

ABSTRACT OF THESIS

PRE-ENGINEERING AND TECHNICAL SERVICE
CURRICULA, BASED ON THE VOCATIONAL
INTERESTS OF HIGH SCHOOL
BOY STUDENTS

Submitted by
Vaden H. Stroud

In partial fulfillment of the requirements
for the Degree of Master of Science
Colorado State College
of
Agriculture and Mechanic Arts
Fort Collins, Colorado

S-1-08A-18-01-019

AUGUST, 1940



U18400 9073050

COLORADO STATE COLLEGE OF A. & M. A.
FORT COLLINS, COLORADO

PRE-ENGINEERING AND TECHNICAL SERVICE CURRICULA, BASED
ON THE VOCATIONAL INTERESTS OF HIGH SCHOOL BOY STUDENTS

ABSTRACT

The junior college has, in such a state as Kansas, remained primarily a community institution, though drawing students from the surrounding trade territory. The present study dealing with the Hutchinson Junior College, located at Hutchinson, Kansas, is an attempt to find what curriculum changes would be desirable that would permit it to act as a better training place not only for those young people of the community who would go on with professional training in the four-year college or university, but also for those needing courses on the college level but who would profit best if those courses were of a terminal nature. For convenience the problem considered has been limited to a study of the curriculum possibilities that exist along pre-engineering and technical service training lines as they relate to occupations primarily open only to men.

The problem.--The problem undertaken has been:

What should constitute the pre-engineering and technical service curricula that can be recommended for the Hutchinson Junior College, based on the vocational interests of high school students?

Subordinate questions to be answered are:

1. What are the occupational intentions of the boys of the Hutchinson High School and how are these related to the desirability of offering pre-engineering and technical service courses in the Junior College?

2. What are the occupations represented in the community and how are these related to the present educational program of the Junior College and to the proposed program?

3. What subjects should be added to the present Junior College curriculum to meet most nearly the requirements of the first two years of the four-year engineering institutions?

4. What subjects should be added to the present curriculum along technical service lines which could be defended on the basis of cost and service to the largest number.

By a pre-engineering curriculum is meant those courses required in the first two years of the four-year institution, which, given in the Junior College, will meet the four-year institution requirements. By a technical service curriculum is to be

understood those related courses which are designed to meet the training needs of occupational fields that have standards of competence considerably above those developed by present high school and trade school training but below that developed by the four-year professional schools; some writers in the junior college field use the term "semi-professional" for such offerings.

At the present time (1939) Hutchinson Junior College has an enrollment of approximately 450 students with courses in English, modern languages, mathematics, physical sciences, biological sciences, philosophy, education, music, home economics, drawing, typing, and accounting. No shop subjects or surveying are offered. While the term "engineering" appears in the catalog the reference is to a curriculum of academic subjects with elementary and machine drawing, and descriptive geometry.

Methods and materials.--Data were gathered from several sources. One source was that of 300 boys of the Hutchinson High School. Since the problem involved pre-engineering and technical service courses, only those boys were used who had taken at least one industrial subject; 276 of the 300 had taken at least two such subjects.

Three groups were used, each consisting of 100 boys. One group included boys who were good in both academic and industrial subjects--each person having an academic average not lower than 2.68, in which A counted as 1, B as 2, and C as 3, etc., and an industrial average not lower than 2.26. A second group who were inferior, in general, to the first were better in academic than industrial subjects-- with minimum averages of 3.24 and 3.80, respectively. The third group were relatively inferior in academic but relatively satisfactory in industrial subjects--with minimum averages of 3.66 and 2.92, respectively. The particular limits were chosen to permit each group to have 100 boys. The use of such groups was to enable the writer to throw light upon the college plans of boys of diverse type and to determine whether the boys of any particular group were finding the present junior college program of little value to them in their occupational intentions.

These boys in the spring of 1938 were asked to fill out a questionnaire in which the high school subject of special interest and the occupation they intended to follow were to be written in and an indication given as to whether they thought college training was of value for their selected vocation. What their college plans were and whether they would go to the

local Junior College or not, either as it was or if it offered courses of a semi-professional or technical nature, were also asked. It was further asked whether going to college would probably require financial aid from some other source than that of the family. Of the 300 boys who filled in the questionnaires, 74 were sophomores, 131 were juniors, and 95 were seniors.

Data were transferred to tables and kept separate for the three school-achievement groups.

Analysis of data received from high school boys.--Data from the boys were analyzed to answer the following questions:

1. What are the occupational intentions of the high school boys?

2. What is the relation between the occupational intentions of these boys and their college plans?

3. What per cent of the boys are planning to go to college:

(a) to a four-year college only;

(b) to a junior college and then to a four-year college;

(c) to junior college only;

(d) to junior college if pre-engineering and technical service courses are offered?

4. How large a number of the boys are giving as occupational intentions those occupations for which pre-engineering, or technical service courses would furnish training?

5. Are there financial conditions which would definitely affect the college plans of a portion of the high school group?

The findings of the present study in connection with these questions will be briefly summarized.

Of the 300 boys, 152 indicated that they were especially interested in some industrial subject given in high school, such subjects having major interest for from 37 to 60 per cent of the three school-achievement groups.

As to occupational intentions only 27 of the 300 wrote "undecided" or left the question blank. In connection with the occupations written in by the boys a classification was made according to the Brussel's Revision of the Barr-Taussig Scale (38). Of the 300 boys, 67 gave occupational intentions that came under the professional classification. Of these, 57 were interested in some phase of engineering of which 14 fields were represented. The boys represented were largely drawn either from the school-achievement group that was good in both academic and industrial subjects, or from the group inferior in academic but

relatively good in industrial subjects. Of the 57, 43 were planning to go to college for four years, with 24 of these planning to go to junior college first. Of the rest, 7 were planning to go to junior college only, while 5 were interested in attending junior college if semi-professional courses were given.

A total of 116 boys selected occupations that were considered to involve the possibility of technical service training on the part of the junior college. The following are the occupations chosen by three or more of the boys: agriculture and farming, 29; general mechanics, auto mechanics, and airplane mechanics, 24; architect and drafting, 7; refrigeration and air-conditioning, 4; aviators and pilots, 7; machinists, 3; and teachers of industrial arts, 3. Of the 116, 62 were planning to attend junior college and 31 more would go if the mentioned courses were offered. Of the 23 undecided about going to college, two-thirds had been especially interested in some industrial subject in their high school work.

