It should be noted that the percentages in table XVIII have not been adjusted to take into account the students who transferred to other institutions or at a later date returned to the same institution to complete their courses. The data are valid, however, as a representation of those students who did not continuously pursue their courses to completion in the institution in which they originally matriculated.

Table XVIII.—Percent of students leaving universities, by years [1]

Year	Percent
Freshman	33.8
Sophomore	16.7
Total leavng institution prior to junior year	50.5
Junior	7.7
Senior	8.9
Total leaving institution during 4-year period	62.1

[1] Adapted from College Student Mortality. Washington, U. S. Government Printing Office, 1938. (Office of Education Bulletin 1937, No. 11, fig. 4, p. 21.)

Taking student bodies as a whole, slightly more than one-third of all students are shown by the survey of the U. S. Office of Education to have left school during or at the end of the freshman year, and an additional one-sixth during or at the end of the sophomore year, thus making a total of slightly more than one-half who left before the beginning of the junior year. Losses in the two upper-class years drop sharply to 7.7 percent in the junior year and 8.9 percent in the senior year. The total loss during the 4 years amounts to 62.1 percent.

A somewhat more refined analysis of dropouts may be made by consulting Table XIX, which shows the differences in student mortality by college and school. Losses in colleges of arts and sciences and in six selected professional or specialized schools are studied here. In addition net figures are arrived at by taking into account those students who transferred to other institutions or who returned at a later date to their original institution.

It will be observed that the losses of students in the professional and specialized schools are not substantially lower than in the colleges of arts and sciences, with the exception of the schools of law. Mortality in these schools follows the general averages rather closely, approximately one-third dropping out before the sophomore year and a total of approximately one-half before the junior year. The figures for net losses (see column 12, table XIX), serve to make the picture look somewhat more favorable, although commerce and busi-

ness and home economics continue to show losses substantially greater than one-half for the 4-year period.

The Office of Education survey has also delved into the causes of student mortality. The results of the findings are displayed in table XX. A warning is in order to the effect that only limited interpretations can be drawn from the data in this table. In a large percentage of cases withdrawals had to be ascribed to unknown causes. In some categories these cases reach 50 percent or more of the totals. If the unknown cases had been ascertained and distributed appropriately among the various causes for withdrawal many of these categories would certainly have been substantially altered in size.

Table XIX.—Differences in student mortality by college or school [1]

College or school	Number of institutions	Number of students	Percentage of students leaving university during or at end of—					Leaving institution during or at end of 4-year period without degree	Transferring to another institution	Returning at a later date to institution	Leaving without transferring or returning at later date
			Fresh year	Soph. year	Fresh and Soph years	Junior year	Senior year				
1	2	3	4	5	6	7	8	9	10	11	12
Arts and sciences	20	6,255	36.6	19.1	55.7	8.2	3.1	67.0	13.3	8.2	45.8
Commerce and business	13	2,027	37.2	17.1	54.3	8.1	4.8	66.9	8.7	4.6	55.6
Home economics	6	435	27.9	24.8	52.7	8.9	3.2	64.8	.9	6.4	57.5
Engineering	16	2,547	34.8	15.4	50.2	7.4	4.1	61.7	9.8	6.8	45.1
Agriculture	12	969	32.8	16.6	49.4	7.3	5.2	59.9	5.2	6.9	47.8
Education	11	834	29.1	13.0	42.1	6.6	4.2	52.9	4.1	6.5	42.3
Law [2]	3	121	.....	22.6	.....	6.2	6.2	35.0	1.7	6.6	26.7

[1] Adapted from College Student Mortality, Washington, U. S. Government Printing Office, 1938. (Office of Education Bulletin 1937, No. 11) p. 28, table 7.
[2] Curriculum in law is 3 years in length.

Table XX.—Causes of student mortality by college or school [1]

College or school	Number of colleges or schools	Number of students	Percentage of students leaving university because of—								
			Dismissal for failure in work	Dismissal for disciplinary causes	Financial difficulties	Death	Sickness	Needed at home	Lack of interest	Miscellaneous causes	Unknown causes
1	2	3	4	5	6	7	8	9	10	11	12
Law	3	62	37.1	1.6	6.5	.....	4.8	.....	.....	12.9	37.1
Agriculture	13	565	23.7	1.0	15.8	1.0	3.9	2.0	3.0	11.3	38.3
Commerce and business	13	1,355	22.5	1.0	11.8	.5	2.8	1.0	9.4	12.7	38.3
Education	11	439	22.3	.7	11.4	.2	3.4	.9	2.0	8.8	50.3
Engineering	16	1,544	19.9	1.1	10.7	.6	3.5	.3	3.2	12.7	48.0
Home economics	6	271	15.5	.7	14.4	.7	6.4	2.9	4.1	19.5	35.8
Arts and sciences	20	3,921	15.3	1.1	11.8	.5	3.4	.6	5.9	12.5	48.9

[1] Reproduced from College Student Mortality. Washington, U. S. Government Printing Office, 1938. (Office of Education Bulletin 1937, No. 11) p. 52, table 17.

Despite the limitations of the data on causes of student mortality certain fairly safe assumptions may be made. In general the highest proportion of losses, except for unknown causes, was due to "dismissal for failure in work." This figure was highest in the field of law and lowest in home economics and arts and sciences. Losses in engineering for this cause were approximately one-fifth of the known causes. A second category, that of "lack of interest," should perhaps be coupled with that of "dismissal for failure in work" as the causes most directly bearing upon the question of suitability of the program to the student. Losses in this category range from 9.4 percent in commerce and business down to 2 percent in education.

In reviewing education trends of recent decades a number of significant characteristics present themselves:

1. Almost three-fourths of all young persons 14–17 years of age are enrolled in secondary schools today, using the last prewar years as the standard.

2. The number graduating from secondary schools each year equals more than one-half the number of persons 17 years of age.

3. Secondary school enrollments increased by approximately 48 percent in the decade 1930 to 1940, while the number of graduates of secondary schools increased by 86 percent in the same period.

4. During the period 1930 to 1940 while secondary school enrollments were increasing 48 percent, college enrollments increased 36 percent.

5. During the decade 1930 to 1940 between 25 and 30 percent of students graduating from high school entered college.

6. In 1940 while the high schools enrolled almost three-fourths the number of persons 14–17 years of age, the colleges enrolled 14 percent of those 18 to 21 years of age.

7. Approximately one-third of all entering college students leave school before the beginning of the sophomore year, and a total of approximately one-half before the beginning of the junior year.

These findings seem to point the way to the future fairly specifically. If the number of high-school graduates continues to increase in the immediate post-war period at the same rate as during the 20 years from 1920 to 1940, a general high-school education will be an accomplishment shared by perhaps 85 to 90 percent of all young people. If this should be the case, and indications are that this will be substantially the case, there will be great pressure upon the institutions of higher learning to provide programs to meet a considerably increased enrollment. The problems posed for college and university administrators by increased enrollments are numerous and serious. While it is of course possible to continue to graduate larger and larger numbers from arts and sciences programs, it is not possible to envision greatly increased enrollments in many of the professional

areas. Indeed, it appears that under immediate prewar conditions some of these areas were already producing more graduates than could easily be absorbed.

These general conclusions therefore seem reasonably valid:

1. The youth of tomorrow must expect in increasing proportion to take his specialized vocational training after the high school, rather than after the grammar or junior high school, since the substantial majority of his fellows will be high-school graduates. This development is in many ways comparable to that which has occurred in the professions during the past 50 years. High-school graduation was at one time regarded as a sufficient preprofessional basis for medicine whereas 3 to 4 years of college are now commonly required. As occupational and educational standards are raised the necessary general basis for vocational training will continue to grow away from the elementary school.

2. Greatly increased numbers of students seeking to enter college in the future cannot expect to find places in the professional schools alone since large numbers of graduates of many of these schools can hardly be absorbed.

3. Colleges and universities, junior colleges, technical institutes, and related preparatory agencies must increasingly provide vocational programs to meet the growing needs of youth. These programs must produce vocationally competent graduates and at the same time provide them with adequate social knowledge involving college-grade instruction.

Chapter III. GENERAL NATURE AND EXTENT OF EDUCATIONAL PROGRAMS

PREVIOUS chapters have described the emerging vocational pattern in America and set forth the need for new forms of vocational education that are adapted to the changing situation. Institutions of college level are making a strong effort to meet the need, an effort which is being put forth in diverse ways and from various sources. A considerable body of experience has been accumulated, and an extensive literature is at hand for those who wish to study what is being done. Thus there is available a basis for planning and direction in the near future.

In order that vocational education of college grade may be set forth with some degree of concreteness, descriptions have been prepared of 18 programs which are found in selected technical institutes, junior colleges, and colleges and universities. These institutions, which are widely distributed geographically, have been chosen to illustrate various arrangements now in operation. The descriptions are included in part II of this report.

This chapter aims to set forth some of the significant characteristics of vocational education of college grade. It is based on the literature of the field, on observations by the staff of the Division of Higher Education, and on the 18 descriptions of programs.

PURPOSES AND OBJECTIVES

The general purpose of vocational education of college grade is to prepare men and women for definite vocations requiring intellectual maturity represented by study beyond the twelfth grade. In reality, however, the purpose is to develop in the student salable skill in doing something, and, quite as much, the ability of the individual to adjust himself to the changing civilization in which he lives, and to contribute his part to the advancement of that civilization. For the accomplishment of this broad purpose the student needs to acquire certain definite skills which lead to vocational proficiency in a broad sense. He needs to know the "why" of vocations as well as the "how". He should be given a view of the social and economic relations and implications of the use of those skills, and sufficient contact with the cultural and humanitarian aspects of life to enable him to live intelligently, happily, and with a considerable degree of self-dependence.

This purpose is reflected by the statement concerning the Rochester Institute of Technology which "provides general education and technical training for the living of a satisfying life and the earning of a

respectable living, not as two processes but as one, closely integrated so that graduates may successfully take their places in the community as contributing citizens."

At Los Angeles City College the terminal curricula and courses "are designed to develop competency in the practical knowledge, the principles of practice, and the general nature of the occupational field of the student's choice" and he is also provided with "a workable and salable skill in this occupational area which will enable him to enter and hold a position with capacity for improvement and promotion." The aim is "to develop competency in the requirements of successful social, civic, personal, and occupational living."

This broad view of the purpose to be accomplished through vocational education of college grade is also reflected in the philosophy of the Division of Business Administration, Western Reserve University, in its program, which is "that people training for vocations should have some background knowledge of our social and political, as well as our economic system," and "that people in business should be taught how to live as well as how to make a living."

These statements, and others that might be cited, indicate the general character of vocational education of college grade and suggest why it should be carried on in the atmosphere of institutions of higher education. They express a concept that is not narrow and limited in outlook, but rather one that places emphasis on developing in the student the breadth of view and the flexibility and adaptability which enables him to cope with a changing industrial society, and to assist in directing its progress through more intelligent study and planning.

Not all institutions offering vocational education of college grade base their programs on the broad concept stated above. Some of them stress more the strictly vocational and so-called practical aspect, on the assumption that the greater concern should be with immediate proficiency in doing things. They tend to a high degree of specialization in a particular field or occupation. This specialized point of view is perhaps more apparent in the technical institute type of institution than in institutions which provide programs in widely diverse fields, including general education.

The development of vocational education programs in colleges and universities represents an evolution of the point of view that higher education should serve the needs of all citizens who can profit thereby. The demand for this broader conception of higher education increases with the growth in complexity of commercial, industrial, and social relationships which develop in a fast moving technological age, an age which is characterized by a great increase in wealth and in living standards. Higher education does fairly well by perhaps one-third or one-half of the youth, those who fit into the traditional

patterns of college and university work, but a very large number of young people—some who lack intellectual capacity or interest to pursue the traditional college programs, and some who want something that the colleges and universities do not generally offer—the institutions of higher education fail to reach. These young people, particularly those who are not academically inclined, are left largely to shift for themselves. The idea is now gaining currency that youths should be taken as far along the educational highway as they can travel advantageously, even though their purposes may not be in line with traditional baccalaureate requirements.

The point of view is expressed in a statement by Chancellor C. S. Boucher, of the University of Nebraska:

> There should be provided for every young person the opportunities and facilities appropriate and necessary for him to become the happiest and most useful citizen that it is possible for him to be. To this end, however, it is necessary to provide a greater variety of types and lengths of training programs than is now generally provided.

With this idea in mind the University of Nebraska, beginning in September 1945, offered a number of 2-year programs for youths who were interested in other intellectual attainments than those typically offered by colleges and universities in the past.

The above discussion may appear to stress vocational education for youth, largely for those who have not yet entered upon gainful employment. One should not lose sight of the fact that the number of employed persons who have completed secondary education far exceeds the number of young people in college, and that for these employed persons vocational education of college grade can render significant service. In fact, practically all the programs described in part II of this report are for the employed as well as the full-time student groups. The purposes of the programs for these more mature individuals are to improve their efficiency, prepare them for new types of work, and elevate them to more advanced and better paying positions. This is well illustrated by the majority of the students in the Technical Institute of Purdue University.

The purposes and objectives of vocational education of college grade should also be conceived in terms of services which society must have. In order that goods may be produced and distributed, in order that the services may be rendered which are essential to individual and social welfare, persons must be prepared for the jobs and positions involved. The Rochester Institute of Technology definitely states that one of its two basic objectives is "to render service to the community by giving training in specific areas where competently trained people are needed." Likewise the Technical Institute of Purdue University provides a program "to serve the people and industries of the State" where there is need for technical training.

TYPES OF INSTITUTIONS OFFERING EDUCATIONAL PROGRAMS

Vocational education of college grade is currently offered in many different types of higher institutions, under various names and titles, and under diverse auspices. The programs may be classified roughly into three general groupings: (1) Technical institute type programs; (2) junior college terminal programs; and (3) programs in degree-granting institutions. A possible fourth group consists of schools offering home study work exclusively. There is some overlapping in these groups, but the classification serves a practical purpose in facilitating discussion.

Technical institutes.—The technical institutes had their origins in the "mechanics institutes" established in the first half of the nineteenth century. They differ greatly in nature.

The outstanding pioneer investigation of this type of education was reported in 1931 under the title *A Study of Technical Institutes.*[1] In the main the findings apply today as they did 15 years ago. The study delineated the field and service of the technical institute and suggested its future course. It has been a stimulating factor in the evolution of this form of education.

Statements concerning the total number of technical institutes vary in accordance with the definitions used. A survey reported in 1945 included the names of 76 of these schools, grouped as follows: State maritime academies and Federal schools, 10; State and municipal technical institutes, 14; privately endowed technical institutes, 18; and proprietary technical institutes, 34.[2] A total day enrollment of 10,538 students and a total evening enrollment of 8,337 students were reported by 43 of these institutions for the year 1944–45. Another tentative list, prepared for private use, names 247 technical institutes, as follows: Privately endowed institutes, 21; State or municipally supported institutes, 16; YMCA schools, 9; junior colleges, 93; extension divisions and evening sessions of colleges and universities, 28; training programs and schools associated with industries, 24; proprietary schools, 36; schools operated by the United States Government, 20.[3]

Despite the numerous differences among technical institutes, their general characteristics are easily identified. Typically, high-school graduation or equivalent preparation is required for admission, but job aptitude and experience are also taken into account. The work lies in an instructional area between that offered in technical high

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[1] Published by the Society for the Promotion of Engineering Education, February 1931. The study was a collateral project to the investigation of engineering education.

[2] Technical Education News, Special Survey Number, June 1945. New York: McGraw-Hill Book Co., 1945.

[3] For a rather comprehensive list, see Engineers' Council for Professional Development, Report of the Subcommittee on Technical Institutes, K. L. Holderman, Secretary of the Committee, Pennsylvania State College, State College, Pennsylvania.

or trade schools, and in fully developed professional schools. Institute work is terminal or semiterminal in nature and does not lead to baccalaureate or professional degrees.

The technical institutes serve persons who wish to prepare intensively in 1, 2, or 3 years for vocations and job services demanding more preparation than that required of skilled craftsmen and less than that required of graduate engineers or agriculturalists. The institutes also serve the in-service training needs of adults for further training. These schools prepare chiefly for technical, supervisory, or managerial services. Most of their instruction is direct and practical and is based upon the usages of industry and related occupations. It is aimed at preparing individauls for specific technical positions or lines of activity rather than for broad sectors of engineering. Moreover, it is given by staff members with practical job experience and personal qualifications appropriate to their tasks in shops and laboratories of wide variety.

Most of the technical institutes are located in the highly industrialized areas of the Nation; that is, in the more northerly States east of the Mississippi River, and in the Pacific Coast States.

State Maritime Academies.—The State maritime academy is a special form of technical institute, which prepares officer personnel for the United States Merchant Marine. There are now five of these academies, established as follows: (1) New York, 1875; (2) Massachusetts, 1893; (3) Pennsylvania, 1919; (4) California, 1929; and (5) Maine, 1941.

These State maritime academies are joint enterprises of particular States and the Federal Government. As early as 1874 the Congress, in order to encourage the establishment of marine schools, authorized the Secretary of the Navy to furnish a vessel of the Navy with all her equipment to be used for a nautical school at each of any of six designated cities. The President was also authorized to detail naval officers as instructors or superintendents of such schools. In 1911 the Congress provided for nautical schools in 10 designated ports and authorized for each school an annual appropriation of $25,000 or so much thereof as the State or municipality matched. Since 1911 some additional Federal appropriations have been made for these schools.

The States own and operate the State maritime academies through boards of trustees or similar boards and in some States the academies are directly under the Board of Education of the State. The States also appropriate funds for their support. The Federal supervision of the five schools is a function of the training organization of the War Shipping Administration.

Graduates of the State maritime academies obtain licenses as third mates or third-assistant engineers in the United States Merchant

Marine. They also receive commissions as ensigns in the United States Maritime Service, and the Navy, to date, awards them commissions as ensigns in the United States Naval Reserve.

Junior colleges.—Apparently the term "junior college" was first used by President William Rainey Harper of the University of Chicago about 1896 to cover the work of the freshman and sophomore years of the college or university. Some years later he used it also to designate an institution entirely separate from the university usually offering the first 2 years of college or university work.

Since that early day the junior college has become widespread. A considerable body of literature is available concerning it, and its changing purposes and functions have become more generally understood. The national organization of these institutions is the American Association of Junior Colleges, established in 1920.

Today junior colleges offer one or more of several kinds of curricula: (1) Those aimed at covering the freshman and sophomore years of 4-year curricula, for students who will transfer to other institutions where they continue study for degrees; (2) pre-professional curricula, which prepare students to enter professional schools; (3) terminal curricula, aimed at satisfying the needs of students who do not intend to pursue more advanced study. The terminal curricula may provide general education or they may offer preparation for vocations; (4) curricula to serve returning veterans and others with maturity and experience who need service in overcoming any educational deficiency for advanced vocational training; (5) curricula to provide vocational education of college grade for daytime employed adults, especially during evening hours.

A large and increasing number of junior colleges are offering terminal curricula and courses in great variety. Some of these colleges specialize to such an extent in one or more vocational areas as to lead to their classification under various other categories, such as technical institutes, agricultural schools, and the like. The American Association of Junior Colleges in 1939 appointed the Commission on Junior College Terminal Education to make a Nation-wide study of this field. Its work resulted in an extensive report in three monographs: (1) The Literature of Junior College Terminal Education; (2) Present Status of Junior College Terminal Education; (3) Why Junior College Terminal Education, all published in 1941. Other publications include Associate's Degree and Graduation Practices in Junior Colleges (1942) and Organization and Development of Terminal Occupational Curricula in Selected Junior Colleges (1944). The final report is expected to appear in the near future.

Typically, admission requirements are about the same in junior colleges as those for regular 4-year colleges. Predominantly, curricula are 2 years in length, although 1- and 3-year curricula of college

grade are to be found, and there is growing interest in the 4-year conjoined high-school and college-grade institution, which usually offers an integrated program covering 4 years of education beginning with the eleventh grade of school. A rapidly increasing number of junior colleges are granting the associate in arts degree at the end of 2 years of work, and most others grant diplomas or certificates indicating the completion of the work offered.

A total of 584 junior colleges is listed in the Junior College Directory, 1945, compiled by the American Association of Junior Colleges. These institutions are located in all but 2 States; California and Texas, leading in numbers with 71 and 48, respectively. Four hundred forty-three junior colleges are listed in the Directory of the United States Office of Education for 1944–45, their control being indicated as follows: State, 42; district or city, 168; private nondenominational, 88; denominational, 148. Nineteen are exclusively for Negroes.

According to the U. S. Office of Education *Biennial Survey of Education, 1940–42*, junior colleges which supplied data had increased in number from 52 in 1919–20, with an enrollment of 8,102, to 461 in 1941–42, with an enrollment of 141,272.

The extent to which junior colleges provide curricula of a vocational nature is indicated in table XXI. The data on which this table is based were obtained from questionnaires filled out by 443 accredited junior colleges. Of the 443 institutions completing the questionnaire, 308 offered terminal curricula.

Colleges and universities.—Colleges and universities which grant degrees offer vocational education of college grade under various administrative arrangements. In some institutions the work is carried on in the "lower division." In other cases the programs are under the control of the extension division and are offered both as on-campus and as off-campus work. The latter type of work is in some cases offered in the traditional form of extension programs, while in other cases it is offered in permanently organized off-campus centers. A number of institutions have organized the technical institute and other types of terminal vocational programs on their own campuses and within the regular institutional framework. Many urban colleges and universities offer vocational courses of college grade to evening classes. Correspondence instruction is also offered by colleges and universities.

For many years the land-grant colleges and universities have offered courses and curricula of less than 4 years, practically all of which had specific vocational objectives. The survey of these institutions made in 1927–30 reported that: (1) in agriculture, at least 42 offered such courses; (2) in engineering, 21 offered evening instruction which did not lead to degrees and 31 offered short-term and

Table XXI.—Number of junior colleges offering each terminal curriculum and number of students enrolled, 1938–39 [1]

Curriculum	Institutions offering curriculum	Students enrolled	Curriculum	Institutions offering curriculum	Students enrolled
1	2	3	1	2	3
Total	....	41, 507			
General cultural	137	6, 208	Fine arts	162	3, 406
Agriculture	67	1, 673	Architecture	29	214
General	57	1, 254	Art	97	1, 354
Floriculture	7	38	Fashion illustration and costume design	3	31
Forestry	33	381	Interior decoration	3	30
Business	241	14, 611	Music	141	1, 409
General	183	7, 068	Photography	10	56
Accounting	11	490	Speech and dramatics	20	312
Banking and finance	4	42	Health services	84	1, 608
Business Law	1	20	Civic health	1	108
Hotel and restaurant management	4	83	Laboratory technology	6	46
Insurance	12	46	Medical-secretarial	33	460
Management	1	62	Nursing	59	975
Merchandising	7	290	Physical therapy	1	14
Salesmanship	31	395	Home economics	106	1, 387
Secretarial	164	6, 068	Journalism	86	508
Engineering and technology	90	4, 449	Public service	182	6, 500
General	51	1, 650	Civil service	2	8
Agricultural engineering	2	59	Library aids	47	197
Air conditioning	2	10	Military service	3	9
Auto mechanics	6	67	Physical education	62	335
Aviation	41	1, 107	Police officers	6	109
Building trades	8	142	Recreational leadership	19	132
Chemical engineering	8	273	Social service	28	191
Civil engineering	15	106	Teaching	138	5, 519
Drafting	3	30	Miscellaneous	49	968
Electrical engineering	25	294	Cosmetology	3	3
Geology	2	9	Mortuary science	10	36
Mechanical engineering	29	539	Parish secretary	4	23
Mining	3	16	Religious education	9	97
Navigation	2	7	Printing	4	23
Oil technology	5	109	Terminal fields not stated	24	783
Radio engineering	8	102			
Welding	1	30			

[1] Adapted from Walter C. Eells *and others*, Present Status of Junior College Terminal Education. Washington, D. C., American Association of Junior Colleges, 1941, p. 49, table IV.

special courses in residence; and (3) in commerce and business, 3 offered 1-, 2-, or 3-year nondegree curricula, the specific purposes of which were to prepare students for general office work or to produce bookkeepers or stenographers.[4] Apparently no nondegree curricula were found in home economics, but the report concluded that for many occupations in home economics the vocational preparation might well be given on the lower division or junior college level and that curricula should be devised for this purpose.[5] What development has occurred since that time in the land-grant colleges and universities, with respect to vocational curricula of less than 4 years, is not known.