Of the full 300, 100 planned to go to junior college and then to some four-year college, 64 more expected to go to junior college only, and an additional 51 would go to junior college if the courses mentioned were offered; this represents a total of 215, or 71.6 per cent of the entire group. As to grade averages, those planning to go directly

to a four-year college were slightly inferior to either the group planning to attend junior college first, or those going only to the junior college, but superior to the group who would go to junior college with certain courses offered, and definitely superior to the undecided group.

Implications of the findings.--The following implications are indicated as to a pre-engineering curriculum for the Hutchinson Junior College:

1. The Junior College would be justified in introducing a pre-engineering curriculum on a professional training level provided it can be shown that a composite course can be developed that would meet the needs of several engineering fields.

2. There would be an advantage in having courses of a terminal nature giving semi-professional training introduced in the Junior College program for those whose training should be on a lower professional level.

The following implications are indicated in relation to technical service courses:

1. Taken in connection with the semi-professional implication previously given,

the Junior College would be justified in introducing courses in its curriculum which would offer training on a terminal basis for agriculture and farming, mechanics, drafting, and junior engineers.

2. These courses should be presented on a semi-professional, college level.

Training needs from standpoint of community occupations.--To indicate whether the occupational intentions of the boys were in line with the training needs as represented by the occupations of the community the types of occupations of the community were determined by listing those given for the different people of the city directory, classifying the occupations according to the Brussel's Revision of the Barr-Taussig Scale (38), and determining those which would involve technical service training such as the Junior College might offer. The particular occupations so found accounted for a total of 1679 employed people. These occupations corresponded closely, in general, to those which the boys stated that they intended to follow and so gave extra support to the implications previously listed.

A pre-engineering curriculum.--To determine whether a pre-engineering curriculum could be developed which could act as a composite course and would meet

the several engineering fields, the writer secured catalogs of eight four-year engineering institutions and investigated the courses offered in nine engineering fields. In terms of all fields of engineering the highest frequency for shop courses were for machine shop, forging welding, pattern making, and foundry practice.

By comparison of the courses offered in civil, electrical, agricultural, and mechanical engineering in four institutions either of Kansas or immediately adjoining states and comparing them with what was already available in the courses of the Hutchinson Junior College, it was shown that a pre-engineering curriculum to meet the needs for these engineering fields could be met by adding machine shop, oxyacetylene and arc welding, forging, surveying, and engineering lectures to the present Junior College program. Costs for shop equipment for classes of 15 persons were secured for the subjects listed.

Technical service courses.--To determine the possible courses for technical service courses given on a semi-professional basis along the lines of agriculture and farming, mechanics, and drafting (to include architecture), the writer secured catalogs of ten junior colleges offering semi-professional

courses along such lines. A comparison of the courses, taken in connection with shop requirements previously assigned to the pre-engineering curriculum, indicated that a course for the three semi-professional lines mentioned above could be developed that would involve no additional shop equipment costs. These courses would include offerings in English, mathematics, science, drawing, surveying, shop subjects, related subjects, and physical education.

LIBRARY
COLORADO STATE COLLEGE OF A. & M. A.
FORT COLLINS, COLORADO

T H E S I S

PRE-ENGINEERING AND TECHNICAL SERVICE
CURRICULA, BASED ON THE VOCATIONAL
INTERESTS OF HIGH SCHOOL
BOY STUDENTS

Submitted by
Vaden H. Stroud

In partial fulfillment of the requirements
for the Degree of Master of Science
Colorado State College
of
Agriculture and Mechanic Arts
Fort Collins, Colorado

August, 1940

LIBRARY
COLORADO STATE COLLEGE OF A. & M. A.
FORT COLLINS, COLORADO

378.788
AO
1940
25-

COLORADO STATE COLLEGE

OF

AGRICULTURE AND MECHANIC ARTS

June 20 1940

I HEREBY RECOMMEND THAT THE THESIS PREPARED UNDER MY SUPERVISION BY VADEN H. STROUD

ENTITLED PRE-ENGINEERING AND TECHNICAL SERVICE CURRICULA, BASED ON THE VOCATIONAL INTERESTS OF HIGH SCHOOL BOY STUDENTS BE ACCEPTED AS FULFILLING THIS PART OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF SCIENCE

MAJORING IN TRADE AND INDUSTRIAL EDUCATION

CREDITS 3.5

J.B. Youngling
In Charge of Thesis
J.B. Youngling
Head of Department

APPROVED

Recommendation concurred in

Committee on Final Examination

Committee on Graduate Work

J.B. Youngling
George H. Henry
D.H. Morgan
Carl V. Nimbroman

Alvin Heger
L. W. D. D. D.

This thesis, or any part of it, may not be published without the consent of the Committee on Graduate Work of the Colorado State College of Agriculture and Mechanic Arts

CONTENTS

| | Page |
|---|------|
| ACKNOWLEDGMENT - - - - - | 6 |
| CHAPTER I: INTRODUCTION - - - - - | 7 |
| CHAPTER II: REVIEW OF LITERATURE - - - - - | 11 |
| CHAPTER III: METHODS AND MATERIALS - - - - - | 17 |
| CHAPTER IV: NEEDS FOR TRAINING COURSES FOR PRE-ENGINEERING, AND TECHNICAL SERVICE OCCUPATIONS | |
| The grade-distribution of the groups studied and the high school subjects of major interest - - - - - | 25 |
| Needs for additional training from the standpoint of high school pupils - - - - - | 30 |
| Needs for additional training from the standpoint of the occupations represented in the community - - - - - | 66 |
| CHAPTER V: NATURE OF PRE-ENGINEERING CURRICULUM FOR THE HUTCHINSON JUNIOR COLLEGE - - - - - | 70 |
| CHAPTER VI: NATURE OF TECHNICAL SERVICE COURSES FOR THE HUTCHINSON JUNIOR COLLEGE - - - - - | 81 |
| CHAPTER VII: LIMITATIONS AND OTHER PROBLEMS - - - - - | 92 |
| CHAPTER VIII: SUMMARY - - - - - | 94 |
| APPENDIX AND BIBLIOGRAPHY - - - - - | 101 |

LIST OF TABLES AND FIGURES

| Table | Page |
|--|------|
| 1. Distribution of 300 high school students on basis of school achievement groups and subject interest in high school - - - - - | 29 |
| 2. Occupational intentions of 300 high school students as related to school achievement groups, and reaction as to value of college for selected vocation - - - - - | 32 |
| 3. College plans of 300 high school pupils in relation to occupational intentions and school achievement groups - - - - - | 41 |
| 4. Intentions in regards to college of 300 high school students, as related to school achievement - - - - - | 52 |
| 5. Occupational intentions as related to pre-engineering in relation to junior college possibilities - - - - - | 54 |
| 6. Occupational intentions related to technical service in relation to junior college possibilities - - - - - | 55 |
| 7. Subject interest in high school of 47 high school students that are undecided or do not plan to go to college - - - - - | 57 |
| 8. Occupational-intention groups and grade average of 47 high school students that are undecided or do not plan on going to college - - - - - | 58 |
| 9. Financial status in regard to outside help, and family income of 138 high school pupils with four-year college intentions, in relation to school-achievement groups - | 60 |
| 10. Occupations in Hutchinson, Kansas, related to pre-engineering and technical service training - - - - - | 67 |

LIST OF TABLES AND FIGURES (continued)

| Table | Page |
|--|------|
| 11. Engineering fields represented in the courses of eight colleges and universities - - - - - | 72 |
| 12. The frequency of required shop subjects in relation to engineering fields, for eight colleges and universities - - - - - | 73 |
| 13. Subjects of first two years of civil, electrical, agricultural, and mechanical engineering courses of four selected institutions as related to present Hutchinson Junior College program - - - - - | 76 |
| 14. Semi-professional courses offered by ten junior colleges - - - - - | 82 |
| 15. Subjects in mechanical, drafting (with architecture), and agricultural courses given in selected junior colleges - - - - - | 86 |
| Figure | |
| 1. Distribution of school achievement groups - - | 27 |

ACKNOWLEDGMENT

The writer wishes to express his appreciation to the following members of the Colorado State College summer faculty: to Mr. J. B. Yingling, his major professor, and Dr. G. L. Betts, Supervisor of Graduate Research; to Mr. P. G. Frasier, for suggestions in the early stages of the study; and, especially, to Mr. K. G. Irwin, his thesis advisor, for guidance and counsel.

He wishes also to express his appreciation to school administrators and their secretaries in the Hutchinson, Kansas, school system for assistance in gathering data.

7

PRE-ENGINEERING AND TECHNICAL SERVICE CURRICULA,
BASED ON THE VOCATIONAL INTERESTS OF HIGH SCHOOL
BOY STUDENTS

Chapter I
INTRODUCTION

The junior college is not a new institution in American education. It has not, however, reached that point of relative maturity in which a standardization of curricular offerings exists. To a much greater degree than is the case with the four-year college, the junior college is in a state of plastic change; certain changes in both its immediate objectives or the means used for carrying through those objectives can still be expected.

In its early development the course of study that was given was always modeled after that of the four-year college or colleges which dominated the general area. The main concern of the officials of any junior college of that period of development was whether the local graduates would be able to enter the state colleges on a credit-for-credit basis. It was evident, even from the beginning, that courses designated almost solely

for entrance to the junior year of the four-year college were not, of necessity, those which would be of the greatest value to those not continuing their college work beyond the junior college. There has come an increasing recognition, also, of the need of training on the college level for those not entering the professions. An example of the need of such training is represented by that of the junior engineer and, in the absence of other training agencies, it seemed logical that the junior college should undertake such training. This the college apparently could do by adding to the pre-engineering training courses such other courses as would be terminal in nature and particularly designed to meet the needs of those whose goal was not that of professional training.

To suggest that a particular junior college should undertake such an enlarged program as that suggested would not mean that each and every junior college should do so. The present study has had as its objective to determine whether the Hutchinson Junior College of Hutchinson, Kansas, should offer pre-engineering and technical service curricula as they relate to occupations open primarily to men only; and, if so, what should be the nature of such curricular offerings.

Background of the problem.--The Hutchinson Junior College is one of a group of Kansas junior colleges

that is entirely supported by community taxation and, while closely affiliated with the Kansas State University and Kansas State College, is free to add to its own curricular offerings.

The enrollment of the institution in 1938-39 was approximately 450 students (19). Courses are offered in the following groups: English, modern languages, mathematics, physical sciences, biological sciences, social sciences, philosophy, and professional. Under the heading of professional are included such diverse courses as education, music, home economics, drawing, typing, and accounting. No shop subjects or surveying are offered. While the term "engineering" appears in the catalog, the reference is to a curriculum of academic subjects with elementary and machine drawing, and descriptive geometry.

The problem.--Specifically, the problem of the present study has been to determine an answer to the following:

What pre-engineering and technical service curricula can be recommended for the Hutchinson Junior College, based on the vocational interests of high school students?

In connection with the main problem question the answers to several subordinate questions have been sought:

1. What are the occupational intentions of the boys of the Hutchinson High School and how are these related to pre-engineering and technical service courses?

2. What are the occupations represented in the community and how are these related to the present educational program of the Junior College?
3. What subjects should be added to the present Junior College curriculum to meet most nearly the requirements of the first two years of the four-year engineering institutions?
4. What technical service subjects should be added to the present curriculum and defended on the basis of cost and service to the largest number?

Definitions.--In connection with the present problem certain terms have been used. For the sake of clarity these terms will be defined; both are used, with specific meanings, by junior college writers.

By a pre-engineering curriculum is meant those courses required in the first two years of the four-year engineering institution which, given in the junior college, will meet the four-year institution requirements.

A technical service curriculum is intended to mean those related courses which are designed to meet the training needs of occupational fields that have standards of competence considerably above those developed by the four-year professional schools. Some writers in the junior college field use the term "semi-professional" for such offerings.

A review of current literature indicates some of the more recent trends in curriculum offerings along the lines of the problem of the present study.

Chapter II

REVIEW OF LITERATURE

Since the present study deals with curricular offerings designed, primarily, to meet the needs of those not continuing their college work beyond that of the junior college, certain research studies along such lines will be reviewed.

W.C. Bells (14) in 1935 reported a survey of 6962 California junior college students. He found that only slightly over half of the number entering the junior college graduated. Approximately one fourth of the junior college students went on to an advanced institution, while one out of every eight of the students entering the junior college graduated from a four-year institution.

As a result of his study he gave the following findings:

1. The junior college, far more than commonly supposed, is a terminal institution for a large percentage of its student body.
2. Much more attention should be given to devising, perfecting, and popularizing suitable terminal curricula, both of the semi-professional or technical type and of the general civic, cultural, or social intelligence type.
3. Higher educational institutions should consider the desirability of a relaxation in the rigidity in their entrance requirements, for

junior college graduates.

Eells states,

It is educationally wasteful and socially undesirable to compel students to take prescribed courses of study for transfer if more than two-thirds of them, regardless of their good intentions, fail to enter the institution for which their courses of study prepared them. The higher institution probably would secure a better class of students if they would emphasize more the quality of work done by the junior college student rather than the particular pattern of that work.