The extension work of degree-granting colleges and universities takes several forms: (1) Instruction of classes organized at various

[4] Survey of Land-Grant Colleges and Universities, directed by Arthur J. Klein. U. S. Office of Education Bulletin 1930, No. 9. 2 vol.

[5] Ibid, vol. I, p. 964, 969.

centers off the main campus; (2) instruction in the evening and on Saturday on the campus; (3) correspondence instruction; and (4) less formally organized instruction such as that given through forums, lectures, and motion pictures. Vocational offerings are provided principally through the first two named forms of instruction.

Colleges and universities in every State offer class extension courses. State universities and institutions of higher education in large cities are especially active in such work. Some of the students take extension courses to earn credit toward degrees, but other students enroll in classes to gain knowledge and understanding that will advance them in their vocations. Much of the extension work consists of short courses which are not parts of organized curricula or course sequences, but some of it is so aranged as to lead to certificates and diplomas. High-school graduation or its equivalent is the normal requirement for admission. Courses or curricula are often organized on the basis of specific needs of business, industry, or agriculture, or of groups of students with specific needs, and are more practical and direct in methods of instruction than the usual courses leading to degrees in the same fields. Many students take extension courses which carry credit toward degrees.

The number of persons served by higher education institutions through class extension activities is indicated by the fact that in 1939–40, 214,027 men and women were enrolled in the classes of college grade, and 54,841 in classes of subcollege grade.[6] Short courses, usually not more than a week in length, were taken by 101,283 persons. The land-grant colleges and universities alone enrolled 62,300 students of college grade in extension courses in 1943–44. A large proportion of such students were undoubtedly enrolled in vocational programs.

In most States one or more institutions of higer education offer college-grade courses by correspondence. They also offer a considerable amount of correspondence instruction of noncollege grade. Colleges and universities in 1939–40 reported enrollments of 78,209 in college-grade correspondence work and 15,304 in noncollegiate work.[7] The land-grant colleges and universities reported 48,247 students in correspondence courses for the year 1943–44.

Engineering, Science, and Management War Training.—The Engineering, Science, and Management War Training Program, conducted by colleges in cooperation with the U. S. Office of Education since 1940, has had certain of the characteristics of a college-grade vocational or semi-professional program. This program differed from the college-grade vocational programs generally treated in this report in that it has offered short courses rather than complete cur-

[6] Data supplied by the Statistical Division, U. S. Office of Education.
[7] Ibid.

ricula. The principal requirements for admission to the ESMWT program have included "high-school education or its equivalent." The program was restricted by law to the four fields of engineering, chemistry, physics, and production supervision "in fields essential to the national defense." A report states: "Although the instruction in these programs has been of college grade, it has not been intended as a substitute for regular courses which lead to college degrees. Hence, ESMWT courses, except under special conditions, . . . do not carry college credit. Those who complete the training successfully are given certificates which are widely accepted as indicative of proficiency in the specified technique, but no effort is made to provide the broad underlying theory customarily included in credit courses leading to professional degrees."[8]

More than 1,500,000 different individuals have received training in the ESMWT program since it began as EDT in 1940. The program reached its peak in 1942–43 when 596,134 persons were enrolled in 216 higher institutions.

The ESMWT was concluded on June 30, 1945. It is of interest here because of the stimulus it has given to vocational education of college grade and because it has shown one way in which such work can be organized and managed. A number of colleges and universities have made plans to continue or develop programs similar to that of the ESMWT.

Proprietary vocational schools and colleges.—A sizable proportion of vocational education of college grade is obtained by youth and adults through proprietary schools—schools owned by individuals and corporations and operated for profit. Reference has been made above to the proprietary technical institutes, one list naming 34 and another naming 36 which belong in this category.

Another type of proprietary institution which belongs in this general area of vocational educational is the business school or college. Not all of these institutions do work of college grade, but certainly many of them operate on the college level. A report made by the Office of Education for the year 1932–33 included 651 of these schools with 3,231 instructors and 102,286 students.[9] Approximately 10 percent of the students had only an eighth-grade education or less, about 13 percent had some high-school work, 64 percent had graduated from high school, and about 13 percent had some college training. Inasmuch as an increasing proportion of the population has been graduating from high school, the number of students in business schools and colleges with less than a high-school education has been decreasing rapidly.

[8] Clark, William T. College Level War Training Completes 4 Years of Activity. *Higher Education*, 1: 5–6, Jan. 1, 1945.

[9] *Biennial Survey of Education in the United States*, 1932–34, chapter VII, Statistics of Private Commercial and Business Schools. (U. S. Office of Education Bulletin 1935, No. 2.)

Information on private business schools as of November 1942 indicates that 1,073 schools enrolled 80,508 students and were taught by 7,071 teachers.[10] At the time it was estimated that 1,720 such schools were in operation and that they enrolled 123,836 students. The schools vary in size from a small one with one teacher and 11 students to larger ones with more than 1,000 students and 20 or more teachers.

A third group of proprietary institutions which offer vocational instruction, some of which is of college grade, consists of correspondence or home study schools. Such schools are of long standing in the United States. Some of them are widely known, but little is known of them as a whole. An investigation of these schools was made at the instance of the Carnegie Corporation of New York and published in 1926.[11] It was stated that at the time more students were enrolled in these private correspondence schools than were enrolled in all resident colleges, universities, and professional schools in the country combined. These young adults, with a median age of 26 years, were taking the training with the primary objective of improvement for their work.

CHARACTERISTICS OF PROGRAMS

The principal characteristics of vocational education of college grade may be observed in the main from the 18 descriptions of programs contained in part II. Further information is available in scattered sources, such as catalogs of the institutions and reports of surveys and special studies. The following discussion is based largely upon materials in part II.

Organization and administration.—When given in other than specialized institutions such as technical institutes, vocational education of college grade is organized and administered in diverse ways, particularly in degree-granting institutions. It may be on the main campus or off the campus. When on the campus, this work may be under the direction of a lower division or a general division or college, or it may be caried on by various divisions or schools within an institution. In view of the special and unusual problems that are often found in this form of education, it is rather common to find that considerable leeway is granted to officials in charge of the work to make the necessary adjustments and adaptations required to make the vocational programs a success.

The program of vocational education of college grade off the campus is usually under the direction of the extension division, and typically it is organized in well-established centers in cities. The

[10] Information supplied by J. S. Noffsinger, Director, National Council of Business Schools.

[11] Noffsinger, John S. Correspondence Schools, Lyceums, Chatauqua. New York. The Macmillan Co., 1926.

controls of the program may be highly centralized, as at Purdue University, or the centers may have much latitude in the curricula offered. A well-organized center provides stability and continuity of program, and it greatly facilitates community, business, and industrial relationships.

A number of colleges and universities cooperate with other institutions and agencies in their vocational offerings. An example of this is seen in the Northeast Junior College of Louisiana State University, where the shop work for the technical courses is taught by the Ouachita Valley Vocational School. At Wayne University a curriculum in banking is offered in cooperation with the American Institute of Banking, and one in industrial training is sponsored jointly by the university and the Chrysler Corporation.

Curricula.—Earlier in this chapter the names of more than 50 different terminal curricula in junior colleges were listed. (See table XXI.) Others are reported by the 18 institutions, among which are: airline operation and management, advertising and selling, dental assistant preparation, engine mechanics, general construction, organization and operation of small business, radio broadcasting and production, and radio technics.

These curricula vary greatly in length, but 2 years is the most typical. Some 1-year curricula are found, and occasionally a curriculum covers a period of 3 years. Other curricula may be of less than 1 year duration. In some instances the curricula may not be publicized as covering a stated period of time, the student pursuing a subject or combination of subjects until he attains his objectives. In view of the great variation in the requirements for training in the different vocational fields, it is understandable that the vocational curricula should be of different lengths.

The vocational curricula are usually different from those leading to degrees not only with respect to length, but also in several other respects. In the technical and enginering fields the shorter curricula usually emphasize the applied and practical rather than the basic or theoretical phases, as in the technical institute of Purdue University. Effort is made in some curricula to provide a broader foundation of science, as at the Farmingdale New York State Institute of Agriculture. At the University of Minnesota it is said concerning the shorter curricula in technology that although the work is just as intense as that given in the professional engineering courses and requires equal application on the part of the student, the material taught is narrower in its scope and is pointed more directly toward practical applications.

Many of the vocational curricula are different from the degree curricula in not paving the way for more advanced study, although that is not always the case. Institutions sometimes announce that

the shorter curricula cannot be applied toward degrees, and this is particularly true for the offerings in the technical fields. However, in other colleges and universities credit earned in shorter curricula may be used later in obtaining degrees, a practice that is not uncommon in secretarial training and business administration. Here arises a problem that will no doubt receive attention as shorter curricula are pursued by more young people.

Some of the institutions outline their vocational curricula in detail and require students to follow them closely, but in other institutions students have much freedom of choice as to subjects. The individual interests of the students are taken into account by most of the colleges and universities, some of them making it a special point to arrange each student's program on an individual basis. At the Western Michigan College of Education programs are set up in units of instruction whose function is to develop employable skills, and combinations of selected units make up 1-year and 2-year curricula. Tuskegee Institute provides opportunity for "unclassified instruction," which affords special work in phases of trades and industries are related technical areas to persons in keeping with their abilities. Naturally the need for close prescription and rigidity of subject requirements in a curriculum will vary with different fields of study. A short curriculum in dental hygiene, the graduate of which later takes an examination for a license to practice, is more likely to be rigid than a short curriculum in agriculture or secretarial training.

General Curriculum Plans Vary.—One plan is to lay a general foundation in the first part of the curriculum and to follow this with more specialized study. For example, at the Farmingdale New York State Institute of Agriculture, the student devotes the first year to basic studies in general agriculture and during the second year he concentrates in his major field. Likewise, in the Technical Institute of Purdue University, which offers three curricula, the first year's work consist largely of fundamental courses which are common to all curricula, and the work of the second year is largely in a specialized field. A similar observation may be made concerning the technical curricula at the University of Minnesota. This plan is rather common where curricula are definitely outlined. Quite the opposite is found where the student, perhaps with the advice of a counselor, makes up his own program from courses available.

The vocational curricula of college grade usually consist of two types of courses: vocational courses, and general or cultural courses. At the Los Angeles City College the ratio, in general, is 2–2–1, that is, 2 units of occupational training to 2 units of general education and 1 elective unit from either the occupational or the general education courses. At the Technical Institute of Purdue University 50

percent of the curriculum is in fundamental but highly functional courses, 35 percent is in a technical field, and 15 percent is in "functional courses" in nontechnical fields such as economics of industry, geography of raw materials, speech, accounting, psychology and human relations, and urban sociology. At the University of Nebraska the ideal is that approximately 25 percent of the course requirements should be of nonvocational or general education type and about 40 to 50 percent should be along the line of the student's special interest, but much flexibility is allowed in arranging details. The idea is "to provide opportunities for students to develop skills in the respective fields while retaining in some measure the ideals of cultural progress." Social and civic aspects of education receive special attention at several institutions.

Several methods have been followed in devising the vocational curricula. One practice is to select from 4-year curricula the more practical courses and parts of courses as the basis for the shorter curricula. Another practice is to obtain the asistance of advisory committees made up of managers, supervisors, foremen, and others engaged in the occupations for which curricula are offered, these advisers bringing to the institution their judgment and advice as to what should be taught, as was done at Purdue University and Los Angeles City College. A third practice is to make job analyses of the activities of workers in the various occupations and to base the content of instruction upon these findings, as was done at the Rochester Institute of Technology, the Los Angeles City College, and Stephens College. The maintenance of close relations with the occupations for which preparation is given is generally regarded as essential to sound instruction.

A unique feature of some vocational curricula is a requirement of a certain amount of practical experience. Thus at the Farmingdale New York State Institute of Agriculture the students during the first summer participate, under the supervision of their regular classroom instructors, in all of the operations that are in season. At the close of the senior year the student, with the guidance of the institution, secures employment in an approved paid farm job or some other job related to his training, where his work is subject to Institute inspection. Some curricula are designed for men and women who are at work in the occupations where they obtain the practical experience, as in the case of the instruction in banking and in industrial training at Wayne University. The cooperative plan is used by some institutions for some of their curricula, the students spending a scheduled part of their time working in the occupations for which they are preparing. An example is seen in the Rochester Institute of Technology.

The courses of the curricula are evaluated in terms of semester

hours, credits, industrial credits, or points. Sometimes some term, other than semester hours, is used to differentiate credit for courses of short curricula from credit for courses of degree curricula.

The completion of curricula is recognized by granting diplomas and certificates. Titles are given by some institutions, such as associate in arts and technical aide.

Admission requirements.—The typical requirement for admission to the 18 institutions whose programs are described is graduation from a 4-year high school. However, many exceptions are made. A student may enter the Technical Institute of Purdue University if he has satisfactorily completed 14 units of high-school work and is recommended by the principal of the high school last attended. Others who feel they are qualified to complete the program of study may also be admitted by action of the director. Applicants who do not satisfy all entrance requirements but who give evidence of ability to pursue the work offered are often admitted as special students. At the Rochester Institute of Technology high-school graduation is not a prime requisite for entering, but less than 1 percent of those who enter are not high-school graduates. Likewise, at Pennsylvania State College practically all students registering for the vocational curricula were high-school graduates, but others whose practical experience and abilility enable them to carry the work are also admitted, each student's qualifications being judged in an individual interview.

It is by no means unusual to find that colleges and universities require their students of vocational curricula to meet exactly the same conditions as are required of the students in degree curricula. For example, students taking the 2-year technical programs in the Institute of Technology of the University of Minnesota must rank in the upper 60 percent of their respective high-school graduating classes and have a specified range of subjects, as is also true of other freshmen entering the Institute. Likewise, at the University of Nebraska registration for vocational curricula is open only to students who can meet the regular entrance requirements of the University.

Students enrolling in vocational curricula at Wayne University must meet college admission requirements, and those applying immediately following graduation from high school must be recommended by the principals of their high schools, who are asked to take into account such factors as the student's interests, aims and objectives, capacities, educational background, and personality.

Special requirements are sometimes made. For example, at the University of Nebraska all students who express an interest in or a preference for a 2-year curriculum are given special aptitude tests, and the students are advised on the basis of the results. Students

for the retailing program at the University of Minnesota should rank in the top third of those enrolled in the General College, must have an interest in the field as shown by use of the Strong vocational interest scales, and are expected to possess certain personality traits. Students desiring admission to the curriculum in mortuary science at Wayne University must appear before a member of an admissions committee and receive a recommendation of that committee.

Students and alumni.—A variety of students pursue vocational curricula of college grade, depending upon the type of institution and the curricula available. Five types enroll in the Technical Institute of Purdue University: (1) High-school graduates, 25 years old or older, who have about reached the limit of their progress without further training; (2) employed liberal arts college graduates who need technical training; (3) engineering or technical graduates desiring training in management; (4) students with some college work who desire specialized training; and (5) students who had not graduated from high school. Similar diversity is found in other fields.

The full-time students who pursue vocational curricula of college grade include some who are unable for financial reasons to complete 4-year college curricula, some who are not interested in the 4-year college curricula, some who prefer a shorter curriculum than 4 years in order that they may enter paid employment at an early date; some who desire a "very practical" education rather than one with considerable theory; and some, perhaps a small number, who have not the intellectual capacity to complete the typical 4-year college curricula. The evidence from shattered data indicates that the choice between the shorter curriculum and the longer curriculum is based more upon area of interest than upon level of intellectual capacity.

In many institutions the vocational students are from the respective immediate localities. This is particularly true of the evening schools which offer instruction to employed persons. However, it is known that young people are attracted to work in some centers because they have opportunity there to attend school in the evening. For example, students from outside Atlanta are drawn to that city to work because they can at the same time attend the University System of Georgia Center.[12]

Some institutions also draw students from considerable areas. Thus the Farmingdale New York State Institute of Agriculture enrolls students from other States and from foreign countries. The students at Stephens College come from practically every State and Territory and from a number of foreign countries, only a small per-

[12] Statement of George M. Sparks, Director, to a representative of the U. S. Office of Education.

centage of the students being from Missouri. Likewise at the Rochester Institute of Technology the majority of the students come from the city and the surrounding county, but students also come from all over the United States and some foreign countries. These examples suggest that the demand for these forms of education is widespread.

There is some information available as to the activities of the alumni of a few of the institutions. Three-fourths of the alumni of the State Institute at Farmingdale have engaged in farm work or in related work for which they received training at the Institute. Most of the graduates have remained within the region served by the school, but a small number found their work at some considerable distance.

Studies of graduates of technical institutes indicate that for the most part they hold technical positions.[18] However, many of the graduates achieve positions of importance in industry, and some progress to positions in which the responsibilities and salaries are comparable with those of graduates in engineering.

Financial support.—Financial support for vocational education of college grade is derived mostly from public appropriations, endowment, and student fees. Therefore this form of education is supported about the same way as are other forms in institutions that offer the various types of education. However, there are some exceptions. Sometimes students taking off-campus courses are required to pay higher fees than students on the campus.

Tuition is sometimes free, as at the Farmingdale Institute, where no fees are charged. Students of course pay their living expenses, which run from $335 to $550 a year. Tuition fees range from as little as $30 to $36 a year at Pennsylvania State College for evening instruction to as much as $354 a year for full-time instruction at the Rochester Institute of Technology. At the University of Nebraska the annual tuition fee is about $75, and living and other expenses are about $310. The same tuition charge is made at the University of Minnesota, and living and other expenses come to about $573.

In considering the cost of vocational education of college grade, one should bear in mind the fact that large numbers of men and women obtain this form of training in proprietary schools run for profit. In these schools the fees are necessarily high, since the students pay the full cost of their education plus a profit to the owners of the schools.

To date neither the public, in the form of the State and its municipalities, nor philanthropic individuals and organizations, have supported vocational education of college grade to the same extent that

[18] Mark Ellingson and Leo F. Smith. Technical Institute Graduate's Place in American Industry. In *Technical Education News*, 4: 1, 12, 15, January 1945.

they have supported either general education or vocational education of less than college grade. In general, it is necessary, therefore, for the individual to bear a larger share of the cost of his education if he pursues vocational education on the college level than if he pursues other forms of education, with the possible exception of some types of professional education.

The facts stated above have special significance in relation to the education of Negroes. In normal years fewer than 45,000 Negroes out of a total population of more than 13,000,000 are enrolled in institutions of higher education. Further investments in vocational education of college grade, as well as in general education, would be repaid many times over in the increased economic welfare not only of Negroes but also of the entire populations of the areas within which members of the race are concentrated.

Accreditation.—One of the problems in the field of vocational education of college grade is the accreditation of the work and other measures which give it public recognition. Insofar as this work is done in colleges and universities that are accredited, it has standing in them, although some of these institutions refuse to accept it as credit toward degrees.

It was reported in 1941 that all of the five regional accrediting agencies and two denominational agencies recognized terminal education "as a legitimate function of the junior college in their statements of standards for accrediting these institutions.[14] Such recognition was also found in the standards of 13 of the 28 States in which State agencies had adopted formal sets of standards. The statement was made, however, that consideration of terminal education was far from adequate in existing standards. More recently a report has suggested that "the strict accreditation practices and narrow interpretations of courses as practiced by the universities and the accrediting agencies have restricted the development of terminal courses." [15]

The American Association of Junior Colleges has a committee at work to define standards for accrediting curricula and institutions training for intermediate vocations. The proprietary schools have organized councils for the purpose of accrediting these schools.

In the field of technology the Engineers' Council for Professional Development has recently taken steps to accredit curricula of the technical institute type.[16] The basis for accreditation has been adopted, and a committee has been appointed to do the accrediting.

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[14] Walter C. Eells *and others.* Present Status of Junior College Terminal Education. Washington, D. C., American Association of Junior Colleges, 1941. p. 37.

[15] Coleman R. Griffith and Hortense Blackstone. The Junior College in Illinois. Urbana, Ill., University of Illinois Press, 1945. p. 168.

[16] Engineers' Council for Professional Development, Twelfth Annual Report for the Year ending September 30, 1944. New York, The Council, 1944. p. 9–11.

In December 1945 the first inspection was made. The avowed purpose of these activities is to lend the support and prestige of the national engineering societies to the strengthening and development of technological curricula of technical institute type.

A license is required in some States for the practice of certain vocations which fall within the group covered by this report. Among these are dental hygienists, morticians, and cosmetologists. In all probability licensure will be extended to other fields. How widespread it is at present has not been ascertained.

PLANNING THE PROGRAMS

Planning programs of vocational education of college grade is done on the local and institutional level and on the State level.

Local and institutional planning.—A practice which has come into favor in communities that establish and operate terminal junior college programs is to make a survey or a study of the community as a basis for planning.[17] Efforts are made to learn the types of work for which young people should be prepared, the kind of training that should be given, and the extent of the demand for various forms of training. With such information it is possible to outline educational programs that correspond closely to need.

Several examples are suggestive. In formulating the curriculum at the Rochester Institute of Technology, a survey was made of occupations in western New York. After finding the areas in which trained young people were needed and in which there were suitable opportunities for advancement, the jobs were studied and arranged in job charts to show the relationship between constellations or related families of jobs. The activities carried on in the performance of the jobs were then analyzed and assigned to the courses of study. In this way programs were outlined to apply to whole areas of jobs rather than to particular jobs.

Another outstanding example of institutional planning is found at Stephens College, which since 1920 has studied the activities, interests, and instructional needs of women in order to decide upon the fields in which to offer programs. These studies have been the basis for a unique form of organization of the fields of instruction and activity.

State planning.—Planning on the State level has been carried on for a long time. The outstanding illustration until recently has been in California where there has been an extensive development of junior colleges which has been fostered by the State. As a result the State is now well served by 48 public junior colleges. A study

[17] Bliss. Op. cit., p. 126.

in 1939 reported that 46 percent of the enrollment in 35 of these colleges was in vocational curricula of college grade.[18]

Recently an extensive study has been made of the junior college movement in Illinois looking to its development and guidance. The terminal function received much emphasis in the report, which stated that if the junior college in Illinois is to meet its full opportunities, it must provide terminal education on a broad scale throughout the State for all who can profit thereby.[19]

For some years New York State has operated a group of six agricultural and technical institutes and a State maritime academy. Recently the Board of Regents of the University of the State of New York has proposed a plan for expanding the existing technical institutes and establishing a number of new ones. In the spring of 1945 the legislature provided for the appointment of a special commission to determine the need for institutes and to authorize the acceptance of sites and the establishment of institutes.[20] The sum of $250,000 was appropriated to finance studies and investigations.

National planning.—One of the outstanding instances of comprehensive and successful planning of an educational program at the college level is afforded by the ESMWT program, which has been previously mentioned. This program was established to supplement the output of the regular college curricula in engineering, chemistry, physics, and production supervision with short, intensive, college-level courses designed to prepare trainees to perform specific industrial jobs.

The need for such training was established by surveys of the needs of Federal agencies and industrial plants as indicated by defense production authorized and contemplated, and of the numbers of engineers, chemists, physicists, and production supervisors needed and available. These surveys were carried on throughout the life of the program, by single institutions, by groups of institutions in contiguous states, and on a national basis by the Washington staff. Training needs discovered in one region which could not be met by institutions in that region were reported to other regions, and were in most cases satisfactorily met.