Snyder (9) writing in 1930 criticized the curricula of the junior colleges of that time as being simply a duplication of the courses given at the university:

There is no attempt in these courses to meet the needs of the non-academic students nor in any way to adjust the students to the social, economic, or industrial environment of the community.

That this situation did not continue is indicated by Barton (2) who stated in 1935 that while the junior colleges still kept the preparatory courses foremost in their offerings there had been a decided emphasis upon vocational and pre-professional education. "Semi-professional courses are on the increase in practically all types of junior colleges."

Davis(9) summarized the situation as it appeared in 1936. He stated that two distinct functions had developed, one to provide special vocational and semi-technical training for the large group of young men and women who would not attend college beyond the

junior college period, and the other giving more traditional training for advancement into the specialized fields of the university and senior college.

The need for training along semi-professional lines was stressed by Proctor (30) who stated that in 1935 only a few junior colleges out of 490 then in existence offered any semi-professional technical or terminal courses. He laid the blame not so much upon the junior colleges as upon the students who, he says, are unduly ambitious to enter the learned professions: "The situation is a hangover from the aristocratic traditions in occupations, and only a few junior colleges are bold enough to defy the traditions."

That there was another side to the situation as it related to terminal courses of a semi-professional nature, was shown by Eells (15) who found in 1938 that the junior college graduates of many semi-professional courses had found the doors of the university closed to them in case they wished to continue with professional work:

In the past two or three years, however, a considerable number of universities have opened their doors to graduates of semi-professional courses, provided the work done in these courses was of sufficiently high grades.

The statement of Eells as to credit for semi-professional work being accepted by the universities is corroborated by Dietsch (11) who found that many colleges

and universities were accepting credit from the junior college for semi-professional courses in which grades of A or B were received.

Davis (9) stated in 1936 that the experience of those in charge of engineering at the University of California had been that to train professional and semi-professional students in the same junior college classes is inefficient and ineffective from standpoint of professional training and success in such mixed classes is no indication as to what the students are capable of doing when they go on to the university. He does not, however, think that the junior college should discontinue their training for the semi-professions. The argument that he gives is quoted at this point:

For a great many years the engineering colleges of the country have been attempting to train all of their students on the upper, or professional level, and the results have been disappointing. This has been necessary because those who possess aptitudes for engineering work in the lower levels had no other place to go. So far as engineering is concerned, the junior colleges could perform no greater service than to offer adequate training on this lower or semi-professional level; for there is real need for draftsmen, inspectors, foremen, and technicians in the field of industry.

Some of the semi-professional courses now given in the junior college involve shop work. Christensen (6) reported in 1935 the following different courses being given by the junior colleges and the number of colleges giving them:

Junior colleges

| | |
|---------------------|----|
| Drawing----- | 37 |
| Woodwork----- | 11 |
| Machine shop----- | 11 |
| Forging----- | 10 |
| Aeronautics----- | 7 |
| Auto mechanics----- | 6 |
| Electricity----- | 6 |
| Pattern making----- | 6 |

Other courses, given in each case by not over five schools, included carpentry, printing, cabinet making, farm mechanics, surveying, welding, reedwork, sheetmetal, artcraft, tool making, wood finishing, and mechanic arts. He reported that the junior colleges with the largest enrollments and those in which finances warrant the purchasing of the necessary equipment and materials were the ones offering the largest number of shop subjects.

The previous studies while representing one or more phases of the problem of the present study have made no reference directly to any one of the junior colleges of Kansas. Two studies, however, dealing with one or more of the public junior colleges of that state have been prepared in connection with the requirements for the master's degree at Colorado State College. Vesta Smith (37) in 1934 made a study of the home economics courses and the equipment for such courses, in the public junior colleges of Kansas. Ray Williams (46) in 1938 completed a study of the Parsons Junior College in connection with a proposed vocational guidance

program. Neither of these research studies touches in any direct way upon the problem involved in the present study, the discussion of which comes in the following pages.

Chapter III
METHODS AND MATERIALS

The general problem of the present study involved four subordinate phases. The first of these related to the occupational intentions of the boys of the Hutchinson High School and their relation to pre-engineering and technical service courses. The second involved the occupations represented in the community as related to the present educational program of the Junior College. The third related to the subjects that should be added to the present Junior College curriculum to meet most nearly the requirements of the first two years of the four-year engineering institutions. The fourth related to the technical service subjects that should be added to the present curriculum and defended on the basis of cost and service to the largest number.

The methods used for gathering data for the various phases of the problem are presented in the present chapter. That relating to the occupational intentions of the boys of the Hutchinson High School will be discussed first.

The questionnaire.-- A questionnaire, to obtain information as to occupational intentions and the relation of such intentions to college plans, was devised by the writer. One question was in regard to the family financial income; such information was desired so as to indicate the possibility of college plans being interfered with by lack of finances.

A first draft of the questionnaire was submitted to the high school principal and to the assistant superintendent of schools of Hutchinson for their criticism. After a few changes had been made the form was tried with a group of senior boys. The questionnaire, a copy of which appears on the following page, was then duplicated for use with a larger group.

The group used.-- It was decided to use 300 boys as the source of data. Since the problem involved pre-engineering and technical service courses, it was felt that only such boys should be used who had taken at least one industrial subject. In fact 276 of the final 300 had had at least two industrial subjects.

It was further decided to classify the boys into three equal groups of 100 each; one group ranking high in both academic and industrial subjects, the second group ranking better in academic subjects, and

QUESTIONNAIRE USED WITH HIGH SCHOOL PUPILS

1. Name _____

2. Address _____

3. Date of birth _____ Age at last birthday _____

4. Check your High School classification.
Sophomore _____ Junior _____ Senior _____

5. What occupation, profession, or kind of employment do you plan to follow after you graduate from High School?

6. Do you think college training would be of value to you in your selected vocation? Yes _____ No _____

7. In what work in High School are you especially interested?

8. Do you plan to complete a four year college course after you have graduated from High School?
Yes _____ No _____

9. If you plan to complete a four year college course do you plan to attend the Hutchinson Junior College as it is now organized for the first two years of your college work? Yes _____ No _____

10. If you do not plan to complete a four year college course do you plan to attend the Hutchinson Junior

College? Yes ____ No ____

11. If you do not plan to attend a four year college nor the Hutchinson Junior College as it is now organized would you likely enroll in the Junior College if it offered courses of a semi-professional or technical nature? Yes ____

No ____

12. Check the amount nearest to your family's yearly income if any of it would be available to aid you in college. \$500 ____ \$1000 ____ \$1500 ____
\$2000 ____ \$5000 ____

13. If you plan to attend the Hutchinson Junior College would you likely have to get financial help from some other source than your family's income? Yes ____ No ____

14. If you plan to attend a four year college away from home would you likely have to get financial help from some other source than your family's income? Yes ____ No ____

15. What is your father's or mother's occupation?

16. Give the name of your father's or mother's employer. _____

the third group ranking higher in industrial subjects. By keeping their records separate it was hoped to throw some light upon the college plans of boys of diverse types and to determine whether any particular group was finding the present junior college program of little value to them in their occupational intentions.

A special card was designed by the writer and used for the purpose of handling the needed information secured from the high school records. Such a card was filled out for each boy in the school who had taken industrial work. Academic averages and industrial subject averages were calculated in each case and placed upon the card. To do this, letter grades were translated into numbers by having A equal 1, B equal 2, C equal 3, D equal 4, and F equal 5. A copy of the card showing the method of adding such data is given in the appendix.

When all cards had been prepared they were thrown into three packs. In the first pack the lowest academic average was set at 2.68, the industrial at 2.26; this gave a group whose grade averages in both academic and industrial subjects were well above C. In the second pack were those who while better in industrial subjects were inferior to the first group in grade achievement; their lowest average for academic

subjects was set at 3.24, with that of industrial subjects placed at 3.80. In the third pack were those who were relatively inferior in academic subjects but relatively satisfactory in industrial subjects; their lowest average for academic subjects was set at 3.66, that for industrial at 2.92. The particular limits were chosen in order to permit each pack to have at least 100 cards.

The questionnaires were filled out in the spring of 1938. The plan used secured boys from all three classes of the high school; though, as would be expected, the cards of fewer sophomores could be used because members of this class would not have taken as much industrial work. Of the 300 boys used, 74 were sophomores, 131 were juniors, and 95 were seniors.

Permission was granted for having all of the boys fill out the questionnaire at a particular hour. In preparation for doing this the writer wrote the name of a boy upon each questionnaire and also a notation as to the teacher in whose room he would be. These questionnaires were placed in the teachers' mailboxes and the teachers were given brief instructions. A few extra boys were given questionnaires to avoid difficulties due to absences. Only 300 filled-in questionnaires were used however.

Analysis of data.-- The questionnaires upon being returned were kept in packs according to the original school-achievement groups. Data transferred from these grouped questionnaires were then prepared for analysis purposes. In connection with the classification of the occupations which the boys had indicated on their questionnaires use was made of the Brussel's Revision of the Barr-Taussig Scale. (38)

Data as to community occupations.-- To determine the different occupations in which those living in Hutchinson were engaged and the number engaged in each, use was made of the city directory (1937). After the entire listing had been completed the occupations were classified according to the Brussel's Revision of the Barr-Taussig Scale previously referred to. Use was made of these classifications to determine training needs along the lines of the problem.

Data as to courses in engineering institutions.-- To secure accurate information as to the courses required in the first two years of the engineering institutions, the engineering fields in which degrees were offered, and the shop courses required by such institutions, the writer secured catalogs from eight institutions, two of which were

located in Kansas. Data from these sources were used in making recommendations as to the pre-engineering courses to be added to the Hutchinson Junior College.

Data as to semi-professional courses in junior colleges.-- To secure data as to the semi-professional courses now in use among junior colleges the writer obtained catalogs from ten such institutions. The knowledge that these institutions were giving such courses was obtained either from fellow students at Colorado State College or from notations appearing in the Junior College Journal. Data from these sources were used as a basis for suggestions as to courses that could be offered at the Hutchinson Junior College.

The following chapters indicate how the data secured from all of these several sources have been used in connection with the various phases of the problem.

Chapter IV

NEEDS FOR TRAINING COURSES FOR PRE-ENGINEERING,
AND FOR TECHNICAL SERVICE OCCUPATIONS

In the present chapter the needs for training courses in the Hutchinson Junior College for pre-engineering, and for technical service occupations will be presented from two standpoints, that of the high school boy who has taken at least one industrial arts subject while in high school, and that of the occupations represented in the community.

A. THE GRADE-DISTRIBUTION OF THE GROUPS STUDIED AND THE
HIGH SCHOOL SUBJECTS OF MAJOR INTEREST

As a background for the data to be presented later in this section there will be introduced at this point a brief discussion of the three high school groups used in this study, with data in regard to the main subject interests of the boys of the three groups.

The high school group involved in the study.--

As stated previously the data for this portion of the present study were secured from 300 high school boys, all of whom had taken at least one industrial subject,

and 275 of whom had taken more than one such subject. Of the 300 boys, 100 constituted a group who were good in both academic and industrial subjects, a second 100 were better in academic than in industrial subjects, and the remaining 100 were better in industrial than in academic subjects. These groups will be referred to in the present chapter as the three "school-achievement groups".

The distribution of the three groups on the basis of average grades made in school is shown in Figure 1. As indicated by the figure, the group representing those boys who are good in both academic and industrial subjects is definitely better in terms of school accomplishment than either of the other groups. There are, however, overlappings in the case of the three groups, with members of both the second and third groups having school grades equally as good as some of the first group. It is, however, between the two groups that are good in industrial subjects that the greatest group differences exist. The group of boys good in both academic and industrial subjects is clearly superior in terms of school accomplishment to the group of boys who are better in industrial subjects.

Subject interests.--On the questionnaire the following question was asked: "In what work in high school are you especially interested?"

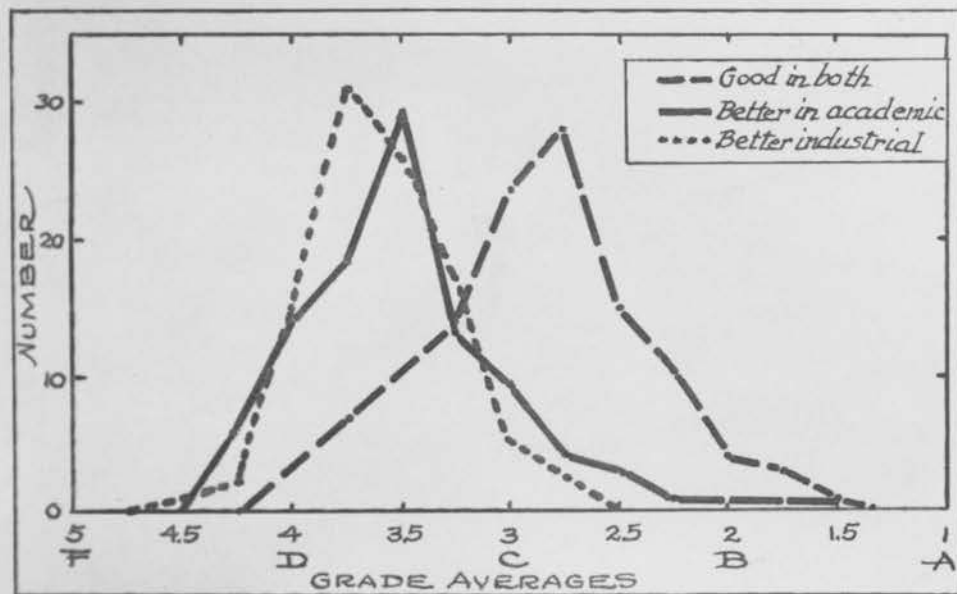


Figure 1.--DISTRIBUTION OF SCHOOL ACHIEVEMENT GROUPS

Of the 300 boys, 279 wrote in the name of the subject or type of school work in which they were especially interested. In case more than one answer was given only the first was recorded, on the assumption that the first one would represent the major interest.