Special courses were designed by the institutions, subject to approval by the Director in Washington, to meet the requirements of the jobs to be filled. A number of "standard course outlines" were prepared by the Washington staff to serve as suggestions to institutions in preparing courses to meet needs which could be seen nationally. Institutions were expected to modify them to fit local conditions, and did so.

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[18] Bells. Op. cit., p. 36.

[19] Technical Education News, 4:10, June 1945.

[20] Gibbs and Blackstone. Op. cit., p. 169.

A high degree of interinstitutional cooperation was developed in the conduct of this program. Courses developed by one institution which proved especially successful in meeting particular training needs were made available to all participating institutions. Solutions for difficult problems encountered in uncovering training needs, finding suitable staff members, and establishing suitable administrative and supervisory procedures, were passed on from one institution to others, resulting in definite benefits to the program as a whole and its contribution to the war effort. In some cases teachers were loaned by one institution to teach courses conducted by another institution.

These procedures resulted in a decentralized program, composed of a large number of local programs designed to meet local needs and conducted by local institutions, all operated and administered under a uniform code of generad policies but under widely different local conditions.

CONCLUSION

In no field of educational service is preliminary planning more essential than in this one, which in some respects is quite new and not generally well understood. In order to assure success with vocational education of college grade the curriculum must be closely related to the jobs and positions for which preparation is given. Moreover, outlets must be found for the persons who complete the training. At the same time, the planning should take into account the need for broadening the cultural and social horizon of the students.

In no other instructional field is change more rapid than in vocational terminal education. Curriculum construction therefore must be flexible in outlook and administration to meet changing economic and employment needs. "Follow-through" as well as preliminary curriculum planning is essential.

Chapter IV. A LOOK AHEAD

THE PURPOSE of this chapter is to draw attention to certain problems which must be met and solved by educational leadership in the further development of vocational education of college grade. It is not a summary of earlier chapters but presupposes an understanding of them.

In earlier chapters of this report it has been shown how the growth and increasing complexity of our economic establishment have advanced the levels of skill and knowledge required in numerous occupations, and have indeed created whole new families of occupations. The greater and greater application of science in our modern economic system has concomitantly increased the proportion of "know-why" which each worker must receive in his occupational training, without diminishing the amount of "know-how" which must be achieved. It is not possible to define precisely the level at which the required "know-why" can best be achieved by a vocational education program of college grade, since the operations in most fields extend in an unbroken series from the unskilled through the semi-skilled, the skilled; the technical, the managerial, and the professional.

It is clear, of course, that profesional training, which requires a predominant proportion of "know-why," belongs in the university, while skilled trade training, which requires a predominant proportion of "know-how," may be done in the high school. It is also clear that a considerable number of occupations, requiring a large measure of "know-why," cannot well be prepared for in high school, but at the same time do not demand full-length professional training. This number is rapidly increasing because of the growth of science, technology, and art. Whether in agriculture, in industry, in business, in community services, or in the home, the jobs to be done make increasing demands upon the maturity, intelligence, and skill of the workers. Training programs based increasingly upon science, mathematics, and art, and calling for maturity and general education beyond that of the high school are therefore required.

Furthermore, it has been shown that in recent decades the trend has been toward the completion of high school by greatly increased numbers of the youth population. In the last years prior to the late war more than one-half of the young persons of high-school graduation age were annually graduating from high school. The result has been to increase greatly the numbers of those pressing for entrance into college. A further result has been the tendency toward the postponement of vocational education until after high-school graduation.

College-grade institutions of both general and vocational types are thereby affected. These college-grade institutions are more and more being called upon to train for the highly skilled occupations as well as for the intermediate vocations. Whatever the program undertaken, the greater maturity of the students and their more advanced educational status make possible a more exacting program of training in the college than is feasible in the high school.

The gradual movement of much of vocational education toward the post-high-school level is a part of the process of the upgrading of the general educational attainments of the population which has been going on for more than two generations. As the level of education of all people advances the minimum educational attainment for successful competition also advances. This factor, coupled with the increased amounts of science and other basic knowledge now required in many occupations, has steadily pushed the various levels of occupational training upward in the educational scale. Fifty years ago high-school graduation qualified for entrance into medical school, whereas today three years of college are generally required. Pharmacy has within the past 25 years moved to the level of a full-length college program. Numerous occupations, such as nursing, medical technician, dental technician, medical secretary, and the like, have become college-grade vocational programs of less than degree length.

Fifteen of the most important problems which it is believed that educational leaders will have to face in the development and expansion of vocational education of college grade have been selected for presentation here. It is not pretended that these are all the problems which will have to be faced. Moreover, the discussion here does not aim to be exhaustive nor to propose categorical solutions. Rather it is felt that officials of higher education institutions, and other leaders in higher education will wish to give consideration to the solution of these and other problems in the light of the needs of the people whom they serve and the capacity of their institutions.

How can higher institutions best develop programs of vocational education of college grade?

In the past the colleges and universities have conceived their mission to be education for the professions and liberal education for highly selected secondary-school graduates. In the years immediately prior to 1942 while more than one-half of those persons 17 years of age were graduating from the secondary schools only one-sixth of these young people found their way into college and only two-fifths of those entering could expect to graduate four years later. This suggests that present-day college programs predicated upon selective admission practices are inadequate to serve the needs of the large number of youth now completing the secondary school and desiring

further training. If the colleges and universities are to meet the needs of the increased numbers of youth who complete the secondary school and who secure their occupational preparation afterward, college-grade vocational programs of varying length must be planned and offered. In so doing, higher institutions will not, of course, need to compromise their programs of education for the professions, for the students desiring the more extended programs, and for the furtherance of research.

Higher institutions entering the field of vocational education may find it necessary to make some fundamental adaptations of the curricula and courses taught, and also to make certain changes in their administrative organization. They will need to select essential and functional material from longer curricula and to reorganize it into the shorter curricula, and also to introduce entirely new materials into these shorter curricula. Many institutions will find it necessary to modify or adapt admissions requirements in some of their administrative units such as junior extension divisions in order not only to avoid selection hurdles that are arbitrary and meaningless for such units, but also to assure the admission of students qualified for successful work in the specialized fields offered.

How can greater public and professional recognition of such education be achieved?

Through the leadership of professional associations, accrediting groups, official licensing bodies, and the like, the degrees and other types of recognition granted in the fields of professional education have achieved a more or less standard acceptance throughout the country. Similar general acceptance has come to trade training through the efforts of interested public and private educational agencies, labor unions, and the like. Less than degree-length vocational education of college grade has not yet achieved the same general acceptance, although many groups are seeking to establish standard programs in the field.

Approval of the establishment of new units by recognized State agencies, strengthening of accrediting practices, continued encouragement of the growth of voluntary associations devoted to the upbuilding of ethical practices, and wider dissemination of information concerning the offerings and services of qualified institutions are all needed to bring about the public recognition required to safeguard the quality and good repute of these newer forms of higher education. The several States and occupational group organizations have a distinct obligation to develop sound and effective certification procedures and requirements in the field of vocational education of college grade.

How can an adequate philosophy of work be established for students?

The students and graduates of higher institutions have for long been thought of almost wholly as candidates for the professions and for the so-called "white-collar" administrative and managerial positions. Indications are that the ability of our economy to absorb professional and "white-collar" workers cannot keep pace with the occupational desires of the rapidly increasing numbers who seek to enter and will enter the colleges and universities. Colleges and employers should seek to find ways to impress upon the many students who should not elect the professions or "white-collar" occupations the fact that the intermediate occupations which can be prepared for in college-grade vocational programs offer honorable, personally satisfying, and socially worth-while life careers.

How can planning best take into account national, State, and local needs and factors?

The economy of today is highly complicated and its parts are closely interdependent. New processes and techniques are constantly springing up, while at the same time others become obsolete. Whole new industries come into being, often forcing others out of existence, as for example in the displacement of the horse by the automobile as the principal means of private transportation. Each of such changes brings about a profound transformation in the types of trained persons needed. Since the physical facilities required by vocational education of college grade are necessarily elaborate and expensive, they require capital outlay for long-term projects. It is therefore necessary that national normative data concerning training and employment enter as an important factor into the planning of vocational education of college grade. The Federal Government through its educational agency, the U.S. Office of Education, in cooperation with other agencies such as the Bureau of Labor Statistics and United States Employment Service, should be expected to meet this responsibility. Our working force is now highly mobile; our economic changes are rapid and extensive, bringing about quickly changing training and employment conditions. Only through carefully articulated planning at all levels can vocational education of college grade be properly developed.

How can curricula provide competence in specific tasks without being narrowly conceived?

Vocational education of college grade must assume as its primary responsibility the training of individuals for competence in specific tasks. Such training must, in addition to producing competence in the specific skills required, include effective training in the applica-

tion of ideas, in dealing with people, and in securing a broad view of social as well as individual needs. A foreman of a machine shop or a medical technician, for example, should know a certain amount of economics, psychology, political science, history, geography, literature, or fine arts. Such training will enable the individual not only to carry on his vocation better but also to live a more satisfying life and to be a more effective contributing citizen. While the primary purpose of offering effective preparation for immediate employment must be achieved, no opportunity should be lost to relate such instruction to other subject-matter fields whenever other educational outcomes, such as better citizenship, good health, more effective homemaking abilities, and the like, can be realized.

How can greater equalization of opportunity for students to enter vocational programs be achieved?

There are huge gaps in the provision of vocational education of college grade not only geographically among regions, States, and local communities, but also in the preparation for different vocations in given communities. The welfare of tens of thousands of young people, of vast numbers of adults, and of the Nation as a whole, would be materially advanced if these gaps could be filled and more of the inequities in the provision of vocational education to all who genuinely need and desire it could be removed. In the equalization of opportunities for vocational education of college grade, no group should be neglected. The specific needs of special groups should be given every consideration; for example, the needs of war veterans, displaced war workers, minority groups, rural youth, women students, and others who may have special needs in given communities. The planning for such programs should safeguard against any restriction upon individual opportunity, based upon economic status of a region, race, religion, or sex.

Programs should be based on continuing analysis of the demands for workers in the major occupational fields for which preparation is offered

Studies should be made on a continuing basis of the need for workers and the findings disseminated to every college-grade vocational institution in order, as far as possible, to avoid future conditions of unemployment, on the one hand, and lack of qualified workers on the other. Studies of employment conditions in the State or local area served by given institutions or programs are essential to planning new curricula and courses. Employers in the area should be asked not only for advice concerning future needs for workers, but also for cooperation in the employment of graduates trained in accordance with their advice.

In the case of certain vocations, especially those in which workers are concentrated in relatively few centers, analyses of employment needs should also be made on a national scale. Many States have large reservoirs of workers, but relatively few industrial establishments.

How can such education best be coordinated with other vocational programs?

Since occupations form a continuous series from the unskilled to the professional the institutions providing training must be closely coordinated. The program of vocational education operated under the Smith-Hughes and George-Deen Acts was set up to provide mainly skilled operatives. It carries on under the limitation of being of "less than college grade." The essential feature of its administrative machinery is a State board to be created or designated in each State with authority to administer the program. It utilizes local schools, paying a part of the salaries of vocational teachers from Federal funds.

At the other end of the scale are the professional schools, engineering, medicine, and the like. These are either independent institutions or are parts of comprehensive universities. In any case the professional schools are seldom closely related to the vocational schools subsidized by Federal funds. The programs carried on by the professional schools are in theory completely under institutional control. In practice, however, the institutions bring their programs into conformity with standards and requirements set up by Nation-wide accrediting agencies. The medical schools, for example, look to the Council on Medical Education and Hospitals of the American Medical Association for approval of their programs. The engineering schools look to the Engineers' Council for Professional Development.

Naturally the physician is deeply concerned with the work of the laboratory technician who carries on operations vital to diagnosis and prescription. The engineer is likewise interested in the work of the supervisor of production, the draftsman and the inspector in the plant, or even the operator of the machine which the engineer designs. Up to the present time, however, there has been no adequate means to establish coordination among the several vocational and professional programs. Certain beginnings have been undertaken. The Engineers' Council for Professional Development has set up machinery to accredit curricula of technical institute type when requested by the institution to review them. Medical schools are tending to determine requirements for training medical technicians through a comparable device of approval. Every effort must be made to bring college-grade training for the intermediate vocations into close coordination with other vocational training and with professional training.

How can such education best be related to the total educational program?

It has been pointed out above that proper coordination has not been established among the several levels of vocational education. It is equally true that vocational education at the several levels has not become properly related to other aspects of education, to the end that there may be a correct balance between cultural and vocational education for individuals.

There is widespread absence of coordination among the several units of the systems of education in the respective States. Elementary schools and high schools are commonly under one jurisdiction, and colleges and universities under another or several. Junior colleges and technical institutes are sometimes under the same jurisdiction as the high schools, sometimes under the same jurisdiction as the colleges and universities, and sometimes independent of both groups. The growth of these intermediate institutions between high school and the professional school emphasizes the need for reviewing the nature of educational control at the State level. College-grade vocational education cannot be a purely local enterprise. It must be planned on at least a State basis in coordination with other types of education, so that unification which does not restrict desirable freedom of action is attained.

How can adequate sources of support be found?

In contrast to education for the professions on the one hand, and to vocational education of less than college grade on the other, vocational education of college grade, as a whole, is at the present time without an adequate basis of financial stimulus and support. Since 1862 education for leadership in industrial and agricultural pursuits has had the stimulus and support of the considerable Federal appropriations under the Morrill and subsequent supplementary acts. Since 1917 vocational education of less than college grade has had the support of funds appropriated by the Smith-Hughes and subsequent acts. Both these movements have coincided with and played an essential part in the tremendous broadening and deepening of the capacity of schools and colleges to meet the educational needs of the American people.

Vocational education of college grade is carried on in some cases by private or public colleges and universities, in some cases by technical institutes and junior colleges, in some cases by proprietary schools, and in some cases by extended forms of secondary education. These sources of support have certain limitations. Colleges and universities have many other educational demands on their limited funds. Technical institutes and junior colleges must compete for support with other types of institutions. Many local public school systems

even with assistance from the State are not financially able to suppo the relatively expensive vocational program of college grade. I each case the student pays the difference. A considerable proportio of vocational education of college grade is carried on by private in stitutions operating for profit, which must perforce charge the entir cost of education to the student.

Data in this report indicate that the stimulation and support o vocational education of less than degree length is equally as essentia today as the stimulation of college-grade agriculture and mechani arts was in 1862, or that of vocational education of less than colleg grade in 1917. Stimulation of vocational education of college grad can come, among other ways, from adaptations of the two presen programs, or from the passage of additional Federal legislation, o from other sources. Educators are under obligation to give carefu review to the various means which can contribute to the solution o the problem.

How can such education be brought within the reach of all financially?

Because of the inadequate public provisions for vocational educa tion of college grade, students who seek preparation in the inter mediate vocations perhaps pay a larger share of the cost of their education than any other group of students at the college level. Not only are tuition and other fees and charges higher on the average than in other college curricula, excepting medicine and a few other graduate professional fields, but there is a great dearth of funds for scholarships and other types of student aid. To these handicaps must be added the fact that many kinds of vocational education of college grade are not widely offered, thereby imposing an additional burden upon individuals who seek such training. It will not be possible for vocational education of college grade to render the full measure of service to youth of the country until costs to the individual student are brought down to a much lower level.

How can provision be made for caring for the educational needs of individuals who complete vocational curricula of college grade?

Because of the relatively brief time in which they are offered, vo cational curricula of college grade should not be thought of as truly "terminal," except in the sense of fitting for immediate employment. It is necessary that graduates of these curricula be imbued with the attitude that their schooling is by no means complete when they secure a certificate. In addition to the almost limitless means for self-education, they need additional evening, extension, and short intensive courses from time to time to keep them abreast of the rapid changes in the fields in which they have specialized; to keep them in touch with other subject-matter fields and activities related to their

specialties, and intended to broaden their knowledge of civic affairs; to give them opportunities to share in the richer intellectual and cultural life enjoyed by workers who have secured a more extensive initial education of a general nature; and, in some cases, to enable them to continue their college work on to the degree level.

How can the imperative need for proper guidance for the individual student best be met?

Vocational education of college grade trains for specific occupations embodying definite techniques and procedures. The amount of general and theoretical training included is, of course, greater than in trade training, but is less than is usually given in full degree-length programs. This means that the individual who completes such a program has somewhat less adaptability than if he completes a more general program. It is therefore essential that the trainee's aptitudes and personal qualities be such as to assure a reasonable chance of success in his chosen field. An adequate guidance program which will assist the individual to measure his own qualifications against the requirements of the field of work which is chosen is imperative. Local industrialists might well be asked to assist in the selection of trainees and in the maintenance of current information concerning requirements for the various fields of work.

How can teachers having the special qualifications necessary for success under the particular conditions obtaining be secured?

In vocational instruction the primary emphasis is upon mastery of the use of knowledge in practical working situations, and not upon knowledge for its own sake. Hence, qualifications especially needed of instructors in such programs include successful and extended work experience, a liking for, and an ability to establish successful working relations with students, sound training in the special occupations or fields taught, and related qualifications. The highly specialized training commonly required for the doctorate, research ability, long experience in teaching college classes, and scholarly tastes do not alone qualify a teacher for successful work with young people whose primary interest is in securing a job and making good in it.

Colleges and universities and other institutions which educate teachers must undertake to provide programs which will produce qualified teachers for vocational programs of college grade. This will require the adaptation of present graduate school programs which prepare college teachers, or of the federally subsidized programs for the preparation of teachers for vocational programs of less than college grade, or by the development of a new type of teacher-education program. In any case, these adaptations must be

based upon special analysis of the needs of vocational programs of college grade and geared to their particular organizational framework. An especial need is for teachers who can select, organize, and construct textual and other instructional materials suitable for work of technical institute and related types. Regular college texts alone are far from adequate.

How can such education best aid war veterans and war workers in the immediate postwar period?

Many war veterans and former war workers want and need an unhampered opportunity to attend full-time as well as part-time intensive courses or curricula which will enrich their lives and fit them for better employment. These programs must be provided in institutions predominantly adult in spirit. The institution best fitted to provide vocational education for veterans and former war workers partakes more of the nature of a college than of a high school, especially a high school which does not have an adult education program. Colleges and technical institutes will have to make adjustments before they will be prepared to serve these groups, but these adjustments appear to be simpler and more likely of accomplishment than the adjustments which the typical high schools would have to make.

It would seem to be sound practice, therefore, for the States to meet the needs of veterans and former war workers through adjustments in their colleges, especially junior divisions, junior colleges, and technical institutes, as well as by adjustments in their high schools. Moreover, the adjustments required to enable the colleges in a State to meet the postwar needs of veterans and former war workers will help to forward the development of vocational programs of college grade to meet long-term needs.

Vocational education of college grade is confronted with many problems which its leaders must solve before it can reach the highest level of ability to serve the youth of America. Vision and imagination as well as strong and energetic action are called for in order to insure full development of the program. Furthermore, vocational education of college grade must find its place in cooperation with all other forms of education and must develop in coordination with them. This look ahead has been limited to the salient problems before the educational leaderships of the program. Many more will come to the mind of thoughtful readers to the end that the best planning and most serious consideration will be given to the further development of vocational programs of college grade.

Part II

REPRESENTATIVE EDUCATIONAL PROGRAMS

Chapter V. TECHNICAL INSTITUTE AND JUNIOR COLLEGE VOCATIONAL PROGRAMS

CHAPTERS V AND VI describe briefly 18 programs of vocational education of college grade. In selecting the institutions the total number of each type in the Nation was not taken into account except in a general way. No attempt was made to evaluate them on a comparative basis. Obviously many, if not most, of the outstanding institutions of the country cannot even be mentioned in this place. Nevertheless, it is believed that the descriptions cover must of the significant features of this educational field.

Of the institutions whose programs are described, 9 were visited by members of the Division of Higher Education. Each account was written or checked by officers of the 18 schools and colleges.

The 18 programs are roughly grouped for purposes of discussion under two categories. As elsewhere indicated, given institutions in the terminal vocational field may be classified with equal logic under either of the categories.

1. Technical institute and junior college vocational programs.
   - New York State Technical Institutes.
   - North Dakota State School of Science.
   - Rochester Institute of Technology.
   - Technical Instiute of Purdue University.
   - Tuskegee Institute.
   - Maine Maritime Academy.
   - Northeast Junior College of Louisiana State University.
   - Los Angeles City College.
   - Stephens College.
2. Terminal vocational programs in colleges and universities.
   - Wayne University
   - University System of Georgia Center.
   - Western Michigan College of Education.
   - Cleveland College, Western Reserve University.
   - Indiana University Extension Program.
   - Pennsylvania State College Extension Program.
   - University of Minnesota.
   - University of Nebraska.

NEW YORK STATE TECHNICAL INSTITUTES

New York State maintains seven agricultural and technical institutes, which are located at Alfred, Canton, Delhi, Morrisville, Farmingdale (Long Island), Cobleskill, and Fort Schuyler, the last named being the New York State Maritime Academy.

General State Plan.—The purposes and offerings of the institutes vary somewhat with the several regions they serve. In general, the institutes assist in meeting the increased demands for education be-

yond high school by young people not primarily interested in completing a college education, and in meeting the special educational needs of adults. They give instruction in agriculture and homemaking as well as in the various technologies. The Maritime Academy trains men for the Merchant Marine.

The fields in which instruction is offered by one or more of the institutes include: Agriculture in many branches, ranging from ornamental horticulture to rural engineering; home economics, both for homemakers and for wage earners in numerous specialized occupations such as institutional management and dietetics; technical and industrial courses in such subjects as automechanics, electrical work, refrigeration, and aircraft instruments; practical nursing; building construction; secretarial and commercial work; and numerous others. In addition to regular instruction work, extension services, test services, and the like, are rendered in considerable variety.

Although the admisison and graduation requirements of the institutes vary somewhat, there is a general collegiate pattern discernible in the requirements for most curricula. High-school graduation is usually required for admission, although special students with less preparation who are mature or have suitable experience are often admitted to work in short curricula and courses and to special work of various kinds. Evidence of good health and character are required. Most curricula are 2 years in length, and their completion yields 60 or more hours of credit.

To illustrate the work of technical institutes having training in agriculture as a primary service, the work of the New York State Institute of Agriculture at Farmingdale, Long Island, is described.

General purposes of the instruction at Farmingdale.—Instruction at Farmingdale applies the general philosophy of technical institute work to the specific field of agriculture and farm life. The variety and nature of the Institute's 2-year curricula, of its short and evening courses, and of its community services, indicate that progress in agricultural instruction of the technical institute type has been no less marked than in the various manufacturing and communication technologies. The school operates in the firm belief that education, if properly adapted and applied, has as much value in agriculture as in any other field, and that well-balanced agricultural instruction has a rich contribution to make in the development of the personal and social life of the individual.

Curricula and general nature of the work.—Although it is "a public service institution in the field of country life," the school meets fully the definition of a technical institute. It normally enrolls about 350 full-time students, including some young women. It offers at least eight 2-year terminal curricula in: General agriculture, animal husbandry, dairy industry, fruit growing, vegetable growing, poultry

husbandry, rural engineering, and agricultural business. The Institute also offers three 2-year curricula in ornamental horticulture—in nursery, floriculture, and landscape planning and construction. Through choice of elective subjects, combinations differing from those listed are permitted.

In addition to the foregoing curricula, the Institute normally offers the following short 8-week courses during the fall and spring: General farming, dairy husbandry, horticulture, and poultry husbandry. All of the departments of the Institute offer joint instruction in about a dozen evening courses for mature men and women. More than 600 students were enrolled in these courses in 1944–45.

The scope of the community services rendered by the Institute is quite broad. In 1942–43, when conditions were more nearly normal than at present, some 2,202 persons attended conferences held by the Institute; 494 attended public demonstrations; and 8,142 attended public lectures. Staff members who served in extension classes traveled more than 12,500 miles in the performance of their work last year.