The data given were later grouped by the writer under ten headings, each representing a major type of course offered in the high school curriculum. For example, auto mechanics, printing, woodwork, architectural and mechanical drawing were all listed under the heading of industrial subjects. In this connection information relative to the three school-achievement groups was kept separate.

As is indicated by Table 1 industrial subjects were mentioned as being the high school work in which half of the boys of the entire group were especially interested, as 152 out of 300 indicated such interests. For all three school-achievement groups the industrial subjects ranked first as to subject interest. For the group who were good in both academic and industrial subjects, 55 per cent listed this type of work as being of major subject interest; for those better in academic than in industrial subjects the per cent dropped to 37; for those better in industrial than in academic subjects the number of boys reached 60 per cent.

Table 1.--DISTRIBUTION OF 300 HIGH SCHOOL STUDENTS ON BASIS OF SCHOOL-ACHIEVEMENT GROUPS AND SUBJECT INTEREST IN HIGH SCHOOL

| Subject interest | Achievement groups | | | Total | |
|--------------------------|--------------------|--------------------|----------------------|--------|----------|
| | Good in both | Better in academic | Better in industrial | Number | Per cent |
| Industrial subjects----- | 55 | 37 | 60 | 152 | 50.7 |
| Commercial----- | 12 | 12 | 13 | 37 | 12.3 |
| Science----- | 10 | 14 | 7 | 31 | 10.3 |
| Mathematics----- | 9 | 7 | 2 | 18 | 6.0 |
| Music and art--- | 4 | 5 | 3 | 12 | 4.0 |
| English----- | 4 | 3 | 3 | 10 | 3.3 |
| Social science-- | -- | 7 | 3 | 10 | 3.3 |
| Foreign language | 3 | 2 | -- | 5 | 1.7 |
| Athletics----- | -- | 2 | 1 | 3 | 1.0 |
| Home economics-- | -- | 1 | -- | 1 | .3 |
| No interest listed----- | 3 | 10 | 8 | 21 | 7.0 |
| Total----- | 100 | 100 | 100 | 300 | 99.9 |

As stated above, one-half of the entire group considered industrial subjects as being of special interest. For the remaining one-half, commercial work was considered of most interest by 12 per cent of the entire number, science by 10 per cent, and mathematics by 6 per cent. Each of the remaining six subject fields was represented, but in no case was any one subject field chosen by over 12 pupils, or 4 per cent of the entire number.

In summarizing the situation as it relates to the three groups chosen for study, it is evident that the group of boys good in both academic and

subjects is definitely superior in terms of school accomplishment to the group that is better in industrial subjects. Yet in terms of subject interest there is a great similarity between the two groups, over half of the boys in each group finding some industrial subject of greatest subject interest. A different situation exists for the group of boys who are better in academic subjects. While over a third of the boys (37 per cent) found some industrial subject of greatest subject interest, one-tenth of the total number indicated no subject as being of special interest and the remaining number listed interests distributed over the remaining nine subject divisions, one boy even listing home economics as his subject of major interest.

B. NEEDS FOR ADDITIONAL TRAINING FROM THE STANDPOINT OF HIGH SCHOOL PUPILS

In connection with the major problem the answers to several related questions have been sought, the data for which were to be secured from the boys of the group studied.

1. What are the occupational intentions of these high school boys?
2. What is the relation between the occupational intentions of these boys and their college plans?

3. What per cent of the boys are planning to go to college:
 - (a) to a four-year college only;
 - (b) to junior college and then to a four-year college;
 - (c) to junior college only;
 - (d) to junior college if pre-engineering, and technical service courses are offered?

4. How large a number of boys are giving as occupational intentions those occupations for which pre-engineering, or technical service courses would furnish training?

5. Are there financial conditions which would definitely affect the college plans of a portion of the high school group?

The data relating to each of these questions will be presented and discussed.

Occupational intentions.--In the questionnaire two related questions were asked that dealt with the occupational intentions of the pupils:

What occupation, profession, or kind of employment do you plan to follow after you graduate from high school?

Do you think college training would be of value to you in your selected vocation?

Of the entire number, 273 wrote down an answer to the questions by listing some occupational intention and giving their reaction as to whether college would be of value to them in connection with that occupation. The remaining 27 either wrote "undecided" or left these questions blank.

Table 2 shows the data secured from the questionnaires, with the occupations classified in

Table 2.--OCCUPATIONAL INTENTIONS OF 300 HIGH SCHOOL STUDENTS AS RELATED TO SCHOOL ACHIEVEMENT GROUPS, AND REACTION AS TO VALUE OF COLLEGE FOR SELECTED VOCATION

| Classified occupational intentions | Good in both | | | Better in academic | | | Better in industrial | | | Total for college | | Total listing occupation |
|------------------------------------|--------------|------------------------------------|----|--------------------|------------------------------------|----|----------------------|------------------------------------|----|-------------------|----|--------------------------|
| | Total | Those considering college of value | | Total | Those considering college of value | | Total | Those considering college of value | | Yes | No | |
| | | Yes | No | | Yes | No | | Yes | No | | | |
| PROFESSIONAL | | | | | | | | | | | | |
| Archeologist-- | -- | -- | -- | -- | -- | -- | 1 | -- | 1 | -- | 1 | 1 |
| Doctor----- | 2 | 2 | -- | 1 | 1 | -- | 1 | 1 | -- | 3 | -- | 3 |
| Engineering | | | | | | | | | | | | |
| General----- | 5 | 5 | -- | 3 | 3 | -- | 7 | 7 | -- | 15 | -- | 15 |
| Aeronautical | 1 | 1 | -- | -- | -- | -- | -- | -- | -- | 1 | -- | 1 |
| Architectural | 4 | 4 | -- | -- | -- | -- | -- | -- | -- | 4 | -- | 4 |
| Automobile-- | -- | -- | -- | 1 | 1 | -- | 1 | 1 | -- | 2 | -- | 2 |
| Chemical----- | 3 | 3 | -- | -- | -- | -- | -- | -- | -- | 3 | -- | 3 |
| Civil----- | 2 | 2 | -- | 2 | 2 | -- | 3 | 3 | -- | 7 | -- | 7 |
| Construction | -- | -- | -- | -- | -- | -- | 1 | 1 | -- | 1 | -- | 1 |
| Diesel----- | 3 | 2 | 1 | 2 | 2 | -- | 1 | 1 | -- | 5 | 1 | 6 |
| Electrical-- | 5 | 5 | -- | -- | -- | -- | 4 | 4 | -- | 9 | -- | 9 |
| Mechanical-- | 2 | 2 | -- | -- | -- | -- | 1 | 1 | -- | 3 | -- | 3 |
| Mining----- | -- | -- | -- | 1 | 1 | -- | -- | -- | -- | 1 | -- | 1 |
| Petroleum--- | 1 | -- | -- | -- | -- | -- | 1 | 1 | -- | 1 | -- | 1 |
| Radio----- | -- | -- | -- | 1 | 1 | -- | 1 | -- | 1 | 1 | 1 | 2 |
| Television-- | 1 | -- | 1 | -- | -- | -- | -- | -- | -- | -- | 1 | 1 |
| Geologist----- | 1 | 1 | -- | -- | -- | -- | 2 | 2 | -- | 3 | -- | 3 |
| Lawyer----- | -- | -- | -- | 1 | 1 | -- | 3 | 3 | -- | 4 | -- | 4 |
| Total----- | 29 | 27 | 2 | 12 | 12 | -- | 26 | 24 | 2 | 63 | 4 | 67 |
| LOWER PROFESSIONAL | | | | | | | | | | | | |
| Accountant--- | 4 | 3 | 1 | 3 | 3 | -- | -- | -- | -- | 6 | 1 | 7 |
| Architect--- | 2 | 2 | -- | 2 | 1 | 1 | 1 | 1 | -- | 4 | 1 | 5 |
| Navy----- | -- | -- | -- | -- | -- | -- | 1 | 1 | -- | 1 | -- | 1 |
| Artist | | | | | | | | | | | | |
| Commercial- | -- | -- | -- | 1 | 1 | -- | 1 | 1 | -- | 2 | -- | 2 |
| Auditor----- | 1 | 1 | -- | -- | -- | -- | -- | -- | -- | 1 | -- | 1 |

Table 2.--OCCUPATIONAL INTENTIONS OF 300 HIGH SCHOOL STUDENTS AS RELATED TO SCHOOL ACHIEVEMENT GROUPS, AND REACTION AS TO VALUE OF COLLEGE FOR SELECTED VOCATION (continued)

| Classified occupational intentions | Good in both | | Better in academic | | Better in industrial | | Total for college | | Total listing occupation | |
|---|--------------|------------------------------------|--------------------|------------------------------------|----------------------|------------------------------------|-------------------|----|--------------------------|-----|
| | Total | Those considering college of value | Total | Those considering college of value | Total | Those considering college of value | Yes | No | | |
| | | | | | | | | | | Yes |
| Chiropractor---- | -- | -- | 1 | 1 | -- | -- | 1 | -- | 1 | |
| Farm agent---- | -- | -- | -- | -- | 1 | 1 | 1 | -- | 1 | |
| Journalist---- | 3 | 2 | 1 | 1 | -- | -- | 3 | 1 | 4 | |
| Militarist---- | 2 | 2 | 1 | 1 | -- | -- | 3 | -- | 3 | |
| Minister---- | -- | -- | 2 | 2 | 1 | 1 | 3 | -- | 3 | |
| Oil operator---- | 2 | 2 | 1 | 1 | 3 | 3 | 6 | -- | 6 | |
| Oil field supt | -- | -- | -- | -- | 1 | 1 | 1 | -- | 1 | |
| Research work | -- | -- | 1 | 1 | -- | -- | 1 | -- | 1 | |
| Teacher---- | 3 | 3 | 1 | 1 | 6 | 5 | 9 | 1 | 10 | |
| Veterinary---- | -- | -- | -- | -- | 1 | 1 | 1 | -- | 1 | |
| Total----- | 17 | 15 | 14 | 13 | 1 | 16 | 15 | 4 | 47 | |
| TECHNICAL, CLERICAL, SUPERVISORY OCCUPATIONS | | | | | | | | | | |
| Air condition- ing----- | 2 | -- | 2 | 1 | 1 | -- | -- | 1 | 2 | 3 |
| Aviator----- | 1 | 1 | 3 | 2 | 1 | 1 | 1 | 4 | 1 | 5 |
| Bookkeeper---- | 3 | 3 | -- | -- | 3 | 3 | 6 | -- | 6 | |
| Business | | | | | | | | | | |
| General----- | -- | -- | 1 | 1 | 1 | 1 | 2 | -- | 2 | |
| Auto salvage | 1 | -- | 1 | -- | -- | -- | -- | 1 | 1 | |
| Furniture---- | 1 | 1 | -- | -- | -- | -- | 1 | -- | 1 | |
| Lumber----- | -- | -- | -- | -- | 1 | 1 | 1 | -- | 1 | |
| Civil service- | -- | -- | 1 | 1 | 1 | 1 | 2 | -- | 2 | |
| Contractor | | | | | | | | | | |
| Building----- | -- | -- | 1 | 1 | -- | -- | 1 | -- | 1 | |
| Construction | 1 | 1 | -- | -- | -- | -- | 1 | -- | 1 | |
| Draftsman---- | 1 | 1 | -- | -- | -- | -- | 1 | -- | 1 | |
| Inspector, Grain | -- | -- | 1 | 1 | -- | -- | 1 | -- | 1 | |