The Institute emphasizes instruction in the practical or applied phases of the specialized vocations within agriculture, but at the same time endeavors to give a foundation of principles and of science to its work. During the first year, the student devotes his time to basic studies in general agriculture. The class and laboratory work is done chiefly from October to April. Instruction continues throughout the year, however. During the following summer semester the student participates, under the supervision of his regular classroom instructors, in all of the operations that are in season, and begins his studies in his chosen specialty. During the second year, the student concentrates in his major field. The instructional groups and classes are small, and the students profit by much individual attention.

Vocational destination of graduates.—The Institute has studied the vocational destination of its graduates with care. Over a long period, three-fourths of its alumni have engaged in farm work, or in other employment in fields related to agriculture, for which they received training at the Institute. Three-fifths of the graduates who engaged in agriculture are engaged in basic agricultural production as employees, managers, or owners of farms, and in handling dairy products. The others are employed in related fields such as in sales, service, testing for dairy herd improvement associations, and similar occupations.

The geographical area of service of the Institute, which is located within less than an hour's commuting time from the heart of the great metropolitan area of New York City, is denoted by the location of the graduates of the Institute who are employed in agriculture and related occupations: Long Island, 27.5 percent; Metropolitan area, 23.6 percent; New York State, other than foregoing, 21.4 per-

cent. The remainder, with the exception of 2.5 percent from other countries, are located in New Jersey, Connecticut, Pennsylvania, and other States.

Foundation courses and specialization.—The courses listed for October to April of the first year are required in all curricula, and for students in agriculture. Thus contacts are provided in all fields, enabling the student to choose a specialty intelligently. A foundation of work is likewise provided for the specialty he chooses. The courses given in agriculture during the first and second semesters are as follows:

Course	Total Credit hours
Agricultural chemistry	4
American life and institutions	1
Bacteriology I	2
Biological science	3
Economic and social adjustments I and II	4½
Farm shop I	2½
Field crop production	2½
Oral and written communication	2½
Personal and community health	2
Plant protection I	2
Soil technology	2
(One afternoon each week required in Farm practice, for 2 semesters. Routine chore assignments, known as barn duty, are required of all first-year students.)	
Total	28

After completing the first 2 semesters, the student chooses his major and specialization begins during the summer semester which follows. The dairy industry curriculum is an appropriate illustration of such specialization, inasmuch as the production of livestock and livestock products is the leading agricultural enterprise of New York State. During the first summer, the specialized courses include dairy bacteriology, dairy laboratory practice, dairy testing, and an elective course, each of which yields 1½ hours of credit. A continuation of the courses in economic and social adjustments and oral and written communication, each yielding 1 hour of credit, completes the 8 credit-hours earned in a summer's work in the dairy industry curriculum.

During the second year of specialized work in dairy industry, 28 credit hours are earned in American life and institutions, accounting, dairy equipment and installation, manufacturing and testing, household and farmstead engineering, market milk, personal and community health, refrigeration and machinery for dairy plants, and electives.

At the close of his senior year, with the guidance of the institution the student secures employment for a minimum period of 6 months in an approved and paid farm job or some other employment related

to his training. His employment is subject to Institute inspection, and he prepares studies and reports concerning it for submission to the institution.

Entrance and graduation requirements.—Entrance requirements include 4 years of high-school work, a minimum age of 16 years, good character, and good health. The student is expected to enter, if possible, by submitting 16 high-school units, including 8 in English, science, and mathematics. Other students who can offer 16 units are considered for entrance upon their merits.

For graduation, 60 or more units of credit are required, to be taken during 5 semesters. No failures are permitted in the subjects required in the student's chosen curriculum, or in required first-year subjects. Satisfactory achievement in barn duty, field work, and placement training is also required. A diploma is awarded graduates.

Costs to students.—Tuition is free to State residents. The expenses for students living at the institution will approximate $550 during the first year; during the second year, closing in April, about $335.

Plant and facilities.—Plant and facilities appropriate to the work of the Institute are provided. The campus and farm at Farmingdale comprise 345 acres, and another farm in Dutchess County, some 90 miles away by bus, covers some 750 acres. Instructional buildings are substantially constructed, and shops and laboratories appropriate to the work are provided. The Institute library includes 8,000 volumes, chiefly but not exclusively technical in nature, thousands of bulletins, and other publications.

Teaching Staff.—The soundness and good quality of the Institute's work in agriculture, although demonstrated in its curricula, plant, and equipment, is nowhere better shown than in the preparation and experience of its instructional staff members. The staff members almost without exception have received extended preparation appropriate to their specialties in agricultural and technological colleges of high standing; and the great majority of them have had wide and successful work experience in their chosen fields. Such preparation and experience have gone far toward developing sincerity and enthusiasm in instruction. Largely by virtue of its possession of such a staff, the Institute has been able to earn a well-deserved reputation as an institution that not only teaches farming but also creates farmers.

NORTH DAKOTA STATE SCHOOL OF SCIENCE, WAHPETON, N. D.

At the North Dakota State School of Science students may pursue standard trade curricula or combined college-trade curricula. The two types of curricula are differentiated on the basis of content rather than student qualifications. The combined college-trade curricula are described in this report.

Purpose and plan.—The North Dakota State Constitution adopted

in 1889 provided for "a scientific school at Wahpeton." Although no curriculum was described, the evident intent was to establish a school of higher education which should concentrate its activity on the skilled trades with direct vocational purposes. When the school was established in 1903, the entrance age limit was set at 16 and the school was empowered to offer junior college work as far as necessary to effective vocational training. In the legislative act of 1903 the chief purpose was defined as "the training of skilled workmen in the most practical phases of applied science" and there was also provision for "such instruction in the pure and applied sciences, mathematics, languages, political sciences and history as is usually given in schools of technology below the junior year." From the start the chief appeal was to high-school graduates, and, though there was no specific requirement as to high-school graduation in departments of trades and business, nearly all of the regular "year-round" students have been high-school graduates. Others by reason of maturity and experience have been able to carry the work.

Although there was some stress on trades education during early years, the actual development was strongest along the well-known lines of junior college and business.

For reasons now generally known trades education took on sharply definitive form in the years between 1917 and 1922. In the latter year Dean Babcock of the University School of Mines made an authorized survey the result of which was to retain the work in business and junior college subjects, to designate the Trades department as "The State Trade School" and to provide for interaction by the three departments. Since that time the functional title has been: "North Dakota State School of Science: Trades, Business, Junior College."

In recent years, 90 percent of the student body have been high-school graduates; and the remaining 10 percent have been mature individuals, many having a background equivalent to that of a high-school education. This means that practically all of the regular student body have been pursuing training on a level beyond high school. The greater percentage, however, elect to pursue the regular trade courses preparing for employment as repairmen and servicemen in the skilled trades. This group is not considered in this report.

About one-third of the student body pursue college grade terminal courses preparing for a vocation, hereinafter referred to as "completion" courses. This report is concerned specifically with this group.

Variety and nature of terminal programs offered.—In addition to a wide variety of vocation trades students, the Junior College, interacting with the Trade School, offers 2-year completion courses in electrical engineering, architectural engineering, aviation engineering, and printing-journalism.

In the Business School, accounting and business administration, stenography (or stenotype) and business administration, and secretarial training are listed as "completion" courses. As in engineering and printing-journalism courses in the Trade School, these function as terminal courses leading directly to employment. Listed as vocational-business courses are stenography and secretarial training, accounting and business practice. The technical processes in these are exactly the same as the technical processes in the courses denoted as "completion." The only difference lies in the relative amount of theoretical work offered.

Later in these outlines, there is described, as a typical completion course, the operation of 2-year electrical engineering. All other completion courses are organized on the same plan. Trade courses, strictly speaking, differ from "completion" only in cutting instruction in theory to a necessary minimum.

Involved in relation to interaction of Junior College, Trades, and Business is a selective process, which may be defined by presenting two examples: (1) A student taking aviation engineering finds that he is ill-adapted to study college mathematics, chemistry, and physics. With consent of advisers, he may transfer from junior college to trades work, which means concentration of all his time and energy to training as an aviation mechanic on a skilled trade level: (2) A junior college student taking the secretarial training completion course, by some reduction of collegiate subjects "transfers" to the Business School. This change is made in cases where the student wants to concentrate attention on the mechanics of business training. This is a lesser change than one from junior college to trades, because, as stated before, all business school students retain a large amount of work on a collegiate level.

Types of occupations for which training is given.—Some of the jobs or occupational families for which the college-trade terminal courses prepare men to work are these: draftsmen; estimators; junior engineering jobs in industry; foremen; maintenance technicians; special equipment technicians; testers; supervisors; superintendents; shop owners and operators; news reporters; and engineering aides of various kinds.

With relation to jobs for which training is given in Junior College interaction with the Business School, it is to be noted that all curricula previously listed deal with accounting, stenography (or stenotype) or a combination of these. As jobs taken often involve a combination it seems better to list these with relation to Business School as a unit.

Among graduates are a bank president and numerous other bank officers, owners and managers of stores and other forms of business, stenographers, secretaries, bookkeepers, accountants, statisticians, salesmen, and clerical and stenographic workers in civil service. The

printing-journalism course in Trade School combines printing and business, and many of its graduates are newspaper owners, editors, and publishers.

By stress on personal qualities, by interaction between departments, and by teaching of such subjects as office methods, the basis is laid not only for getting and holding a job but also for advancement to managerial and executive positions.

Selected curriculum: Electrical engineering, terminal or completion course.—The 2-year combined junior college trade course in electrical work may be taken as an illustration of a selected college grade terminal course that prepares for a vocation. Over the period of 20 years that it has been in successful operation, it has acquired a number of names or titles. By some it is called the 2-year engineering course; by some it is known as the college-trade "completion" course; by others as the two-year college electrical terminal course; and by many in the field of vocational education it might be classified as a vocational-technical course preparing young men for junior engineering jobs in the electrical industry.

The prime objective of the course is to fit young men for positions in the electrical field that are between the skilled trade level and engineering level. This group might be classified as the noncommisisoned officers of industry.

The student in this course devotes about one-half of each day to study of subjects on an engineering level such as: college algebra, trigonometry, strength of materials, college physics, chemistry, technical English and engineering drawing. He devotes the other half day to electrical engineering theory and practical shop work. Class instruction in related theory includes electrical engineering theory and problems, electrical laboratory work, electric machine design and electrical distribution systems. Shops in which these students receive real trade experience are these: signal equipment and wiring; electric controls; electric motor maintenance and repair; direct current machinery; alternating current machinery; meter testing; instrument repair and construction; machine shop; and refrigeration.

This may sound like a very heavy schedule for the first 2 years beyond high school. It is a heavy schedule, and the student is busy in class and shop from 8 a. m. to 4:12 p. m. five days a week. But the fact is that it works; that an average student who applies himself can make the grade; that those in the course with capacity never question the heavy load; and that the students make good grades. Theory courses are of great interest because students see the application when working in school shops.

After 2 years of training the student may go directly to employment in industry because of the practical shop training coupled with necessary theory. The fact is that 9 out of 10 accept employ-

ment rather than continue on with the engineering course. Many get their start as meter testers and repairmen for power companies. A few typical occupations filled by graduates, after some experience out on the job, are: Power plant operators; division managers for power companies; foremen and superintendents of departments within the company; managers of retail departments; operators of own places of busines; junior engineering positions with electrical concerns; foremen and leadmen for electrical contractors.

A special service that such a curriculum gives to young men is this: It provides an opportunity to try out a course of training on an engineering level. The lad who finds, during the first quarter or term or even after the first year, that he does not have the adaptability or capacity to carry the work, can transfer over directly to the electrical trade course, on a skilled trade level, and lose no time or credit. He has had enough shop training and related theory so he can drop in at any month with those students pursuing the 2-year electrical trade course.

Admission and graduation requirements.—For all courses specifically listed as collegiate, a minimum entrance age of 16 is specified, plus a high-school diploma, or evidence of equivalent education. For vocational-terminal or trade courses, the minimum age of 16 is the only stated requirement.

In junior college completion courses, college credit is assigned to all subjects designated in the school catalog as junior college subjects. The same process is applied to shop courses which are organized on a collegiate basis. All other vocational work is recorded in terms of clock hours.

Completion requirements demand finishing of all subjects in a given 2-year curriculum, with due regard to a standard of proficiency. In general there is required an average of "C" or better. In completion courses proficiency has priority over this grade rating; for example, a student might reach the requirement as to grade rating but fail to graduate if he was deficient in subjects most essential to proficiency on the job. From all foregoing statements it will be evident that nearly all the energies of the State School of Science are directed to teaching students to be proficient on the job and to stressing qualities that will lead to advancement on the job.

While the minimum age requirement has meant a strong appeal to high-school graduates, anyone regardless of previous education is admitted if he is evidently capable of profiting by the training given. It often happens that mature, experienced men and women come either to learn new techniques or to broaden their field by kinds of vocational training not included in their previous experience.

ROCHESTER INSTITUTE OF TECHNOLOGY, ROCHESTER, N. Y.

The history of the Rochester Institute of Technology dates from 1829 when the Rochester Athenaeum was organized for the purpose of cultivating and promoting literature, science, and the arts. It was not a formal school, but an institution for bringing to the people of Rochester broad cultural contacts with the outside world through leaders of the country in the fields of literature, science, theology, and education. In 1885, to meet the demands of young men for technical training for work in the rapidly growing industries of the area, and to meet the employment demands of these industries, the Mechanics Institute was founded. Six years later Mechanics Institute consolidated with the Rochester Athenaeum to form the Rochester Athenaeum and Mechanics Institute. On September 1, 1944, the name of this institution was changed to the Rochester Institute of Technology. It is governed by a self-perpetuating board of trustees of 35 members. These men and women are among the leading industrial and civic people in the city.

Objectives.—The Institute, as it functions today, incorporates in its spirit and in its program the traditions of both the Athenaeum and the Mechanics Institute. The purpose of the Athenaeum was to contribute to the living of a rich, well-balanced life; that of the early Institute to contribute to a successful life through practical occupational training. Today the Institute provides general education and technical training for a satisfying life and the earning of a respectable living, not as two processes but as one, closely integrated so that graduates may successfully take their places in the community as contributing citizens.

The two basic objectives of the Institute may be briefly stated as follows: (1) To assist each individual to develop civic and occupational competency; and (2) to render service to the community by giving training in specific areas where competently trained people are needed.

Curriculum construction.—In order to achieve these objectives, three principal techniques have been employed: (1) A curriculum based upon a scientific study of the activities carried on by successful workers in the areas in which the Institute offers training; (2) a program of individualized education centered upon the needs of each student; (3) a cooperative program which enables students to see the application of the theories they have studied in school. In order to understand how each of these operates they will be described somewhat more in detail in the following paragraphs.

In formulating the curriculum, a survey was made of occupations in western New York. This revealed the areas in which there was a need for trained young men and women and in which there were

suitable opportunities for advancement. Following the survey, the jobs for which it seemed desirable to train were arranged in job charts to show the relationship between constellations or related families of jobs. This practice of training for a constellation or cluster of related jobs is a significant feature of curriculum development. It means that a student who completes a course of training at the Institute has a broad background of knowledge and skills applying to a whole area of jobs. For example, a student who trains himself in the mechanical department for the basic job of technical supervisor has a background of training which will help him also toward working up to such positions as tool engineer, chief of testing, machine designer, or field engineer. Once the job constellations had been selected, a thorough analysis was made of the activities carried on in the performance of the jobs involved. These activities were then assigned to the courses of study.

Methods of instruction.—Individualized education at the Institute is planned to help each student develop a well-balanced set of characteristics which will facilitate his individual progress and adjustment. Individualized education is not only a method of instruction, it is a point of view permeating educational philosophy and administration. Through day-by-day instructional services; through a study from manuals based on analyses of duties, skills, and attitudes exhibited by successful workers; through carefully planned observation of each student's needs, interests, and abilities; and through appropriate placement on the cooperative job, the Institute implements its philosophy of individualized education.

The cooperative plan of education at the Institute seeks to relate technical training received in classes, laboratories, studios and shops with actual employment in business and industry. Organized in 1912, the cooperative plan has been in continuous operation at the Institute since that time. The cooperative courses are aranged so that a period of several weeks of school training is followed by a similar period of weeks of practical experience on the cooperative job. At the beginning of the school year employment managers interview and employ students in pairs. One student of each pair works while the second attends classes at the Institute. At the end of each work period the student who has been at school goes to work and the student who has been working begins classes. Cooperative students in the retailing courses work in retail stores where they pass through a series of training positions which prepare them for responsibility in the retail field. Cooperative students enrolled in the mechanical, electrical, or chemistry courses work in industry on jobs dealing with some phase of manufacturing or of engineering. In the food administration course students are employed in food service organizations or as student dietitians in hospitals. During

the school year 1940–41 more than 600 Institute students received cooperative training.

Plant and endowment.—The Institute as it is organized today is a nonprofit-making, privately endowed, educational institution with productive endowment in excess of $3,000,000, and plant and equipment valued at approximately $2,000,000. It occupies more than two full city blocks, utilizing eight buildings for educational and dormitory purposes and is located in the heart of downtown Rochester.

Students.—The majority of Institute students come from Rochester and Monroe County although in certain departments students are enrolled from all over the United States and some foreign countries. During the school year 1940–41, 850 students were enrolled in the day school curricula and approximately 3,500 in the Extension Division. Although high-school graduation is not a prime requisite for entering, less than 1 percent of students who enter are not high-school graduates and approximately 5 percent have had some college training. On the basis of standardized psychological examinations, Institute students are comparable to those entering the average American college or university.

Student Fees.—Student tuition and fees range from $226 to $304, tuition being $50 higher in the full-time than in the cooperative courses. It is worthy of note that students employed on cooperative jobs regularly earn enough to meet a large part or all of their expenses.

Curricula.—At present there are eight departments in the Institute, five of which operate on the cooperative basis and three on a full-time basis. The cooperative curricula are offered in industrial chemistry, electricity, mechanical work, food administration, and retailing. Full-time day curricula include 2-year programs in photographic technology and in publishing and printing, and a 3-year program in applied art.

The techniques which have been utilized in formulating the curricula have already been described in previous paragraphs. The following is the 3-year cooperative program in instrument making which is one of the majors in the Mechanical Department:

Instrument Makers Course

FIRST YEAR

	Hours per week
Mathematics	5
Mechanical drawing	6
Machine shop and instrument making	9
Psychology	3
Mechanics and heat	5
English and study techniques	2
Total	30

Instrument Makers Course—Continued

SECOND YEAR

	Hours per week
Economics	3
Drawing and mechanism	6
Electricity	6
Strength and properties of materials	6
Instrument making	9
Total	30

THIRD YEAR

Optics and sound	3
Tool design	9
Materials laboratory	3
Instrument making	9
Industrial management	3
Technical projects	3
Total	30

Staff.—In any program of technical education the qualifications of the staff members are extremely important. The Institute has paid particular attention to this and factors considered are: Competence in the professional field, educational background, personality, and interest in young people. Competence in the professional field has been listed first for the administration believes that this is of prime importance. College education of the staff members is also important, but this type of background without professional competence is not sufficient in a technical institute. Staff members periodically spend summer vacations in business and industry, serve as consultants on technical problems, and in other ways keep abreast of the new developments in their own fields. The Institute employs 120 people on a full-time basis in the day school and 95 additional on a part-time basis in its Extension Division.

The Institute is committed to the policy of using consulting services, and over a period of years has arranged a regular series of visits from several well-known consultants.

TECHNICAL INSTITUTE OF PURDUE UNIVERSITY, LAFAYETTE, IND.

Purdue University, a land-grant university, carries on a large program of extension work to reach residents of the State in their home communities. The Cooperative Extension Program in Agriculture and Home Economics, administered largely through county agricultural and home demonstration agents, reaches the people in the rural areas. It receives Federal aid in accordance with the Smith-Lever Act and supplementary legislation. The Technical Extension

Division of the University carries on three types of work: (1) Extension courses for credit in degree programs; (2) noncredit offerings; and (3) the technical institute work. This report considers only the work of the technical institute.

The technical institute represents an effort to continue the service which the University rendered on a large scale during the war in the Enginering, Science, and Management War Training Program. Although established on a permanent basis, it is still in the experimental stage, and many problems of operation remain unsolved.

Nature and Purpose.—The technical institute is designed to offer persons in the industrial centers of the State comprehensive technical training of a subprofessional nature in enginering fields. It provides an off-campus educational program to serve the people and industries of the State where there is need for such training, by offering specific instruction beyond the high-school level directed and oriented toward the industries of the localities in which it operates.

The training differs from the enginering-college type of training in that it emphasizes the applied and practical rather than the basic or theoretical phases of the study of engineering. It is available to those who wish to qualify as engineering aides and technicians, such as laboratory supervisors, inspectors, junior draftsmen and designers, laboratory technicians, control instrument experts, specialists in electrical circuits and machinery, and persons charged with responsibilities and skills of a semiengineering character.

Three regional centers are maintained where the instruction is offered: Fort Wayne, Indianapolis, and Hammond (Calumet Region for Gary, East Chicago, Hammond, and Whiting). Several additional centers are under contemplation.

The training offered by the technical institute is a phase of university extension work, but is different from the usual extension work in several ways. First, it is organized in permanent centers off the campus. These centers are in charge of administrative officers who reside there, and they have their own teaching staffs. The determination and organization of the subject matter of instruction for the institute is a responsibility of the institute authorities in the University and the regional centers, and not of the departments of instruction in the University as is usually the case for extension courses. Second, the technical institute provides well-organized curricula for the attainment of definite and specific objectives, leading to certificates.

While in the past the greater part of the work has been carried on in evening classes, the present trend favors an increasingly large number of full-time day students. During the first 2 years' operation, only 6 day courses were given and the classes for these courses were small. In the winter term of 1945 a class of 34 full-time day students enrolled in the Calumet Center. It is expected that classes

of this size and larger will continue to enroll in the Calumet Region with the passing of successive terms. The prospects of full-time day students in the Indianapolis region seems reasonably good, and, as the program continues to develop, the Fort Wayne center and others may likewise enroll day students. Day courses have not been pushed. They are offered whenever there are a sufficient number of students desiring them. It is expected that as conomic conditions change there will be a greater need for day instruction.

The technical institute is maintained "to render a training service to those who can profit by the training." Applicants are admitted who can fulfill one or more of the following requirements: (1) Graduation from an accredited high school; or (2) satisfactory completion of 14 units of high-school work plus the recommendation of the principal of the high school last attended. Those who cannot formally meet these requirements, but who feel that they are qualified to complete the program of study offered are asked to submit applications for admission. Such applications are reviewed by counselors and acted upon by the Director of Technical Institutes at the University.

Students may enter the technical institute with advanced standing, which may be had through passing examinations on courses, credit being given on the courses passed. Only 28 students have requested these examinations, and 15 have passed them.

Curricula and certificates.—The programs of study of the technical institute are intended to produce technical aides in engineering. They cover 3 years of full-time work and lead to certificates, the associate technical aide certificate being given for the completion of 2 years of study and the technical aide certificate for 3 years of work. The typical evening student is able to carry about one-half of a full-time schedule, and he requires about 4 years to obtain the associate technical aide certificate.

The courses are evaluated by the credit-point basis. A credit-point is defined as one hour of classroom or one and one-half hours of laboratory or drafting-room work per week for the 12-week term. These credit-points apply only to technical institute certificates and are not transferable to the university engineering programs; but in certain courses, work may be preparation for establishing college or university credit upon the examination basis.

Three curricula are offered: (1) Drawing and mechanical; (2) electrical; and (3) management. The first year's work consists largely of fundamental courses which are common to all curricula, and the work of the second year is largely in a specialized field. The third-year program is arranged on an individual basis, the student carrying his specialty to a more advanced stage.

Of the 96 credit-points required for the associate technical aide certificate, 48 must be in fundamental courses, as follows:

Mathematics (technical computations)	12
Physics (4 in mechanics, 4 in electricty, 4 in heat)	12
English (4 in industrial terminology, 4 in technical report-writing)	8
Management	8
Chemistry	4
Drawing	4

The remaining 48 credit-points must consist of: (1) Specialized courses in any one of three fields, 34; and (2) functional courses in nontechnical fields, 14.

The offerings in nontechnical courses are: Economics of industry, historical review of American institutions, history of industrial expansion, geography of raw materials, speech, advanced speech, industrial accounting fundamentals, psychology and human relations, principles of industrial psychology, urban sociology, and citizenship. From these courses the student elects those that best suit his purposes.

Although curricula are well organized in sequences, the student is advised but not required to adhere rigidly to them. An educational counselor approves the student's schedule.

Teaching staffs.—The instructional staffs at the centers consist almost entirely of part-time teachers who work in local industries during the day, usually on work that is directly related to the instruction they offer. Many of the teachers gave instruction in the ESMWT program. A few high-school teachers are employed by the institute and a small number of regular faculty members at the University have taught some courses.

The work of the teachers is checked by supervisors to assure good service. The courses are outlined in considerable detail for the teachers to afford a reasonable guarantee that the instruction is in accordance with the objectives of the program and covers the field adequately.

Students.—The greater part of the students falls into five general groups. The most typical student is a high-school graduate who at about 18 or 19 years of age got a job. By 21 he was married and by the time he was 25 years old he had a family of children. He had reached practically the limit of progress without further training. Owing to financial circumstances he was not able to quit his job and enter full-time training. Usually he came to the technical institute to take one course but, acting on advice, he entered an organized program of study.

A second type of student is a graduate of a liberal arts college who has gone into industrial employment and has found that he needs technical training.

The third group—a small but probably continuing number— con-

sists of students who have engineering or technical degrees. They have been elevated to supervisory jobs in industry and find that they need training in management.

A fourth group is made up of those who have had some college work but have not received degrees. They desire instruction in a specialized field.

Students who have not graduated from high school constitute the fifth group. Usually they have had industrial experience, perhaps a considerable amount, and find that technical training is essential to their further progress.

During the 2 years in which the technical institute has been in operation, a total of 509 applicants have been approved for admission, 90 percent of them male and 10 percent female. The average age of the applicants is 30 years.

Of every 100 applicants admitted, 89 were industrially employed, 9 were employed in nonindustrial ocupations, and 2 were unemployed.

Of every 100 applicants admitted, 28 had not graduated from high school and 72 had completed secondary school; of the 72 high-school graduates, 49 had not attended college, 23 had attended college but had not graduated, and 6 had obtained college degrees.

Organization and management of the regional centers.—Each regional center has a full-time staff, one of whom is the regional supervisor and the others are his assistants. The supervisor registers students, collects fees, advises students, and operates the library. His authority is delegated to him by the various campus offices and agencies and his activities and decisions are subject to their review.

Provision has been made for a regional executive council in each center, but to date the only one organized is in the Calumet area. The council, which represents the community, is made up of prominent citizens in education, management, and labor. Its function is to advise on matters of local policy.

Each center has a regional committee on course of study, which consists of engineers and training directors in industry, school vocational directors, and educational representatives of labor. The committee gives advice concerning the development of course material, the formulation of curricula, and the selection of instructors. It acts only in an advisory capacity.

Space for offices, classrooms, and laboratories in the centers is leased by the University. High schools are sometimes used to supplement the space that is leased.

Organization and management at the university.—The technical institute program is largely directed and managed by a central office located on the campus of the University. It is in charge of a director of technical institutes who has subordinates charged with full

responsibility for subject matter preparation and supervision. The administration of the program is carried on by the Technical Extension Division of the university, through its central office and field staff.

For each subject matter field taught in the technical institute there is a faculty advisor—a member of the regular faculty of the University. These faculty members are in reality departmental advisors to the educational advisor in the central office.

The institute program is separate from the University departments and offices with respect to the subject matter of instruction but not with respect to administration. The various service agencies and offices on the campus of the University carry on their respective functions for the technical institute, just as they do for the rest of the University. For example, the collection of fees from students in the institute is a function of the business office, but that office has delegated most of the actual work to the regional supervisors at the centers. Likewise, the library books for the centers are purchased by the University library and are shipped to the regional centers of the institute. The registration of students, the recording of student grades, the provision for plant facilities and equipment are all under the direction and supervision of the regular University offices. Some campus offices have placed representatives in the central institute office to facilitate contact with the regional centers and assist those centers.

The materials of instruction, such as course outlines and laboratory exercises, are worked out on the University campus with the cooperation of the campus faculty advisors and the regional committees on course of study. They are checked with representatives of the industries where the students work or are likely to work. These materials are mimeographed and placed in the hands of the students and teachers at the centers, and they are closely adhered to. In this way, reasonable uniformity of instruction is obtained and standards of work are assured. It overcomes some of the difficulty often experienced by schools in using part-time teachers. About 50 courses have been worked out in detail.

Financial support.—Although the University makes no tuition charge to students who receive instruction on the campus, it charges tuition fees to students in the technical institute. The tuition fee per course varies somewhat from course to course depending upon the complexity of the subject matter and nature of instruction (laboratories, recitation, etc.). All fees are published with course descriptions in the catalog and remain the same regardless of geographical location. The fees paid by students for 2 years of work leading to the associate technical aide certificate amount to approximately $450.

The fees paid by the students are not sufficient to meet the expenses of the technical institute program. For the year 1943–44 they amounted to 26 percent of the expenses, and for 1944–45 to 28 percent, but the expenses included some outlays for equipment. The remainder of the costs is met from State and University funds.

Veterans at the institute.—Some effort has been made to learn from men in the armed forces whether they have much interest in the technical institute type of education. While little in the nature of organized response has been obtained, a few statistics drawn from registration seem significant in this connection. In the first 2 years of operation 509 students enrolled in the technical institute. Of this number, 20 were veterans as follows: Fall term 1944, 2; winter term, 1944, 7; spring term, 1945, 11.

In the fall term of 1945, the upswing in the percentage of the enrollment which consisted of veterans increased greatly. Thirty-eight veterans enrolled in the fall term, an increase in excess of 300 percent over the previous term. The total registration for the same period was 131.5 percent of the previous term. The winter term of 1945 showed an even greater increase when 194 veterans enrolled. Although a similar increase in education of college grade generally has taken place recently, the significance of such an expansion within the technical institute operation cannot be overlooked.

TUSKEGEE INSTITUTE, TUSKEGEE, ALA.

Tuskegee Institute, like most institutions of higher education for Negroes, is called upon to perform a wide variety of services to meet the manifold vocational needs of its students. It maintains schools of agriculture, education, home economics and commercial dietetics, nurse training, and, of primary interest in this report, a school of mechanical industries. The Institute also maintains departments of music and physical education.

School of mechanical industries.—The School of Mechanical Industries enrolls more students in normal years than any other school in the institution, with the exception, in some years or quarters, of home economics. In general, the courses of study which are emphasized most are those whose graduates are in greatest demand in trades, industries, service occupations, agricultural pursuits, and related occupations. Degree curricula in commercial industries and in industrial education, and an individualized plan of study to fit individual objectives, which also leads to a degree, are offered in the School of Mechanical Industries. Of especial interest, however, is the nondegree Vocational Trade Curriculum of 2 years duration, which leads to a diploma. In addition, unclassified instruction leading to a diploma or certificate provides special work in certain phases of trades and industries and of related technical fields in

keeping with the abilities and previous training or experience of the students.

Entrance requirements.—The requirements for entrance to the vocational trade curriculum, are, in general, the same as those of the institution as a whole. Freshman candidates who plan to earn degrees, and students in the terminal vocational trade curriculum, are required to offer 15 high-school units from an accredited high school, if they wish admission by certificate. Eight units are prescribed: English, three; history or social science, two; and mathematics and science, three. Three additional units must be offered from these or closely related academic subjects. Entrance examinations are required of graduates of unaccredited high schools. All students admitted to the school are required to take an intelligence test and placement examinations in mathematics and English. Those students showing unsatisfactory achievement in the placement examinations are required to take noncredit remedial courses to bring their achievement to a satisfactory level in these areas. However, many students of mature age and experience are admitted as unclassified students, and admission requirements do not bar employed persons who wish to advance themselves by taking work for short periods. Students may enter at the beginning of any quarter.

Self-help opportunities.—Many student self-help opportunities are provided, but the demand for them exceeds at all times their availability. Among them are work opportunities in job-classes and a variety of forms of financial aid for needy students, including: self-help scholarships, a 5-year plan of study and labor eventuating in a degree, an interne plan for students in commercial dietetics, and scholarships for students showing ability and promise.

Vocational trade curriculum.—The vocational trade curriculum, like the lower division curricula of the School of Mechanical Industries, is completed in 2 years. These curricula all have certain subjects in common. However, the vocational trade curriculum is a terminal and not a lower division curriculum; its controlling purpose is to prepare students for gainful employment within half the time required to earn a 4-year degree. A minimum of 102 quarter-hour credits are earned during the 2-year course, not including 9 hours in military science and tactics taken by men students. Successful completion of the curriculum yields a trade diploma. A holder of this diploma who wishes to continue his work through the upper division of the school to a B. S. degree may do so without great difficulty by taking the necessary prerequisite lower division subjects.

An unusual element of instructional flexibility is provided in the school's opportunities for "unclassified instruction." Such instruction affords special work in phases of trades and industries, or related

technical areas, in keeping with abilities and previous training or experience. Upon completion of a special program, a certifying statement or certificate is awarded, in keeping with the scope and nature of the program of study.

The general content of the vocational trade curriculum may be summarized briefly, as follows:

FIRST YEAR		SECOND YEAR	
Subject	*Credits*	*Subject*	*Credits*
Industrial major subjects	24	Industrial major subjects	15
Industrial apprentice practice	6	Industrial apprentice practice	24
English	9	General trade lecture	6
Mathematics	9	Forum	3
Human biology (health)	3		
Forum	3		
Total	54	Total	48
Military science and tactics	4½	Military science and tactics	4½

Subjects and courses taught.—The objectives and nature of the subjects offered are, in the words of the institution, "specifically economic rather than generally social." A variety of industrial major subjects are offered, including aero mechanics; automobile maintenance; carpentry; electricity; machine shop and welding; masonry; painting; plumbing and steamfitting; printing; sheet metal and roofing; shoe repairing and leatherwork; and tailoring. Scores of individual courses are offered in these subjects.

The related or service courses in the arts and sciences are strictly functional. In the institution, as a whole, there is no school of arts and sciences and there are very few departments in this field; and these do not isolate or formalize courses, or teach them exclusively for their purely scholastic values. No more is claimed in the descriptions of courses in general mathematics, for example, than that they "teach those topics in elementary mathematics most closely related to life situations." The courses in "Mathematics for Agriculture" are fully as specific as their names implies. Arithmetic is taught, not as a discipline, or as a unit in formal course of study in mathematics, but as "a course for students deficient in arithmetic." Similarly, technical English 101, offered in conjunction with printing, is designed "to give the student in printing a basic knowledge in the technics of English and its relation to correct typographical processes." A representative course in science is thus described: "Integrated science for rural schools. Intensive study of science principles and their application to everyday life problems. The course includes units on . . . how to utilize available local materials for science teaching in rural schools."

Faculty.—The regular faculty in the School of Mechanical Industries consists of 33 members, including 4 now on leave and 2 part-

time teachers. Flight instructors and other personnel in the aviation training program, if added, would almost double the total. In other schools and departments of the institution, a variety of instructors in additional fields are available to students under certain conditions.

The highest degrees held by the 33 faculty members of the School are: Doctor's, 1; master's, 6; and bachelor's, 11. Twelve have diplomas or certificates, chiefly in vocational fields. The preparation of 3 instructors is not specified.

In the especially important qualification of practical experience in technical pursuits essential to faculty members in schools of this type, the faculty members of the school rank very high. Practically all of the teachers have had practical work experience outside of the Institute, some of them for many years. Instructors in the practical courses hold licenses to practice their occupation, issued by the larger cities, States, or Federal Government, where such licenses are customary. Four members hold professional licenses to practice engineering, architecture, or land surveying.

Other work.—Only an illustration of the other work in the institution which merits description can be mentioned here. The work in commercial dietetics has most of the characteristics of subprofessional offerings of college grade. It has been conducted for about 10 years, and parallels the trend in the direction of recognizing the importance of practical vocational training during the years following those spent in high school.

Income.—Tuskegee Institute as a whole is unusually well-endowed and equipped, at least in comparison with most other institutions of its kind. It has total assets amounting to more than $12,000,000, including endowment funds of approximately $7,000,000, and plant and equipment valued at $4,700,000. Its current income in 1943 was more than $1,629,000, including more than half a million dollars from auxiliary enterprises and activities. The current expenses of the School of Mechanical Industries are normally greater than those of any other school in the institution, amounting to $69,331 during the year ending May 31, 1943. Even so, the needs of the institution, in terms of needed college-grade educational services for the Negro race, are very great.

MAINE MARITIME ACADEMY, CASTINE, MAINE

Nautical education is provided in the United States through five State Maritime Academies. Foreign countries have had more schools of this type; before the war Italy had 17, Norway 15, Holland 12, France 11, and Japan 10. It is expected that the demand for this form of education in the United States will increase in the near

future. The Maine State Maritime Academy illustrates the training provided.

Organization and support.—The Academy is owned and operated by the State of Maine through a board of trustees apointed by the Governor and is jointly supported by the State and the Federal Government. Maine leases to the academy the buildings, formerly used by the Eastern State Normal School, which have been modernized and expanded. The Federal Government furnishes a training ship plus considerable other equipment, and an appropriation of $25,000 annually for current support. It also provides up to an additional $25,000 which is used to pay the per capita cost of out-of-State students. The State of Maine appropriates $50,000 annually for current support.

Program of study.—Under war conditions the program of study was reduced to an 18 months' period. Periods of about 6 months of study at the academy are alternated with two cruises of 3 months each for the purpose of practical application of the academic courses in navigation, communications, cargo handling, ship maintenance, seamanship, and engineering. The academic program is being extended with each class. The class beginning July 1945 will complete a 24 months' program.

The legislature of the State of Maine has passed a bill giving the Maine Maritime Academy permission to grant degrees of Bachelor of Science upon graduation, after the successful completion of a properly accredited curriculum. Such a course will cover 3 full calendar years with a minimum of 128 semester hours and will include sufficient college cultural subjects to qualify for a professional degree. Plans for the establishment of this course are now beyond the formative stage, and it is hoped it will be placed in operation in the not too distant future. A similar program of expansion is under consideration by the other State maritime academies.

The academy offers programs of study for deck midshipmen and for engineering midshipmen. The curriculum for the deck group includes navigation, seamanship, shipping economics, meteorology, communications, ship construction, and stowage of cargo. That for engineering midshipmen includes reciprocating and turbine steam engineering, Diesel engineering, electricity, and machine shop practice. Both deck and engineering students receive instructions in mathematics, naval science and tactics, including military drill, first aid, personal hygiene, and in handling small boats under oars and sail. Work in mathematics includes arithmetic, algebra, geometry, and trigonometry. Naval science for all midshipmen includes the study of naval regulations, traditions, and history plus gunnery applicable to the armament carried on merchant vessels in wartime. The nature of other courses is indicated by their titles.

Faculty.—The program of instruction is directed by a rear admiral of the United States Navy and is conducted at the present time by 15 faculty members who hold active or inactive commissions in the United States Naval Reserve or the United States Maritime Service. They are asisted by 3 chief petty officers of the United States Navy. Staff members for the most part are graduates of maritime schools and experienced officers in the Merchant Marine Service and United States Navy. Several of the faculty, in addition to practical experience in the Navy and the Maritime Service, have had extensive teaching training and experience. Some hold masters' degrees from recognized colleges.

Admission requirements.—Admission to the academy is limited to male citizens of the United States who are between 17 years and 23 years of age on the date of entrance. At the time of entrance they must be unmarried and may not marry during the training period. Physical and health requirements are similar to academies that train officers for the armed forces and must necessarily be more rigid than in the average civilian institution of college grade. Greater risk and responsibility for life and property make such standards imperative rather than merely discretionary. A candidate for appointment must possess a high-school certificate of graduation. Specific items in subject requirements have been maintained during the war and include algebra, geometry, physics or chemistry, and four years of English.

Enrollments.—The normal complement of each class is 110 men. At the present time there are two classes at school, giving a total enrollment of approximately 220 cadet-midshipmen.

Under regulations for State maritime academies promulgated by the War Shipping Administration, one-third of the appointments to the Maine Maritime Academy can be made from States other than Maine. By a resolution of the board of trustees, in agreement with the other State maritime academies, students will not be admitted at Castine from those States that have academies of their own.

Currently, 65 out-of-State students are enrolled at the Maine Maritime Academy. They represent 10 States, those farthest removed being Mississippi and Michigan.

NORTHEAST JUNIOR COLLEGE OF LOUISIANA STATE UNIVERSITY, MONROE, LA.

The Ouachita Parish School Board in 1931 founded the Ouachita Parish Junior College and operated it under this name until 1934. In the latter year an agreement, authorized by a special act of the legislature, was made between the Ouachita Parish School Board and Louisiana State University which provided that the college was

to be operated as a branch of the University and to be known as Northeast Center. Later the name was changed to Northeast Junior College of Louisiana and the title to that portion which had originally belonged to the Parish School Board was transfered to the University.

In the meantime the Ouachita Parish School Board, as a contribution to the war effort, built the Ouachita Valley Defense School (1941), which was operated by the Federal Government as a war production school until June 1944. By act of the legislature in 1944 this institution was taken over and organized as the Ouachita Valley Vocational School for the Monroe and West Monroe area. It is suported by State and Federal funds and is operated under the State Board of Education. This school is equipped for trade training in auto mechanics, electricity, radio, machine shop work, and aircraft engines. It is located about 3 miles from the Junior College. Reference is made to it here because of certain cooperative relationships between it and the Junior College.

Objectives.—The purpose of the Louisiana State University in maintaining the Junior College at Monroe is "to bring the facilities of the University closer to the young men and women of northeast Louisiana at a greatly reduced cost."

In accordance with this purpose, the Junior College offers to freshmen and sophomores the same courses as are offered on the main campus of the University at Baton Rouge. High-school students of northeast Louisiana who plan to attend the University are advised to attend the Junior College during their freshmen and sophomore years and then enter as juniors at the State University. Other students, who do not plan to enter the University for more advanced work, are also encouraged to attend the Junior College and special effort has been made to provide instruction that is adapted to their purposes.

In the Junior College there has been some divergence of opinion as to whether the program should be primarily for the purpose of providing the first 2 years of a college education or whether it should serve community needs in a much broader way. The conflict has not been resolved entirely, partly because of the war situation. The emphasis is largely on the preparatory (for advanced study) function, but considerable attention has been given to instruction that is terminal in character for young people who will not pursue further education leading to degrees.

Both day and evening classes are provided, but the day enrollments by far outnumber the evening students.

Curricula.—Curicula which constitute the freshmen and sophomore years of 4-year curricula are offered in arts and sciences, agricul-

ture, home economics, business administration, secretarial science, teaching, and music. Preprofessional preparation is also provided for the fields of medicine, dentistry, and veterinary medicine. In general, the courses in these curricula are like those of the corresponding years in the respective college and university curricula. They are directly patterned after the offerings in Louisiana State University.

Terminal curricula have been aranged in general education and in the following vocational fields: Agriculture, home economics, business administration, secretarial science, merchandising and retailing, engineering, aviation, mechanics, and radio technics. A study of these terminal curricula reveals that, except for a few courses, they are like the corresponding preparatory curricula. The terminal curricula include a few more practical courses than are found in the other curricula. In general, the terminal curricula provide opportunity for a fair amount of general education in addition to instruction in technical and practical courses.

Two terminal curricula illustrate the education that is provided for youth who do not pursue 4-year programs. The terminal curriculum in secretarial science contains the following:

Freshmen	Semester hours	Sophomore	Semester hours
English	6	Social science	4
Social science, history, geography, accounting or economics	6	Secretarial science	6
Secretarial science	10	Accounting	6
Mathematics	6	Office practice	4
Books and libraries	1	Business machines	2
Physical education and/or military science	2 or 4	Salesmanship	3
		Business English	3
		Filing	2
		Physical education and/or military science	2 or 4
Total	31 or 33	Total	32 or 34

The terminal curriculum for preparing radio technicians includes:

Freshman	Semester hours	Sophomore	Semester hours
English	6	Physics	10
Mathematics	7	Mathematics	6
Mechanical drawing	4	Electrical engineering	3
Secretarial science (typewriting)	4	Radio	14
Radio	4	Health and physical education	1
Books and libraries	1	Military science	2
Electives	6		
Health and physical education	1		
Military science	2		
Total	35	Total	36

The shop work for terminal curricula is provided by the Ouachita Valley Vocational School. This shop work is done entirely on an individualized basis, each student following job sheets and working as rapidly as suits his purposes. College credit is given for the work by the Junior College. Only four college students took shop work in 1944–45 one in electricity and three in aircraft engine mechanics. Owing to limited shop facilities, only 6 students could be accommodated at one time in aviation shop mechanics. Shop courses were also available in motor mechanics, radio, and machine shop.

The aviation mechanics program grew out of a former program in aviation flight training, which was discontinued in 1944. Many students have been trained in aviation mechanics for the nearby airport. The radio technician work began as a Government-sponsored course in connection with the local broadcasting station.

A new preradar curriculum is being undertaken this summer. The immediate objective is to prepare for the Navy radar test for 17-year-old boys. After some experience with a 9-week course, the training is to be developed in a 2-year terminal curriculum.

From time to time local establishments request the Junior College to offer certain courses and curricula for their employees. Such instruction is sometimes given at the College and sometimes in the plant of the concern.

A cooperative plan is in operation in merchandising and retailing, under which each day the student spends a half day in the College and works a half day in a store. About 20 positions are available, which is as many as can be handled with the present enrollment.

Students.—Students are classified as regular, special, and irregular. Regular students are scheduled for at least 10 hours of classwork. A special student is one, over 21 years of age, who does not meet the regular entrance requirements, but who has been admitted to certain classes for which he is qualified. An irregular student is one who has satisfied entrance requirements but, because of special circumstances, is allowed to schedule less than 10 hours of course work.

The number of students enrolled during the fall quarter of 1944 were:

	Men	*Women*	*Total*
Freshmen	105	135	240
Sophomores	28	44	72
Special	7	81	88
Irregular	1	11	12
Total	141	221	362

Of the total number of students, 200 were from the parish (county) surrounding the Junior College; 14 were from other States, and 5 were from two Latin-American countries.

Owing to the war the number of students is considerably smaller than in some previous years. During 1941–42, 743 students—403 men and 340 women—were in attendance, and 1939–40, 565 students were enrolled.

Exact data are not available on enrollments in terminal vocational curricula, but it is estimated that prior to the war about 20 percent of the students were pursuing such curricula. It is stated that in business administration and secretarial science the students in terminal curricula outnumber those in the corresponding preparatory curricula, but that the reverse is true in other fields.

LOS ANGELES CITY COLLEGE, LOS ANGELES, CALIF.

The Los Angeles City College is a tax-supported community institution giving post-high-school education service under the administration of the Los Angeles City Schools. It has the status of a 2-year junior college. It serves the youth and the citizens of the community who desire occupational and educational training, personal guidance, and adjustment to today's problems and tomorrow's needs.

Purposes of terminal curricula.—The terminal curricula of the Los Angeles City College are designed to provide the social and cultural outlook and the vocational training for what are often called the semiprofessional occupations. These are ocupations which are approximately midway between the trades and the professions both in their nature and in their requirements. They require education and training above that available in the high school, yet they do not require the highly technical or scholarly training provided in the university.

The terminal curricula and courses are designed to develop competency in the practical knowledge, the principles of practice, and the general nature of the occupational field of the student's choice. The student is also provided with a workable and salable skill in this occupation area which will enable him to enter and hold a position with capacity for improvement and promotion. The proportion of specific occupational training and education to that of general education is, in general, in the ratio of 2–2–1 a ratio of two units of occupational training to two units of general education and one elective unit which may be selected from either the occupational courses or the general educational courses. The aim is to develop competency in the requirements of successful social, civic, personal, and occupational living.

Development of curricula and activities.—Curricula and courses are organized and developed in the closest possible relationship with the requirements of present-day occupational practice and social, civic, and personal living. The requirements for curricula and courses are learned through community, industrial, and business sur-

veys, and through cooperative committees composed of key community persons and faculty personnel. There is a different committee for each of the occupational curricula.

The terminal courses of the occupational curricula are so adjusted as to give full consideration to the abilities, the background of understanding, the experience, interests, and ambitions of the student. The method of instruction, the content of the course, the level of understanding demanded, the objectives sought, must match these conditions.

The extracurricular activities are so organized as to integrate the learning of the classroom with the occupational ambitions of the students. Various clubs and societies tied in with occupational and social interests are made available to students. These develop personal qualities, leadership, and civic responsiveness and responsibility in the student members.

Curricula offered.—The terminal ocupational curricula offered are: (1) Airline operations and management; (2) art; (3) business curricula: accounting and bookkeeping, clerical, general business, merchandising, secretarial, legal secretarial, medical secretarial; (4) dental assistants; (5) drama; (6) engineering: aviation, civil, electrical, mechanical; (7) journalism; (8) laboratory assistant; (9) general law; (10) music; (11) police service; (12) photography; (13) radio: radio broadcasting and production, radio-technical curriculum; (14) recreational leadership. This listing is not necessarily complete, as new occupations in many of these fields are constantly in formation.

Dental assistants curriculum an example.—To illustrate the more detailed organization of these curricula, and the way they have been developed, the following account is given of the dental assistants curriculum, since it manifests the basic technique of construction and organization for all terminal curricula whether these curricula prepare for a family of occupations or for a single vocation.

The dental assistants curriculum prepares women to serve as assistants and/or secretaries in the office of a dentist. Prior to registration in the curriculum, the student is given a physical examination and a dental assistants entrance examination (a battery of specially prepared tests measuring intelligence, aptitude, and personality traits), and a personal interview before a special committee. Throughout the course of study, the student's scholastic record is examined and used to determine the fitness of the student for this work and for continuation in the training.

The curriculum is organized and the course content determined through the assistance of an advisory committee. This committee is made up of representative dentists, representatives of the Dental Association, and selected members of the college faculty. This com-

mittee meets with the faculty giving the courses of the curriculum at stated times during the year. At regular intervals dentists assigned by the committee attend the technical classwork of the courses, observe the work, give demonstrations, lectures, and hold clinics. Through the helpful advice of this committee it is possible to modify the curriculum and the course content in keeping with the most recent developments in the dental field and with living principles of methods and practice in dental work. Placement of graduates of this curriculum is largely the work of the dentist members of this committee in cooperation with the College Placement Office.

Follow-up studies are made at frequent periods.—Los Angeles City College has adequate equipment for the curriculum in training dental assistants. This equipment includes: Chair; unit; sterilizers; operating light; cabinet; instruments; latest model of X-ray machine and chair; processing room; dental laboratory; lathe; electric model trimmers; electric inlay furnace; electric porcelain furnace; air compressor; oxygen and air torches; centrifugal and pressure casting machines; lecture room with facilities for motion picture projection.

Content of the dental assistant's curriculum.—The curriculum for preparing dental assistants contains 18 subjects:

1. Dental office procedures, 288 hours: Simple laboratory techniques; manipulation of filling materials; care of instruments, supplies, and equipment; chair side assistance; patient management; housekeeping and dental hostess duties; sterilization.

2. Dental economics, 72 hours: Records and recall plans; banking; credit arrangements and collections; dental correspondence; filing and insurance; purchasing supplies and equipment; patient education and child psychology.

3. Actual practice, 180 hours: Direct experience in the dental field.

4. Psychology, 54 hours: Personality problems and adjustments.

5. English, 108 hours: Fundamentals of grammar and appreciation of literature.

6. Political science, 54 hours: Activities and constitutional structure of our Government.

7. Personality and social adjustment, 36 hours: Personality adjustment to society; "A fine personality is not an accidental gift, but an achievement."

8. Dental anatomy, 126 hours: Nomenclature; pathology, histology; specific dental anatomy; four different types of teeth carved (emphasis on tooth differences); dental assistant's relationship to dental anatomy.

9. Dental radiography, 54 hours: Arrangement and care of X-ray rooms, equipment, and supplies; instruction for operating machine; case history data necessary and patient instruction; correct seating

of patients; angulation and placement of films; instruction for preparation of developing solution, use and care of ready-made solutions, operation and maintenance of darkroom equipment and supplies, developing films, mounting films, care and use of shadow boxes, and filing films for future use.

10. Gregg shorthand, 180 hours: First term, 50 to 60 words per minute on new material; second term, 80 to 100 words per minute on new material.

11. Typing, 180 hours: First term, 25 words per minute; second term, 40 words per minute.

12. First aid, 18 hours: A practical study in administering emergency treatments.

13. Health, 36 hours: A consideration of physical and mental well-being.

14. Nursing, 36 hours: Theory and practice of elementary nursing procedures.

15. Laboratory technique for physicians' assistants, 54 hours: Routine tests and asepsis.

16. Dietetics, 72 hours: Study of the nutritive value of foods and principles and methods of preparation.

17. Science briefs, 108 hours: Fundamentals of physics, chemistry, and bacteriology applicable to dental assisting.

18. Anatomy, 72 hours: Study of the general body structure.

Degree.—Graduation in any of the terminal curricula leads to an associate in arts degree. The general requirements for all plans of graduation stipulate the following minimum requirements:

1. A "C" grade average must be maintained for all work taken.

2. Sixty units of college work, including: English or speech, 6 units; physical education, 4 units; health, 2 units; science or mathematics, 6 units; social sciences, 6 units; American institutions; major curriculum (selected from the curricula listed earlier in this account), 20 units.

STEPHENS COLLEGE, COLUMBIA, MO.

Stephens College is among America's largest junior colleges for women, having an enrollment of more than 2,000 students. The institution offers a considerable number of courses of study of a "terminal" nature, although the majority of its graduates continue in special, vocational, or general work in other institutions after leaving Stephens. Moreover, college staff members in constructing, administering, and teaching general education courses, special subject offerings, and instructional materials in broad occupational fields, constantly take into account the fact that the great majority of the graduates of the college marry within 5 years; that probably the

majority of them are interested, sometime in their lives, in securing gainful employment which does not demand 4 years of training; and that college courses as a rule provide the last continuous and organized instruction the student ever receives concerning many important aspects of life and living.

Objectives.—In deciding upon the fields in which to offer preparation, Stephens, since 1920, has studied the activities, interests, and instructional needs of women. Stated in terms of objectives, the general fields of work attempted include the all-around development of the student for competent and complete living in her home and community; the development of her social outlook, so that she can participate effectively in solving the civic and other social problems of her local, regional, or national communities; assisting the student to learn the basic principles of hygiene, sanitation, and health, and to apply them to her own physical well-being, or to that of her family and community; and, finally, giving the student a sufficient knowledge of vocational opportunities, and of vocational skills, to enable her to become self-dependent. In offering such preparation, the college has organized its work into 10 major administrative divisions, rather than into departments. These divisions are: Communications, health and physical education, home and family, humanities, languages, religion and philosophy, science, social studies, vocations, and extra-class activities.

Curricula.—In keeping with the efforts of the college to base its offerings upon the discoverable needs and interests of its students and to maintain truly functional offerings, a variety of terminal or semi-terminal curricula, based upon the actual vocational needs of its graduates, are made available. These curricula are supplemented by a number of organized extra-class programs. Changes are made freely in all curricula to meet the needs of individual students. The courses of study are general patterns or guides, rather than fixed, unchangeable units of instruction. Curricula are adapted to students, rather than students to curricula. The "type curricula" normally offered, including the work in special fields and broad areas, are: General education (for nonuniversity students), music, art, aviation, speech, dramatic arts, radio, homemakers' course (general), nursery school, social work, secretarial studies, merchandising, laboratory technician course, "finding" courses, and, in addition, a considerable number of preprofessional, lower division, and other nonterminal curricula not of primary interest in this report.

Even in the specifically vocational curricula, a charted plan of study showing recommended courses in general education is made available to all students. Vocational students are strongly advised to take additional work in other divisions which offer nonvocational

work. Administrative requirements limit the amount of strictly vocational work which a student may take.

The stated purpose of the general education curricula in Stephens is "to give a type of training which will develop intelligent self-direction in the numerous personal and social problems of everyday living." There are two 2-year courses of study in general education. Course one, which is recommended to students who do not plan to enter senior college or university work, permits a freer choice of electives, places less emphasis upon mathematics and languages, and is more flexible than course two, which is taken chiefly by students who plan to enter advanced work in liberal arts.

As a prerequisite to the establishment of its curricula, Stephens has ascertained the vocational destinations of its graduates over a considerable number of years. These graduates are to be found in almost every vocation followed by college women. Of a sampling of 944 women who graduated between 1926 and 1941, 469 entered teaching or secretarial work. Other vocations commonly followed include those of the clerical worker, social service worker, librarian, interior decorator, nurse, musician, general office worker, and government worker, as well as a wide variety of additional occupations for which basic or general preparation only is offered by the institution.

Type curriculum.—An example of the type curricula is the curriculum in aviation. Its purpose is to prepare women for positions in the commercial air industry. The occupational demands in this field are growing, as indicated by the fact that 12 of the Nation's leading airlines sponsored the setting up of this curriculum. Admission requirements, total credit requirements for graduation, etc., correspond to those for the junior college as a whole. Following is a typical recommended course of study. It will be noted that the first year is devoted almost entirely to general education.

FIRST YEAR

Course	Semester hours
English composition	6
General geology (aviation section)	6
Foreign language	6
Beginning and intermediate typewriting	6
Electives: (Fundamentals of speech, Social problems, Psychology, Introduction to literature)	6
Physical education	1
Total	31

SECOND YEAR

Course	Semester hours
Principles of geography	3
Psychology of personnel	3
Foreign language	6
Elementary aeronautics	3
Basic airline traffic procedures	3
Hygiene (Aviation section)	1
Electives: Consumers' problems, Philosophy, Sociology)	12
Physical education	1
Total	32

A third year of apprentice work is offered for students wishing further specialized training in aviation. Working experience is gained through a campus "dummy" airline corporation, field trips, first-hand observation, class instruction, and flight experience. A special building, Aviation Hall, and an airport where practical flight experience is provided, are only about 2 miles from the main campus. Any student in any aviation course can elect a limited amount of flight experience. Such practical training is highly desirable in orientation, demonstration of applied theories of aerodynamics, chart reading and observation of the effect of weather on flight, and application of the student's own knowledge with respect to basic principles.

Since the great majority of Stephens College women marry within 5 years after graduation, the offering of a general "terminal" curriculum in homemaking is particularly appropriate in this junior college. Inasmuch as satisfactory preparation for the exceedingly broad field of homemaking can never be narowly vocational, the courses are offered in a variety of subjects. A home economics curriculum is also available for students who expect to go on to other colleges to complete degree requirements. The distribution of the courses offered in the general curriculum in homemaking follows.

FIRST YEAR	*Semester hours*	SECOND YEAR	*Semester hours*
English composition	6	Child study (including observation in nursery school	3
Social problems	6	Psychology	3
Foods	6	Introduction to art (or philosophy)	6
Introduction to literature	6	Consumers' problems	6
General biology	6	Elementary clothing	6
Electives: (Religious fundamentals, Principles of interior design, Personal appearance, Money management)	2	Marriage and the family	6
		Electives	2
Physical education	1	Physical education	1
Total	33	Total	33

Admission requirements.—The requirements made by the College for admission to its junior year are about the same as those made by accredited colleges elsewhere for admission to their freshman year, since the 4 years' work at Stephens begins at the level of the junior year in a regular 4-year high school. Fifteen or more satisfactory units of credit from fully accredited high schools are required. Recommendations are made concerning some of the subjects in which such units should be offered, but these are somewhat flexible. As in other junior colleges of the 4-year type, transition between high-school and college work is effected without difficulty.

Provisions are made for the admission of special students who do not fully meet the regular admission requirements.

A selective factor of an economic nature enters, to some extent, into the admission of students, inasmuch as the cost of attendance at Stephens College is relatively high in comparison with junior college costs in general. Somewhat more than $1,000 annually is needed to meet all tuition charges, living costs, and other college expenses.

Graduation requirements.—Students who have completed the senior year of the junior college are awarded the degree of associate in arts. The requirements for this degree include completion of 62 college credits, of 2 semesters of English composition, and of 4 semesters of physical education, but the requirements have considerable flexibility in the wide range of electives open to the student. However, the student is not permitted to follow her scholastic inclinations blindly. She is informed concerning the requirements of States in which she may wish to secure certificates in special or vocational subjects, and of institutions to which she may wish to transfer. When she enters a vocational terminal course, she is expected to follow definitely prescribed requirements rather closely because she will need to attain proficiency in the vocational field she selects.

Breadth of view.—The philosophy and practices of the college in the administration of terminal vocational courses are in noteworthy contrast to those of strictly vocational schools which provide only the barest possible arts and science content necessary to forward the purely vocational objectives of the students. Stephens College students who pursue terminal vocational courses are required to supplement their specialized vocational study with related courses in general education, selected with an advisor's counsel, in the interest of their personal growth and development.

Extra-class activities at Stephens are believed to have very important educational values, if properly organized and administered. Accordingly, these activities are organized in a regular division of the college, to which four staff members are regularly assigned. The work is planned not only to meet the present and future leisure-time needs of the students, but also to provide a normal community environment for the development and practice of desirable habits and abilities, for the development of initiative and leadership, and for experience in the art of group living and social adjustment.

Staff and facilities.—The institution fully meets such regional and State accreditation standards as apply to its faculty. Of approximately 240 instructional staff members in the college, 39 have the doctor's degree as their highest, 97 the master's, and 62 the bachelor's. The remainder are variously qualified, through both training or experience, for special services in such fields and subjects as nursing, music, and technical vocational work. There is evidence that espe-

cial care is used to secure instructors who share the philosophy of the college and have the ability and willingness to apply it.

Thirty-five buildings, 20 of which provide residence accommodations and a 225-acre campus constitute the junior college plant. The general library contains more than 30,000 volumes, and there are numerous divisional libraries whose total collections are approximately half as large as those of the general library. A wide variety of periodicals, audio-visual instructional materials of many types, and similar teaching aids are available. For specialized vocational training, modern machines and other equipment are provided.

Summary.—Outstanding characteristics of Stephens College of special interst in this account include, then, its study of the activities, interests, and instructional needs of women as a basis for its selection and organization of curriculum and course content; its emphasis upon highly functional curricula and upon flexible, personalized patterns of work, in general education as well as in vocational fields; its insistence upon a reasonably well-rounded education for students taking specialized vocational courses; and its emphasis upon intelligent self-direction by students, to the end that they may develop more fully as individuals and as worthy members of family, community, and other social groups. Economic self-dependence is taught, but in due relationship to other essential educational outcomes. The foregoing characteristics are not confined to Stephens, but they are examplified much more clearly there than in many other institutions following conventional academic or strictly vocational patterns of instruction.

Chapter VI. TERMINAL VOCATIONAL PROGRAMS IN COLLEGES AND UNIVERSITIES

WAYNE UNIVERSITY, DETROIT, MICH.

WAYNE UNIVERSITY operates under a philosophy which dictates that, within the realm of educational programs distinctly of college grade, its offerings shall be of such a nature and shall be organized in such patterns that they meet, as well as may be, the needs of the individual citizen in the community it serves. The institution's leaders recognize that such an objective cannot be attained for all students through conventional degree curricula. In addition to such curricula, therefore, a number of 1- and 2-year certificate curricula, as well as a wide variety of "elective courses," are offered, in which students whose college work terminates short of a bachelor's degree may enroll on either a full-time or a part-time basis.

Informal character of terminal education.—Any analysis of terminal education at Wayne University must recognize that only a fraction of the work can be organized into formal and relatively rigid curricula. Indeed, because of budgetary considerations, the institution has found it administratively inexpedient to establish such programs except when it can be assured that the potential clientele for certificate work in a given field is fairly numerous and has clearly defined and distinctive, yet similar, educational needs. Many of the students who seek part-time college work in so complex and industrial a community as the metropolitan area in which Wayne University is located have specialized needs that can be satisfied only by a sequence of courses selected on an individual basis. For these students, no conventional selection could be thoroughly functional. Such informal "curricula" are largely vocational in character. For the vast majority of the people taking them, college work is confined to a few semesters' attendance and is terminal in the sense that it ceases upon satisfaction of the vocational need experienced by the individual.

Wayne University recognizes the importance of such informal, vocational, terminal education by encouraging the enrollment of part-time students in evening and Saturday classes and by providing counseling service for the students who wish aid in making an optimum selection of course work. To students who desire formal evidence of the completion of such a program, it issues, through its School of General Studies, a general certificate upon the satisfactory completion of 60 semester hours of college work.

How extensive this informal, vocational, terminal education is at Wayne University cannot be reported precisely. Enrollments in the

"nonmatriculated" division, in which such students would normally be classified, usually total 2,000 to 3,000 students. The number working on individually selected programs, who are taking courses that are vocational in character, and the number registering for classes which are nonvocational cannot be ascertained from available statistics.

Formal terminal curricula.—The formal vocational terminal curricula which are provided at Wayne University are offered through several of its colleges and schools, although most of them are administered through the School of General Studies. In 1944–45 two of these curricula were offered in cooperation with other agencies, and the certificates granted upon their completion were issued jointly by the University and the cooperating institution. The balance of the curricula are regularly sponsored solely by the University, and certificates are issued through authority delegated to the school or college concerned.

The two curricula sponsored cooperatively with outside agencies are the following: (1) A curriculum in banking, offered in cooperation with the American Institute of Banking; and (2) a curriculum in industrial training, sponsored jointly by Wayne University and the Chrysler Corporation. The latter curriculum is new. It provides 15 semester hours of work for trainers of apprentices and for foremen employed by the Chrysler Corporation. The courses required include: Fundamentals of speech, 2 hours; expository composition, 3 hours; psychology of learning, 2 hours; history of education or philosophy of education, 2 hours; job and trade analysis, 2 hours; philosophy of vocational education or educational policies of industry and business in the community, 2 hours; and methods and techniques used in industrial schools, 2 hours. The faculties of the College of Liberal Arts and the College of Education provide the instruction under the auspices of the College of Education.

Education.—The Wayne University College of Engineering offers five curricula for students who desire to obtain certificates upon the completion of about one-half of the number of hours required for a degree in engineering. These curricula are planned for individuals taking apprentice training and others who do not find it feasible to take the entire engineering program leading to a degree. The curricula are intended to develop in the student proficiency in some definite line of endeavor such as design, drafting, or metallurgy. Certificates are granted upon the satisfactory completion of 65 semester hours of work.

The five curricula are in the following fields: Chemical or metallurgical engineering; civil engineering; electrical engineering; mechanical engineering; and general engineering. Courses in English, speech, physics, and mathematics constitute the core common to all

five curricula, to which specialized courses and electives are added to complete the requirements for a particular certificate.

The School of General Studies at Wayne University conducts an educational program on the junior college level for students who desire to pursue certain vocational curricula for the purpose of becoming fitted for useful employment in business, industry, or public service. The curricula now offered in the School of General Studies are in the following fields: Accounting, cooperative retailing, distributive education, mortuary science, practical nursing, and secretarial science. Students enrolled in these curricula, like other students, enjoy the numerous advantages offered by the University, such as: A faculty selected from the departments in the sciences and in the arts of the various University colleges; the possibility of supplementing technical training with courses of a more liberal character; and the accessibility of the general University service, the University Library, Library, the counseling service and the service rendered by the student organizations in extra-curricular activities.

The curriculum in accounting, which here is arrayed in detail, is representative of the curricula offered in the School of General Studies. Sixty hours of credit are required for a certificate.

FIRST YEAR

Semester I	*Hours*	*Semester II*	*Hours*
English 5G	3	English 6G	3
Accounting 1G	4	Accounting 2G	4
Mathematics 23G	3	Mathematics 24G	3
Bus. Adm. 52G	3	Economics 51G	3
Elective	2 or 3	Elective	2 or 3

SECOND YEAR

Semester I	*Hours*	*Semester II*	*Hours*
Accounting 3G (Advanced Principles)	3	Accounting 4G (Advanced Principles)	3
Bus. Adm. 101G	2	Bus. Adm. 102G	2
Economics 101G	3	Electives	10
Elective	7 or 8		

ELECTIVES

Business Administration 2G	Psychology 104G
Engineering Drawing 2G	Speech 102G
English 150G	Soc. Science courses for which prerequisites have been fulfilled.
Geography 1G	
Physical Education	

Admission requirements.—Students may enroll either as full-time or part-time students, but in either case they must meet college admission requirements. Candidates for admission must present transcripts of credits from the high schools from which they have graduated or from other colleges they have attended, and those applying imme-

diately following graduation from high school must be recommended by the principal of their high school. In determining whether a student should be recommended, the high-school principal and counselors are asked to take into consideration as many as possible of the factors which are related to the probable success of the student in the kind of work he proposes to study at Wayne. These factors include the student's interests, aims and objectives, capacities, educational background, and personality. No definite scholastic rating in high school is specified as a minimum for recommendation, the purpose being to select students who may realize their educational needs through terminal curricula more fully than through the degree curricula of the University. High-school graduates who are not recommended by their principals may gain admission by successfully passing entrance examinations.

Students desiring admission to the curriculum in mortuary science must, in addition to meeting the above requirements, qualify for admission by appearance before a member of an admissions committee for a personal interview and by receiving a recommendation of that committee for admission.

UNIVERSITY SYSTEM OF GEORGIA CENTER, ATLANTA, GA.

The University System of Georgia Center is an institution of higher and adult education which operates: (1) A junior college program of day classes, and (2) an evening college. Established in 1934, it was the successor of the Georgia Tech Evening School of Commerce which had been in operation for 20 years. The Center is controlled by the Board of Regents of the University System of Georgia. It is a separate unit of the State's system of higher education, and it is independent of the University of Georgia.

Objectives.—The objectives of the instruction are indicated in part by seven types of students the Center tries to serve: (1) Those desiring specialized training for military services and for the Civil Service; (2) students wishing to receive the degree of bachelor of commercial science conferred for work at the Center; (3) students desiring to take work toward college and university degrees and who will transfer to other institutions to complete their study for those degrees; (4) students wishing to complete certain preprofessional education; (5) students desiring to complete junior college curricula; (6) students wishing to obtain diplomas in commercial and business fields; and (7) special students taking selected courses but not having in view extensive programs of study.

The program of the Center is adapted to serve the needs of the community. A close relation is maintained with business establishments by way of providing instruction which employees wish to have

and by way of placing students and graduates in positions. The emphasis is on education for business and commercial pursuits. The Center offers no work in engineering and other technical fields. Such instruction is provided through an evening school maintained in Atlanta by the Georgia School of Technology.

Junior College.—The Junior College offers three types of curricula. One group meets the junior division requirements for the degree of bachelor of arts, bachelor of science, bachelor of science in commerce, bachelor of arts in journalism, bachelor of science in home economics, and bachelor of science in education, the students transferring to other colleges and universities to complete the senior division requirements. Preprofessional programs are offered for the fields of law and medicine. Finally, well-arranged terminal curricula, 2 years in length, are offered in business administration, secretarial training, and technical laboratory work. Most of the Junior College students pursue curricula which are preparatory for more advanced college work, but even these curricula are in reality terminal for many of the students, the majority of whom are not financially well-to-do and cannot continue their education beyond the Junior College.

The terminal curricula, although aimed at vocational objectives, are not narrow in content. In common with the preparatory curricula, they include a number of survey courses which are given to students throughout the entire University System of Georgia. All the courses included in the terminal curricula carry college credit, and students may change to related degree curricula with very little loss of credit. Some students who complete terminal curricula later take the required basic and more theoretical courses for the degrees.

Junior College classes are scheduled for the afternoon, beginning at one o'clock. This arrangement makes it possible for students to work during a part of the day and attend college during the remaining time.

Evening College.—The program of the Evening College is intended for men and women who are employed during the day. Some of these students have recently graduated from high school; others have been employed for years. The average age of the evening students is 24 years. They are men and women who could not afford to attend college full time, or who preferred to go to work rather than to college, or who, after they were employed, found that they must acquire more education to make progress in their work. About one-fourth of the evening students have previously attended college but found that for some reason, usually financial, they were unable to continue in college full time.

The Evening College offers a 4-year curriculum (on a full-time basis) which leads to the degree of bachelor of commercial science.

The field of concentration in the senior division may be in social sciences, accounting, finance, industrial relations, marketing, secretarial studies, or statistics. This curriculum receives the principal emphasis in the Evening College. Its completion requires 195 quarter hours of credit. Evening students finish it in about 6 years.

The Evening College has arranged curricula for the completion of junior division requirements toward a number of bachelor's degrees, much on the same basis as indicated above in the Junior College. In some fields students may complete 3 years of work for the degree before transferring to 4-year institutions.

Terminal curricula requiring 100 quarter hours of credit are offered in accounting, advertising and selling, business administration, finance, marketing, and secretarial training. These programs may be completed in 3 years of evening work. They have been so arranged that those who continue for degrees in the Evening College receive full credit toward those degrees. The terminal curricula consist largely of the more practical courses from the degree curriculum. At present only a small number of students pursue terminal curricula.

Students.—Students are of two kinds: Regular and special. Regular students are those who have graduated from high school with certain credits or who have entered on examination. Special students are those who have been admitted without satisfying the listed entrance requirements but who have given satisfactory evidence of ability to do college work. Special students may become candidates for degrees by satisfying the entrance requirements after admission.

Under an action recently taken by the Board of Regents of the University System of Georgia, any student over 21 years of age may, upon the successful completion of 1 year of college work, satisfy entrance requirements without taking examinations.

Students upon entering the Center, particularly the Evening College, usually wish to enroll for a particular course or courses rather than for the completion of curricula. Effort is made by the counselors to encourage students to plan longer programs, with the result that a high percentage undertake more extensive work leading to diplomas and degrees.

During the fall quarter in 1944 a total of 1,259 students were enrolled—903 in the Evening College and 356 in the Junior College. Of this number, 231 were men and 1,028 were women. The enrollments have been much affected by the war, although less than in many institutions of higher education. The highest enrollment at the Center in the past years has been about 1,700, with the men much in the majority.

At the commencement in June 1945, 26 students received the degree of bachelor of commercial science, 17 received Junior College diplo-

mas, and 2 received diplomas for the completion of terminal curricula completed in the Evening College.

Teaching staff.—The staff of the Center consists of a director, 5 other administrative officials, 15 full-time teachers, and 43 part-time teachers. The full-time teachers are men and women with advanced training; 14 have the degree of doctor of philosophy. The part-time teachers are outstanding men from Atlanta business houses; they teach the more practical subjects.

Financial support.—Financial support is derived from fees paid by the students and from appropriations made by the State of Georgia.

Each student taking the normal program of evening work pays $24 a quarter, and the fee for the normal program in the Junior College is $29 a quarter.

The State appropriation for 1944–45 was $22,000; for 1945–46 the budget calls for $72,000. The State has been spending from $50 to $60 per student on a full-time basis.

WESTERN MICHIGAN COLLEGE OF EDUCATION, KALAMAZOO, MICH.

Western Michigan College of Education has for years offered, and continues to offer, a large number of isolated courses that have appealed to adults, such as courses in home making, appreciation of art, first aid, radio broadcasting, and the like, but these courses have been designed to satisfy temporary or limited interests of groups and not to prepare for specific positions in business or industry. Nevertheless, such isolated courses frequently lead to a series of courses and a curriculum.

Development of the program.—In the fall of 1939, the college established its first terminal curriculum. This was a program in aviation mechanics designed to train young men to become licensed mechanics in this field. Two years later the college established a terminal curriculum designed as a cooperative education program to prepare young people for sales work in distributive enterprises. In 1943, additional short programs in secretarial science and office management were added.

In the meantime, demands for the training of war workers appeared and a department which started out to be a department for the training of aviation mechanics expanded to train in short courses from several weeks to several months in length, men and women who could take on new war work responsibilities, or who could be promoted to more highly skilled positions in war industries. This led to a development of such specialized work as radio maintenance repair and communications, all types of machine trades, welding, sheet metal work, and the like.

Now that the veterans of the war are returning, with the above courses as a background, a large variety of terminal curricula in aviation mechanics, auto mechanics, machine shop work, tool and die making, trade drafting, air conditioning and refrigeration, welding, sheet metal work, printing, and linotype composition and transportation maintenance is being offered. At the same time, because of the demands on the part of veterans, the offerings in business education are advancing to special terminal courses in accounting and business administration, as well as those in secretarial science and office management.

In the fall of 1944, a new program in occupational therapy was added to the terminal programs offered at the college, this being designed to meet the increasing need for therapists to handle all types of disability cases.

Finally, beginning in the summer of 1945, a new series of terminal courses designed primarily for veterans in the field of agriculture have been established, to train young men toward practical farming rather than as scientific agriculturists.

The development of college grade vocational programs of less than degree length at Western Michigan College of Education results from the fact that large numbers of Michigan's young people graduate from high school without specific training for jobs. They also lack either the talent or interest or means to continue in college in the degree length professional programs. Large numbers of these young people have not been able to obtain employment because of immaturity and lack of vocational preparation. Western Michigan College of Education is in a population section rather heavily industrialized. A million people live within 50 miles from Kalamazoo, but few opportunities for training young people in what might be called strictly vocational fields are available. Consequently, the college, serving as it does this area of the State, has felt the responsibility for providing some opportunities for the training of such young people on a post-high-school level. Approximately three hundred students take advantage of the terminal programs each year. This number is increasing rapidly.

Trade and industrial education.—Programs of less than degree length are offered in aviation for engine mechanics, airplane mechanics and aircraft factory mechanics. Each course covers 1,260 clock hours of shop and related subject instruction in a Government-approved repair station, under the supervision of licensed mechanic instructors. Excellent shop facilities and equipment are provided. A flight program is now being added.

Programs are set up in units of instruction whose function is to develop employable skills. A unit course covers 240–270 clock hours

of shop and related subject instruction. Programs are available for machine tool operators, machinists, tool and die makers, sheet metal workers, arc and acetylene welders, radio service and communication specialists, industrial maintenance, transportation maintenance, farm equipment maintenance, cabinetmaking, patternmaking, printing, intertype, linotype composition, shop mathematics, blueprint reading and machine drafting.

Certain units and unit combinations can be completed in 16 to 18 weeks. Combinations of selected units make up 1-year and 2-year curriculums. Day and evening classes are provided to accommodate both pre-service and in-service training. Many of these classes include both men and women.

These courses are the outgrowth of experience gained in training workers in production of war materials and serve as reconversion training for workers and veterans preparing for postwar employment opportunities in the metal trades and related fields. Instruction is given by a competent staff in well-equipped shops and laboratories.

Business education.—The Department of Business Education provides terminal programs to meet the vocational needs of the following groups of youths and adults desiring specific pre-employment and in-service training in: (1) The general and specialized fields of retail selling and related distributive trades; (2) in office jobs involving the use of stenography in a highly specialized situation; (3) in the demand for general office and clerical personnel other than stenographers and secretarial employees.

Each of the above courses is offered on a 2-year terminal basis. Students who have the maturity of years and sufficient educational background to indicate ability to profit from the course of instruction may be admitted to these curricula. All registrants are high-school graduates, but many of these have not the sequences required for college entrance.

These courses are taught by the regular staff on a cooperative work-and-study basis, providing essentially for one-half day on a store or office job at regular pay-roll rates and the alternate half day in school courses relating to the job or job family concerned. It is the aim of the staff to provide, in every instance, actual job experience suited to the particular student-worker's aptitudes, abilities, and needs. The on-the-job experience and classroom activities are related as much as possible through the medium of a coordinator who makes frequent and detailed analyses of the relationships of job requirements and educational offerings.

The successful completion of these curricula leads to a vocational diploma in the field of specialization and to full-time job placement. The specific jobs for which these curricula aim to prepare students

are as follows: (1) Distributive trades: (a) retail sales clerks, (b) stock clerks, (c) window and counter display artists, (d) assistant buyers, and others; (2 office occupations: (a) stenographer, (b) typist, (c) file clerk, (d) comptrometrist, (e) machine transcriptionists, (f) duplication clerk, entry clerk, and others.

Occupational therapy diploma curriculum.—To supply needed occupational therapists as soon as possible, a 2-year terminal diploma curriculum is offered whereby students may get the essentials of training on an accelerated plan. This is preceded by 30 semester hours of college work.

During the first year, the student's work consists of courses in biological sciences, social sciences, theory of occupational therapy, and technical training such as stitchery, leatherwork, woodworking, printing, and rug making. Requirements in theoretical and technical training are completed during the first semester of the second year. The student then begins the 8 months' period of clinical training. This time is divided among different types of hospitals, such as general, tuberculosis, mental, and pediatric, so as to give the student a wider experience under the direction of qualified personnel.

Upon completion of the course, the student is eligible for examination for registration in the National Association of Occupational Therapy. Graduates are now serving in army and navy hospitals, tuberculosis sanitoriums, schools for the handicapped, curative workshops, all departments of general hospitals, and mental hospitals. Geographical range of their placement includes the whole United States and other countries.

Short courses aggregating 58 hours of instruction are offered to volunteers in the Gray Ladies Corps to train them as Occupational Therapy Volunteer Assistants. This program has been extended to include assistants in the Red Cross Arts and Skills Corps. No credit is given toward a degree or a diploma. Entrance requirements for the Gray Ladies Corps are high-school graduation or equivalent education, satisfactory health, and a pledge to serve 150 hours volunteer service, if it is called for, upon completion of training.

Agriculture.—Vocational training in agriculture in less than degree-length programs is provided for returning veterans and others who want experience and training in farm operation and management. Five groups of courses are offered: (1) Farming as a way of living—types of farming and its relation to other occupations, (2) farm enterprises—crops, livestock, dairying, fruit and truck crops, (3) farm operations—ground fitting cultivation, harvesting, stock feeding, and orchard work, (4) operation and maintenance of machinery, (5) farm management—farm account, inventories, credit, labor income, distribution of capital, and acquiring possession of land.

High-school training is a usual admission requirement but is not required of enrollees that are mature and willing to assume the responsibilities of such courses. Instruction is given by the staff who give degree courses. These students have full use of the college farm for laboratory and demonstration purposes.

CLEVELAND COLLEGE, WESTERN RESERVE UNIVERSITY, CLEVELAND, OHIO

The terminal programs for vocations in the Division of Business Administration of Western Reserve University have been developed upon the philosophy that people training for vocations should have some background knowledge of our social and political, as well as our economic system. The College believes that people in business should be taught how to live as well as how to make a living.

Vocational education programs.—The College has established a wide variety of vocational terminal programs among which are the following: Public accounting, industrial accounting, retail merchandising, organization and operation of small business, life insurance underwriting, advertising and market research, secretarial training. These programs are different in nature and content to meet the vocational needs of a wide variety of individuals, such as a purchasing agent, salesman, retailer, commercial artist, interior decorator, personnel worker, business research assistant, translator, radio broadcaster, and insurance agent. Some of these programs consist merely of a few courses, while others cover the equivalent of from two to four years of college work. Undergraduate students who meet the college entrance requirements may later apply the courses in these terminal programs toward the completion of the requirements of a four-year college degree program in business administration. Adults who cannot meet the college entrance requirements may pursue any of these programs of study for purely vocational reasons.

To illustrate the type of training offered, several curricula are set forth in detail for programs in retail training and in the training of certified public accountants.

Retail training plan.—The general objective of the retail training plan is to prepare young men and women for the merchandising occupations, including those expecting to establish their own small businesses, and to provide supplementary training for those already so employed.

The purpose of the program is to meet the needs of: (1) College students who expect to enter the employ of local and other metropolitan department stores and chain organizations; (2) college students who expect to establish their own small stores or to be employed in smaller stores in executive capacities; (3) retail stores

which desire to train selected future executive material while still in school, to meet future needs; (4) department stores and chain organizations which wish to upgrade promotional material selected from present personnel; (5) college students who later may want to complete the requirements for the degree of bachelor of business administration.

Five types of courses and training are provided: (1) General business courses designed to acquaint the student with problems and procedures of all business, including both manufacture and distribution; (2) orientation courses in merchandising to acquaint the student with the functions of retailing, store organization, and interdepartmental relationships; (3) merchandising methods courses to train the student in the accepted procedures of modern retailing as applied to various kinds of merchandise; (4) merchandise information courses covering the basic materials, with personalized training for individuals to meet part-time job requirements; and (5) job functional training, including salesmanship, executive techniques, advertising problems, personnel administration, and other courses as required.

An important part of the above program is the coordination of group and individual student training programs at the College with store work and other experiences. This demands observation of students on the job, by a selected faculty member; consultation and reports from supervisors on quality of work performed; circulation of the student employee through various assignments throughout the store (when beginning work), and frequent meetings of store personnel people with those members of the College staff involved.

The Personnel Research Institute, well known in the industrial personnel field, has already extended its activities into retailing, and now contemplates a research program for a leading local store. This work, coordinated with our training program, offers Cleveland College an unusual opportunity to be of service, particularly with respect to postwar adjustments. The results of the institute's research will be of particular value in determining the exact content of courses in the merchandising curriculum.

2-year program in business administration.—The 2-year curriculum (60 hours, 2 years full-time) in business administration leads to a certificate with specialization in subjects or courses applicable to the retail field, as follows:

FIRST YEAR		
Fall	*Spring*	*Summer*
Fundametals of business	Principles of marketing	Principles of retail mer chandising
Organization and operation of small business	Principles of accounting (first half)	Principles of accounting (second half)
Business correspondence	English composition	Salesmanship and sales promotion

SECOND YEAR

Fundamentals of advertising (first half)	Fundamentals of advertising (second half)	Material and construction of merchandise
Economic principles and problems (first half)	Economic principles and problems (second half)	Store and office executive training
Business law (first half)	Business law (second half)	Display merchandising

OTHER POSSIBLE COURSES

Open to those whose previous training or experience may cause certain suggested courses to be unnecessary.

Introduction to psychology	Psychology of personnel management	Psychology of personnel management
Business mathematics	Sources of business information	Clothing construction
Public speaking (first half)		Problems in retailing
Office management	Public speaking (second half)	Banking
Psychology of selling and advertising	Money	

1-year program in business administration.—A 1-year Training Plan with or without college credit, totaling 30 hours, or a 30-hour certificate, is offered under store sponsorship and University approval. The curriculum is:

Fall	*Spring*	*Summer*
Organization and operation of a small business	Principles of marketing	Principles of retail merchandising
Principles of accounting (first half)	Principles of accounting (second half)	Salesmanship and sales promotion
Business correspondence	Material and construction of merchandise	Store and office executive training

OTHER POSSIBLE COURSES

Open to those whose experience or training may cause certain suggested courses to be unnecessary.

Fundamentals of business	English composition	Display merchandising
Business law (first half)	Business law (second half)	Introduction to psychology
Economic principles and problems	Economic principles and problems	Business mathematics
Public speaking (first half)	Public speaking (second half)	

Program in accountancy.—A well-qualified public accountant needs a broad background of general and technical education. The social and economic significance of his work is assuming increasing im-

portance. He serves as an independent analyst and arbiter between business and government, management and labor, and between business and the general public. In addition to being technically competent, he should be well grounded in sociology, psychology, political science, economics, and English. He should know the technical subjects required in his profession, such as business law, accounting theory, auditing and taxes, and he should understand thoroughly the functional operations of business covering production, distribution, financing and management.

In addition to the necessary training, most States require at least high-school graduation and 3 years of practical accounting experience before a candidate is allowed to take the certified public accountants' examinations. Although Western Reserve University offers academic training designed to prepare candidates for the examinations, the examinations and the C. P. A. certificate are given by the State Board of Accountancy of Ohio.

As experience has shown that only exceptionally well-qualified applicants succeed in passing the examinations at the first attempt, the following subjects, available in the Division of Business Administration, are recommended as a minimum of preparation for prospective candidates:

Principles of accounting
Intermediate accounting
Advanced accounting
Cost accounting
Auditing theory
Auditing procedure
Federal taxes
C. P. A. problems review
Economics: Principles and problems
Corporation finance
Investments
Business mathematics
Business law
Statistics
Business English
Principles of marketing
Industrial management

Prospective candidates for the C. P. A. examinations are also urged to take the following courses available in the liberal arts colleges of the University: English, psychology, political science, economic history, economic geography, sociology.

INDIANA UNIVERSITY EXTENSION WORK, BLOOMINGTON, IND.

For more than 40 years Indiana University has carried on extension work. In 1912 this service was organized in a department, and in 1914 a Division of Extension, coordinate with the schools and colleges of the University, was established to have the work in charge.

At present the Extension Division consists of two branches: (1) The Public Welfare Service, which has to do with the less formal, traditional, and standardized forms of instruction and education; and (2) the Extension Teaching Service, which embraces the more formal and standardized work of instruction by correspondence

courses and extension classes. The chief item of concern in this report is the instruction through classes.

Types of extension work.—Several types of extension classes are conducted in the State, chief of which are college courses in the larger cities and towns. Large offerings, principally freshman and sophomore courses, as well as advanced and graduates courses, are scheduled at the five cities designated as extension centers, each in charge of an executive secretary. These centers are: Indianapolis, Fort Wayne, Calumet (East Chicago), South Bend, and the Southeastern Area (Jeffersonville). Classes, administered by the Extension Office in Bloomington, are also conducted in other towns and cities of the State. The greater part of the extension work by far is done in the five centers.

The extension centers have considerable leeway in planning their work within the general policy laid down by the University and the University Extension Division. The University faculty has jurisdiction over academic matters and it sees that standards are maintained. The center to a very large extent develops its own program, keeps its own records, makes local certification of courses completed as may be requested, and sends out grades. Certificates are also sent out by the University registrar for certain purposes. With respect to noncredit work, the center has full autonomy, but courses for credit must be aproved by the University Extension Division and by the departments concerned.

This flexible organization makes it possible for the extension centers to develop educational programs that are in accordance with the needs of their respective communities. At the same time the communities have assurance that the work is of high standard because the University approves and supervises it. Moreover, inasmuch as the work of the centers is carried far beyond the freshman and sophomore years, it gains a prestige that cannot usually be had where vocational work is carried on in isolation from other forms of educational activity.

The courses taught in extension classes fall into three general categories: (1) College courses, which for the most part are undergraduate courses for the College of Arts and Sciences together with courses in education, business, and music; (2) graduate courses carrying credit for advanced degrees; and (3) special courses, some arranged as noncredit lecture series, others carying regular college credit. Among the special courses have been instruction for nurses, bankers, insurance groups, social service groups, and real estate groups. Only a very small part of the work is noncredit as measured by the number of courses and activities carried on.

Classes of students.—Four classes of students constitute the large majority who take the courses. First, there is a sizeable group who

cannot afford to attend college as resident students, at least not at the time they enroll in extension courses. A goodly number of them expect, however, to become resident college students at a future date. Second, there are a small number of students who have not made good in resident work in college. Third, a large group are employed on full-time work in offices, schools, and industries. Most of them take extension courses to gain advancement in their jobs, although many enroll because of a desire for personal improvement. Finally, a number enroll to meet certain requirements for work, such as civil service positions. Formerly teachers constituted a high percentage of the enrollees, but the percentage of students in this category is decreasing.

Terminal programs.—In recent years many persons have enrolled for vocational courses, particularly accounting and secretarial courses. Inasmuch as it was felt that these students should pursue integrated programs, a 2-year (60 semester hours) terminal curriculum was organized in secretarial training leading to a special certificate. It consists of: Typewriting, shorthand, English composition, commercial correspondence, accounting and electives, the electives constituting half of the program.

A 2-year (60 semester hours) curriculum has also been organized to prepare laboratory workers. Approximately one-third of the time is devoted to electives, and the rest is given to chemistry, physics, mathematics, and English.

Both of these programs are offered at the Calumet Center and the Fort Wayne Center. Students who later desire to continue toward a 4-year college degree may apply this 2 years of work toward graduation in the school or department of the university concerned.

The University has outlined a number of short curricula for students on the campus, and recently it has issued an announcement of new curricula for women. These curricula are used at the extension centers in advising students, but no special effort has been made to place students in them. The University has appointed a special committee on terminal curricula, which is now considering a policy for this form of service.

In general, not many extension students have regularly pursued the terminal curricula, for which there are several reasons. The Extension Division has not promoted such curricula strongly. Many of the students are looking forward eventually to completing 4-year curricula and obtaining degrees, and they have little or no interest in terminal programs short of 4 years. Numerous students are employed and want specific courses for particular purposes. Most of these do little long-term planning for their education. It is clearly apparent, however, to those in charge of the extension

work that short, well-organized programs have great merit, and there is a disposition to promote them for students who do not expect to take degrees. In the extension centers the University has the means of reaching large numbers of persons who could profit by vocational education of college grade. Many indeed are now pursuing such education in these centers but mostly without following curricula definitely arranged to achieve specific vocational objectives.

Enrollments.—During the year 1943–44 a total of 5,046 different students were enrolled in extension classes, all but 222 of them in the five centers. They registered for a total of 22,330 semester hours of credit. Of the number enrolled, 1,828 were men and 3,218 were women. A small number—228—of those enrolled were registered on a full-time basis. How many of these enrollees were pursuing vocational education of college grade is not known, but a study of enrollment figures indicates that the number was sizeable. Enrollments in accounting, shorthand, management, chemistry, composition, mathematics, and typewriting constitute a large proportion of the total. No doubt a goodly part of the persons enrolled in some of these courses, however, were pursuing college degrees rather than vocational objectives.

Financial support.—The extension work is supported largely by tuition fees at the rate of $5 or $6 a credit hour, depending on whether it is for undergraduate or graduate credit. The fees practically pay the cost of instruction not including the costs of overhead. The fees are somewhat higher than similar fees for instruction on the campus of the University.

Aim of the extension work.—One of the cardinal aims of the Extension Division is cooperation with State and local school authorities in developing their vocational education programs. The Division attempts to fill in any gaps that may exist by extending specific types of vocational training and by offering complementary programs in allied or cultural subjects. It also offers special advisory, informational, and other types of services to business and industry and to individual workers.

PENNSYLVANIA STATE COLLEGE EXTENSION PROGRAM, STATE COLLEGE, PA.

The extension services of Pennsylvania State College have been established to bring to interested citizens of the State opportunities for vocational, humanistic, and social education which are not open to them through the usual educational channels. The activities are carried on by many divisions of the College, and they are coordinated through an assistant to the President, in charge of extension. The part of the extension program described below is con-

cerned primarily with college grade vocational education of the technical institute type.

The College has claimed it a legitimate function of extension to publicize its educational offerings and services, and then to develop its program according to resulting interest and demand. Several of Pennsylvania's many industries asked for vocational instruction from the College several decades ago; consequently, extension instruction of this type has been offered for many years. The industrial nature of a community, its size, other educational opportunities available locally, and the interest of company management in extension instruction, have been determining factors in shaping these programs.

Branch schools.—In 1912 the School of Engineering at The Pennsylvania State College organized what is called a "Branch School" in Allentown at the request of a local committee of interested citizens. Similar technical schools were later established in four other cities, Scranton, Reading, Wilkes-Barre, and Erie. (A sixth school was established in Williamsport, but it was discontinued when industrial conditions in that center became such that it could no longer be supported.) All five schools continued operation up until 1941 when the Engineering, Science, and Management War Training Program, composed of short courses of college grade, displaced these technical schools and met existing wartime needs on a broader scale.

In these schools, terminal curricula in electrical, mining, civil, mechanical, aeronautical, and textile engineering, in air conditioning, and in business administration were variously given, depending on local needs. Instruction was offered in evening classes meeting two evenings each week for two terms anuually of 15 weeks each, or 80 nights per term. The curriculum extended over a 3-year period comprising a total of 540 class hours.

In the 1930's the standard fee for each of the 3 years of instruction was $30 to $36. Textbooks, drawing outfits, and similar supplies were purchased by the student in addition. Space for the schools was procured from local school authorities except in one center where classes met in the Y. M. C. A. building.

The schools were administered locally by carefully selected individuals. The teaching staff in practically all cases was qualified by practical experience as well as academic training. Subject-matter departments on the campus were frequently consulted by those administering the schools on matters of subject-matter quality and content, but funds available permitted little or no supervision of extension instruction by these authorities. Library materials were not supplied, though in later years visual aids consisting of films, slides, and charts were being used. Equipment was purchased

which demonstrated fundamental principles in mechanics, electricity, and other subjects. Frequent use for demonstration purposes was made of local industrial situations. Once each year, mechanical and electrical students spent a week end in College laboratories carrying out a series of tests prepared by College resident staff. As high as 100 students participated in these week end trips. Total enrollment of the five technical schools reached 550 to 850 students annually. Classes were small, consisting of not over 20 persons, and individual help and assistance to students was emphasized.

Practically all students registering for the curricula were high-school graduates, though others were accepted whose practical experience and ability enabled them to carry the work. Each student's qualifications were carefully judged in an individual interview. Students having completed elsewhere the equivalent of any subject in a curriculum were given credit for the course. Inasmuch as it was necessary to have some measure of the work, a system of "industrial credits" was used. Each point of industrial credit was equivalent to 15 hours of classroom recitation. Students completing a curriculum received an extension certificate. Grade reports were sent to employers at the end of the school year if the student so requested. Registration and opening dates of each school were publicized fairly widely in each individual center.

Typical branch school curricula.—The offerings of these technical schools were fitted to the community in which they were offered. For example, in Reading, a hosiery town, the textile course considered knitting with emphasis on hosiery manufacturing. In Allentown, which is a broad silk loom town, weaving and design of silk fabrics was stressed.

A typical curriculum in mechanical engineering in one of these technical schools follows:

FIRST YEAR

First Term	*Industrial credit*	*Second Term*	*Industrial credit*
M 30, Engineering mathematics	3	M 31, Engineering mathematics (Cont.)	3
D 14, Engineering drawing	3	D 15, Engineering drawing	3

SECOND YEAR

Mech. 12, Mechanics	2	Mech. 13, Mechanics (Cont.)	2
Mech. 32, Heat and thermodynamics	2	Mech. 33, Steam power equipment and internal combustion	2
B 60, English composition	2	B 61, Technical and business writing	2

THIRD YEAR

Mech. 22, Strength of materials	2	Civ. 18, Hydraulics	2
D 22, Kinematics	2	D 23, Machine design	2
Ind. 33, Industrial organization and management	2	Ind. 34, Industrial organization and management (Cont.)	2

This curriculum, somewhat general in nature, could lead to greater competence in occupations such as the following: Mechanical draftsman, detailer, or machine designer; power plant operator; supervisor of equipment maintenance; technical salesman; and supervisor of mechanical production.

Extension service in smaller communities.—University extension has, generally speaking, operated with an eye to the yardstick of student fees income. Budgetary considerations did not permit of technical schools being established in a large number of communities. They could be set up only in centers where enough students were interested year after year and where it was possible to have a regular annual enrollment of persons each paying approximately $35 in fees for such opportunity. In smaller communities the extension service offered a class center program with the declaration that where 15 or more students were interested in studying a certain course, it would be offered. Under this phase of the extension program, the College established classes in approximately 30 centers annually with a total class center enrollment which ran from 4,000 to 4,500 persons. A large number of these classes were vocational classes of college grade—the class center bulletin for Altoona in 1937 specifically listing the following subjects as ones commonly offered:

Accounting
Aeronautical drawing
Air conditioning
Airplane engines
Airplane performance
Blueprint reading
Business law
Corporation finance
Economics
Electricity
English
English in business practice
Heat and thermodynamics
Hydraulics
Industrial management
Kinematics
Machine design
Mathematics
Mechanical drawing
Mechanics
Public speaking
Radio
Refrigeration
Sociology
Strength of materials
Steam power equipment and auxiliaries
Stress analysis
Theory of aeronautics

Other characteristics of this class center program were outlined previously under the technical school program. In the larger centers it was possible for students to accumulate credits and com-

plete a curriculum such as was outlined above in mechanical engineering.

Management traning.—In yet another phase of the extension program, management training was offered. This instruction was supervised by three campus departments responsible for subject matter in industrial engineering, industrial psychology, and business administration. A staff of itinerant instructors taught persons in supervisory capacities, in company plants of Pennsylvania industries, meeting these groups usually on company time. This program reached about 8,000 persons annually.

ESMWT program.—In 1941, with a field organization acquainted with communities all over Pennsylvania and familiar with procedures necessary in establishing these vocational programs, there came not only the opportunity but the duty to train for war production under the free Engineering Defense Training Program. The result was a State-wide extension program (1941–45) of short courses of college grade in engineering, science, and management, which reached into 226 centers in Pennsylvania with a grand total of over 140,000 persons registered. A complete description of this program and of its operation may be found elsewhere. (See "University Extension and Postwar Education," by J. O. Keller and H. G. Pyle. *The Educational Record*, vol. XXIV, No. 4. pp. 386–398.)

Suffice it to say here that funds available for this program made it possible to enrich greatly the services from those offered earlier. An extension library of 30,000 volumes was circulated in packets to the various classes. Commercial laboratories were rented and extensive laboratory equipment was made available to the student some of which was in portable sets or kits. Mobile laboratories in chemistry and physics circulated among the centers. An extensive program of visual aids was developed. Early in the program, when a large number of unemployed registered for classes, a placement service operated for the purpose of placing students in positions for which they seemingly were fitted. Most significant of all, it was possible for resident departments to assume actual responsibility for preliminary approval of courses, preparing course outlines, selecting text material and teaching aids, approving part-time instructors to be employed, and, finally, to have representatives who actually supervised this extension instruction.

UNIVERSITY OF MINNESOTA, MINNEAPOLIS, MINN.

A number of factors have stimulated interest in the development of college-level terminal vocational curricula at the University of Minnesota. For some time the University has been concerned over the relatively large student mortality in 4-year programs, which has persisted even though progressively higher standards of selec-

tion have been applied. There has been also, in recent years, a growing realization of the necessity of training for semiprofessional or technician levels of employment.

Another factor has been the war. The defense program necessitated intensive short-term training to prepare people for immediate and effective participation in the war effort. As the war progressed, the needs of returning veterans stimulated the University to think in terms of programs with specific vocational applications and of shorter duration than the traditional 4-year curricula.

Technical curricula.—Programs developed at Minnesota serve a wide variety of occupations in the areas of the applied technical, semiprofessional, and business and public service fields.

The Institute of Technology, which embraces the various schools of engineering of the University, has developed a number of 2-year courses, the completion of which leads to the certificate of Technical Aide. The courses are designed for those who do not wish to spend four academic years to prepare themselves as professional engineers, but who can spend two years in preparation for technical work of a professional nature. The instructional material has been selected and arranged to provide the best possible preparation for such positions. Although the work is just as intense as that given in the professional engineering courses and requires equal application on the part of the student, the material taught is narrower in its scope and is pointed more directly toward practical applications.

The work offered qualifies for five major occupations: (1) Chemical Analyst, to prepare the student for laboratory positions in industry and commercial chemical laboratories; (2) draftsman, to prepare students for drafting room work in industries, engineering offices, and offices of contractors, builders, architects, etc.; (3) maintenance and operation, to prepare students for employment in the operation and repair of equipment or as aides in the engineering offices of manufacturers of such equipment; (4) production, to prepare students for minor supervisory positions in manufacturing plants or as aides in production engineering offices; and (5) general construction, to prepare students for office and field work in the building and contracting industries, railroad and highway construction and maintenance, public works departments and engineering aide work in the offices of consulting engineers. Eleven 2-year curricula, preparing for employment in the above fields, are offered.

Curricula for health services.—In semiprofessional fields, there are curricula in the areas of dental hygiene and nursing. The 2-year course for dental hygienists is offered to young women only and leads to the degree of Graduate Dental Hygienist. Admission is based upon the completion of the 4-year high-school course with the same scholarship averages required for admission to the Col-

lege of Science, Literature, and the Arts. The course was established primarily to fill the need for workers in public schools, hospitals, and dental offices, to do dental prophylaxis work, and to teach dental hygiene, which is recognized as being one of the great health services of the times. The course includes training in all branches of dental office assisting and makes graduates easily adaptable to the general and special needs of the private dental offices, should that be the field of work selected. Graduate dental hygienists are now licensed in 34 of the States and are also employed by the Dental Corps of the Army, Navy and public health branches. They must always be under the supervision of licensed dentists and they may not practice independently.

Programs for business and service occupations.—Programs for business and service occupations are offered in the General College, the School of Business Administration, and the Extension Division. Vocational sequences in the General College are made up of a combination of courses providing a broad background of general education supporting more practical courses to qualify students for employment in semispecialized occupations for which 2 years of college education is sufficient. In some instances, however, additional specialized training is desirable. Illustrative vocational sequences are:

CHILD CARE.—The program serves as a try-out of interests and abilities for work with children. With additional work of a technical character, it leads into the fields of early childhood education, nursery school and kindergarten teaching, clinical work with children, assistantships in agencies and institutions dealing with children such as day nurseries, settlement and neighborhhod houses, child guidance centers, etc. It is of value also to girls working in homes with young children and as preparental training.

COMMERCIAL ART.—The program is planned to provide the fundamental subject matter upon which further specialization is based. It combines theoretical background with practical experience in design and execution and familiarity with common and newest techniques. It leads toward work in commercial arts, fashion illustration, or textile or industrial design with some flexibility in choice of courses depending on the exact nature of individual differences.

GENERAL CLERICAL.—The program is planned to provide for a large group of clerical occupations which require broad training. Such occupations are concerned with the preparation, transcribing, systematizing, and preserving of written communications and records in offices, shops, and retail establishments. These include account and loan analysts, estimators, dispatchers, cashiers, checkers, tellers, tracers, paymasters, and adjustment, bookkeeping, correspondence, information, statistical, and traffic clerks. Specialization, where

desired, is usually done on the job or in private schools. The retailing and sales program, a related field, is described in detail below.

The School of Business Administration made available a number of 1-year special war courses for women, starting in January 1943. These courses were open to women having the requisite aptitudes and abilities, regardless of preliminary academic training. The fields for which training was offered on this basis were for positions in: (1) Industrial production; (2) industrial relations and personnel departments; (3) accounting; (4) office management and secretarial work. There was no implication that these programs were to be continued after the war, although the School has a 3-year curriculum leading to a certificate in business administration as a regular part of its offering. The Extension Division of the University also offers a 45 quarter-credit program leading to the Extension Junior Business Certificate and a 90-credit program leading to the Extension Senior Business Certificate.

Other terminal programs.—The staff of the College of Agriculture, Forestry, and Home Economics has approved in principle the idea of vocational curricula of less than four years in length. The various divisions of the college have been authorized to study the possibilities of and to arrange such courses for ex-servicemen and women leading to specific vocational objectives. As recommended by the University Senate, normal prerequisites are to be waived for regular courses for such students who have the requisite ability and who pass special examinations as required by the divisions concerned.

The terminal curricula of the College of Science, Literature, and the Arts are in the field of liberal and general studies rather than vocational training. It is quite possible, however, to work out certain course grouping for individual students who have a definite occupational aim for which fewer than four years of preparation would be sufficient.

Illustrative curriculum for industrial production.—The curriculum for industrial production is a representative example of the 2-year technical programs in the Institute of Technology. The requirements for admission to all these programs are the same as for regular freshmen entering the Institute, namely, a rank in the upper 60 percent of the high-school graduating class, with a specific range of subjects, which should include higher algebra and solid geometry. Students lacking these mathematics courses may make up their deficiency during their first quarter in residence, but without University credit. Students who have pursued courses of study in other colleges of recognized standing may receive advanced credit under the rules of the University and of the Institute. Completion of the first two quarters of the regular program with satisfactory grades

in all subjects will qualify students to transfer to the professional 4-year courses with full credit.

The basic courses in the first year are practically the same for all Technical Aides, with the applied courses in the second year grouped to satisfy specific objectives. The standard unit of credit is the point. One point is supposed to require three actual hours of the average student's time per week in lecture, study, or laboratory. The specific subjects which make up the program are as follows:

First 3 quarters	*Points*
Mathematics	15
Composition, speech, etc.	9
Chemistry	8
Drafting	9
Orientation	0
Physics (Mechanics and heat)	4½
Shop	2
Total	47½

Fourth quarter	*Points*
Industrial electricity	4
Machine tool utilization	3
Mechanical movements	3
Physics (electricity and light)	4½
Engineering materials	3
Total	17½

Fifth quarter	
Production illustration	2
Motion and force analysis in machinery	2
Heat power principles	4
Metal processing	2
Production supervision	2
Engineering problems	3
Technology and social change I	3
Total	18

Sixth quarter	
Motion and time study	3
Plant layout	3
Production control	3
Tool and gauge inspection	2
Human engineering	3
Technology and social change II	3
Total	17

Illustrative curriculum in retailing.—The retailing program in the General College may serve to illustrate another type of vocational curriculum. The aim is to give students a broad general background and at the same time to give them courses having a general application to business occupations which stress meeting and dealing with people, with further and more specialized study and experience directly related to retail selling. The program is also aimed at helping students to develop versatility and adaptability.

Selection of students for the retailing program is made very carefully, and the number is limited. In general ability the students should rank in the top third of those enrolled in the college. They must have an interest in the field both in the terms of their own claimed interest and that measured by the Strong vocational interest scales. They should stand above the sixty-fifth percentile on "personality-for-sales" tests, and should be approved by a counselor on terms of appearance, manners, dependability, and social competence before they are admitted to the sequence.

The following General College courses, with their respective credits, are required: Vocational orientation, 6; problems of contemporary society, 5; business letters and reports, 3; speech laboratory, 3; clothing selection, purchase, and care, 3; practical applications of psychology, 5; government studies, 6; our economic life, 6; formation of public opinion, 3; mathematics of business, 6; and retailing and selling, 5; total, 51 credits.

The following courses, with their respective credits, offered in other colleges of the University, are also required: Statistics, 5; accounting, 3; business law, 6; and textiles, 3; total, 17 credits.

The cooperative work program, which provides a form of internship, is now being developed experimentally. Contacts have been established with key personnel in department stores in the Twin Cities, to facilitate the planning and operation of this program. Credit is given for supervised retailing experience, which will be coordinated with the classroom work so that the students may spend their mornings in class, for example, and a minimum number of hours per week in actual selling during their last two or three quarters in residence in the college. The University is ideally located for such an arrangement, since it is almost midway between Minneapolis and Saint Paul. The remainder of the 90 credits required to complete the program and the requirements for the associate in arts degree may be taken as electives chosen under the guidance of a faculty adviser. The program is still in the experimental stage, but the trend in this direction seems promising.

UNIVERSITY OF NEBRASKA, LINCOLN, NEBR.

The University of Nebraska, through the Junior Division and with the cooperation of the undergraduate colleges, has organized and placed in operation a number of 2-year vocational programs. It is the opinion of the sponsors that such courses of study should be made available in order to meet the needs of students whose interests and achievement records in secondary schools indicate probable success in work of college grade but who may not be able to remain in college for the completion of baccalaureate degree requirements.

The basic premise on which these programs have been built was clearly stated by Chancellor C. S. Boucher:

> There should be provided for every young person the opportunities and facilities appropriate and necessary for him to become the happiest and most useful citizen that it is possible for him to become. To this end, however, it is necessary to provide a greater variety of types and lengths of training programs than is now generally provided.[1]

[1] C. S. Boucher, "Some Current Educational Problems and Some Possible Readjustments—Vocational Completion Courses at High-School and Junior-College Levels," Mar. 31, 1930.

Guiding principles.—The 2-year programs were developed by faculty committees appointed for that purpose by the college deans and the Dean of the Junior Division acting jointly. These committees agreed at the outset that the programs should be organized in the light of a few guiding principles, among them, the following: (1) Registration would be open only to students who could meet the regular admission standards of the University; (2) the initial achievement and guidance tests would be identical with those given students who were enrolling for 4-year programs, but additional vocational and aptitude tests could be, and in many cases would be, required of those who desired particular 2-year vocational programs; (3) college standards of proficiency in English usage would be required; (4) approximately 25 percent of the course requirements should be of nonvocational or general education type; (5) about 40 to 50 percent of the required course hours should be along the line of the student's special interest; (6) much flexibility should be allowed in arranging details; each student should have a personal faculty adviser who would have the responsibility of arranging details of the program in cooperation with the Guidance Consultant of the Junior Division.

General characteristics of curricula.—The 2-year programs thus far organized represent a serious attempt to provide opportunities for students to develop skills in the respective fields while retaining in some measure the ideals of cultural progress. Isasmuch as one of these programs is a streamlined course in general education wherein the direct objective is to develop in the student an appreciation of culture rather than the attainment of skill, that one should not be termed vocational. While the other programs emphasize definite vocational training, they include many elements of general education. These are well represented by the curricula in secretarial work and in radio announcing and broadcasting. In agriculture the work is quite distinctly vocational and offers training for such varied interests as poultrymen, nurserymen, feed dealers, hardware dealers, and practical farmers.

In home economics only one basic terminal curriculum is offered. The general education aspect includes 6 semester hours in English usage and similar time allotments in the social sciences and in the physical or biological sciences, a total minimum of 18 college hours in addition to the 4 hours of physical education, thus making a total of 22 out of the required 64 credit hours in a 2-year program. At least 25 semester hours must be devoted to courses in home economics, and these may be selected out of any offerings for which the student is eligible, thus leaving a possibility of about half of the program to be chosen as electives under the guidance of the student's adviser.

In business there is a somewhat similar combination of basic work

in theory and general education, with such emphasis on the practical as will lead to some degree of competency in one of the specific fields, such as accounting, advertising, insurance, retailing, or general business.

In engineering there are five 2-year curricula that are termed subprofessional. However, the freshman year in these curricula is virtually the same as the freshman year of the regular 4-year programs. In mechanics, however, full emphasis is given to the vocational possibilities of concentration in such areas as engineering drawing, woodworking, forge work, machine tool practice, surveying, and laboratory work in farm machinery, motors, tractors, trucks, and automobiles.

Two-year courses in secretarial work and in radio announcing and broadcasting require approximately one-fourth of the student's time to be devoted to English usage, including speech, and to the social sciences. About 50 percent of the student's time is devoted to concentration on the skills required in the several fields of radio practice and the remaining 25 percent comes under the heading of electives to be chosen under the guidance of the student's personal adviser.

Curricula in radio broadcasting and mechanics.—The detailed provisions of a program deemed to be typically vocational, such as the curriculum in radio announcing and broadcasting, may be of interest. In this program during the freshman year the required subjects are English composition, 6 hours; fundamentals of speech, 6 hours; introduction to business administration, 2 hours; news writing and reporting, 3 hours; radio announcing and broadcasting, 4 hours; military science of physical education, 2 hours; thus leaving 7 hours out of the 32 available as electives. In the second year, English usage is continued with 4 to 6 hours required, unless the student can pass rather stiff comprehensive examinations in that field, and Speech continues with a requirement of 4 hours, radio program production, 6 hours, military science or physical education, 2 hours, thus leaving 15 or 16 hours open for electives under the guidance of the adviser. The type of electives chosen to fill out the program is in response to the student's needs as indicated by his record in high school, college, and in the testing program. Thus far the demand for students who have completed this course has far exceeded the available personnel.

Another illustration of a curriculum primarly vocational is offered from the field of mechanics. In this program the required work is almost exclusively English composition, mathematics, physics, and engineering drawing. The electives are chosen from the realms of applied mathematics, including drawing, woodworking, and metal work, or from the field of machine tool practice or the various aspects of engineering materials and farm motors and farm machinery.

In all of these programs the goal sought is the attainment of such skill in some one line as will enable the student to work constructively on a labor scale that will give him a decent living, and that will also provide some of the phases of education deemed valuable for intelligent citizenship.

Secretarial curriculum.—The junior secretarial curriculum has been widely accepted by students, and evidently meets a distinct need in the terminal field in this university. It is given here in detail because it illustrates the division of work and the type of organization that characterize the 2-year curricula.

FIRST YEAR, 1ST SEMESTER

	Hours
English composition	3
Elementary typewriting	2
Introductory accounting	3
Orientation 1	0
Military science or physical education	1
Electives	7
	16

SECOND YEAR, 1ST SEMESTER

	Hours
English	3 or 0
Advanced typewriting	2
Applied shorthand theory	3
Military science or physical education	1
Electives	7 or 10
	16

FIRST YEAR, 2D SEMESTER

	Hours
English composition	3
Elementary shorthand theory	5
Intermediate typewriting	2
Military science or physical education	1
Electives	5
	16

SECOND YEAR, 2D SEMESTER

	Hours
English	3 or 0
Advanced shorthand	3
Office machines	2
Business law	3
Military science or physical education	1
Electives	4 or 7
	16

SUGGESTED ELECTIVES

	Hours		Hours
Accounting	3	Contemporary institutions	6
An introduction to teaching	3	Principles of economics	6
Economic geography	6	Office management	2
Mathematics in business	3		

Students may choose, as electives, any courses for which they are qualified at the time of choice. Those who have had typewriting or shorthand in high school or elsewhere are given proficiency tests on the basis of which they are admitted to the advanced courses suitable to their needs. This procedure releases additional credit hours as electives for those who enter with meritorious high-school preparation in commercial arts.

Guidance and academic recognition.—The programs of study for individual students are made out under the guidance of competent advisers and are designed to represent sequences educationally and

vocationally sound. The recommended programs must be approved by the counselor concerned and by the dean of the junior division.

All who express an interest in or a preference for a 2-year curriculum are given special aptitude tests and, in the light of the results, the situation is fully discussed with each student. The advantages and disadvantages, the favorable and unfavorable factors that appear to exist, are carefully and frankly presented as information that will help the student to make an intelligent choice.

At the completion of a 2-year program, the degree of associate in a specific field is awarded in connection with the regular graduation exercises of the University. The standards of instruction and grading that prevail in the 2-year programs are identical with those used in the 4-year curricula.

Special problems being studied.—It is recognized at Nebraska that the strict maintenance of competency as a required standard in both the 2- and the 4-year programs fails to meet the needs of a group of students who succeed in passing high-school requirements but who lack the preparation, or perhaps the ability, to make good on the level implied by the term "college standards." The question of where and how to provide for students mechanically adept but, from the traditional point of view, intellectually backward, has not been fairly met. The trade school in its ordinary sense develops mechanical skill quite efficiently but it fails to bring the mind of the student beyond the workbench into the realm of socialized living. Perhaps the college should meet the trade school somewhere on middle ground and thus provide opportunity for those who are mechanically inclined to supplement their training in college with academic courses on a broader basis than is usually true in the comparatively narrow and closely limited fields that ordinarily pose under the guise of departments. This problems is being studied but to date no action has been taken.

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