Table 2.--OCCUPATIONAL INTENTIONS OF 300 HIGH SCHOOL STUDENTS AS RELATED TO SCHOOL ACHIEVEMENT GROUPS, AND REACTION AS TO VALUE OF COLLEGE FOR SELECTED VOCATION (continued)

| Classified occupational intentions | Good in both | | | Better in academic | | | Better in industrial | | | Total for college | | Total listing occupation |
|---|--------------|------------------------------------|----|--------------------|------------------------------------|----|----------------------|------------------------------------|----|-------------------|----|--------------------------|
| | Total | Those considering college of value | | Total | Those considering college of value | | Total | Those considering college of value | | Yes | No | |
| | | Yes | No | | Yes | No | | Yes | No | | | |
| | | Yes | No | | Yes | No | | Yes | No | Yes | No | |
| Musician----- | 1 | 1 | -- | 3 | 2 | 1 | 2 | 2 | -- | 5 | 1 | 6 |
| Oil field supplies---- | -- | -- | -- | 2 | 1 | 1 | -- | -- | -- | 1 | 1 | 2 |
| Realtor----- | -- | -- | -- | 1 | 1 | -- | -- | -- | -- | 1 | -- | 1 |
| Radio work---- | 1 | 1 | -- | 2 | 1 | 1 | -- | -- | -- | 2 | 1 | 3 |
| Refrigeration---- | -- | -- | -- | 1 | 1 | -- | -- | -- | -- | 1 | -- | 1 |
| Salvation Army officer---- | -- | -- | -- | -- | -- | -- | 1 | -- | 1 | -- | 1 | 1 |
| Stenographer-- | 1 | 1 | -- | -- | -- | -- | -- | -- | -- | 1 | -- | 1 |
| Total----- | 13 | 10 | 3 | 17 | 13 | 4 | 10 | 9 | 1 | 32 | 8 | 40 |
| SKILLED TRADESMEN & LOW-GRADE CLERICAL WORKERS | | | | | | | | | | | | |
| Agricultural-ist----- | 1 | 1 | -- | 1 | 1 | -- | 1 | 1 | -- | 3 | -- | 3 |
| Butcher----- | -- | -- | -- | 1 | -- | 1 | -- | -- | -- | -- | 1 | 1 |
| Carpenter----- | 1 | 1 | -- | -- | -- | -- | 1 | 1 | -- | 2 | -- | 2 |
| Clerk----- | -- | -- | -- | 1 | 1 | -- | -- | -- | -- | 1 | -- | 1 |
| Cobbler----- | 1 | -- | 1 | -- | -- | -- | 1 | 1 | -- | 1 | 1 | 2 |
| Electrician--- | 1 | 1 | -- | 1 | 1 | -- | -- | -- | -- | 2 | -- | 2 |
| Farmer----- | 9 | 8 | 1 | 9 | 7 | 2 | 10 | 8 | 2 | 23 | 5 | 28 |
| Floor sander-- | -- | -- | -- | 1 | 1 | -- | -- | -- | -- | 1 | -- | 1 |
| Forester----- | 2 | 1 | 1 | 1 | 1 | -- | -- | -- | -- | 2 | 1 | 3 |
| Grocer----- | 1 | 1 | -- | 1 | 1 | -- | 1 | -- | 1 | 2 | 1 | 3 |
| Machinist---- | 1 | 1 | -- | 1 | -- | 1 | 1 | 1 | -- | 2 | 1 | 3 |
| Mechanic General----- | 1 | 1 | -- | 3 | 1 | 2 | 5 | 2 | 3 | 4 | 5 | 9 |

Table 2.--OCCUPATIONAL INTENTIONS OF 300 HIGH SCHOOL STUDENTS AS RELATED TO SCHOOL ACHIEVEMENT GROUPS, AND REACTION AS TO VALUE OF COLLEGE FOR SELECTED VOCATION (continued)

| Classified occupational intentions | Good in both | | Better in academic | | Better in industrial | | Total for college | | Total listing occupation | | | |
|------------------------------------|--------------|------------------------------------|--------------------|------------------------------------|----------------------|------------------------------------|-------------------|----|--------------------------|-----|----|-----|
| | Total | Those considering college of value | Total | Those considering college of value | Total | Those considering college of value | Yes | No | | | | |
| | | | | | | | | | | Yes | No | Yes |
| Mechanic | | | | | | | | | | | | |
| Airplane---- | -- | -- | -- | -- | 4 | 4 | -- | 4 | -- | 4 | | |
| Automobile-- | 1 | 1 | -- | 3 | 7 | 6 | 1 | 7 | 4 | 11 | | |
| Meat cutter---- | 1 | -- | 1 | -- | -- | -- | -- | -- | 1 | 1 | | |
| Office worker-- | 2 | 2 | -- | 2 | 1 | 1 | -- | 3 | 1 | 4 | | |
| Oil field worker---- | 1 | 1 | -- | -- | -- | -- | -- | 1 | -- | 1 | | |
| Painter----- | 1 | 1 | -- | -- | -- | -- | -- | 1 | -- | 1 | | |
| Pilot----- | 2 | 2 | -- | -- | 1 | 1 | -- | 3 | -- | 3 | | |
| Plumber----- | 1 | 1 | -- | -- | -- | -- | -- | 1 | -- | 1 | | |
| Printer----- | 4 | 3 | 1 | 1 | 5 | 4 | 1 | 7 | 3 | 10 | | |
| Projectionist-- | -- | -- | -- | 1 | -- | 1 | -- | -- | 1 | 1 | | |
| Salesman----- | 2 | 2 | -- | 3 | 1 | 2 | 2 | 5 | 2 | 7 | | |
| Telephone lineman---- | -- | -- | -- | 2 | 1 | 1 | -- | 1 | 1 | 2 | | |
| Welder----- | -- | -- | -- | 1 | 1 | -- | -- | 1 | -- | 1 | | |
| Woodworker---- | -- | -- | -- | -- | 2 | 1 | 1 | 1 | 1 | 2 | | |
| Total----- | 33 | 28 | 5 | 33 | 18 | 15 | 41 | 32 | 9 | 78 | 29 | 107 |
| SEMI-SKILLED OCCUPATIONS | | | | | | | | | | | | |
| Ball Player---- | -- | -- | -- | 1 | 1 | -- | 1 | 1 | -- | 2 | -- | 2 |
| Carrier, mail---- | -- | -- | -- | 1 | 1 | -- | -- | -- | 1 | -- | -- | 1 |
| Fireman, city---- | -- | -- | -- | -- | -- | -- | 1 | 1 | -- | 1 | -- | 1 |
| G-man----- | -- | -- | -- | 1 | 1 | -- | -- | -- | 1 | -- | -- | 1 |
| Navy----- | -- | -- | -- | 2 | 2 | -- | 1 | -- | 1 | 2 | 1 | 3 |
| Policeman---- | 1 | 1 | -- | -- | -- | -- | -- | -- | 1 | -- | -- | 1 |
| Restauranteur-- | -- | -- | -- | 1 | 1 | -- | -- | -- | 1 | -- | -- | 1 |
| Total----- | 1 | 1 | -- | 6 | 6 | -- | 3 | 2 | 1 | 9 | 1 | 10 |

Table 2.--OCCUPATIONAL INTENTIONS OF 300 HIGH SCHOOL STUDENTS AS RELATED TO SCHOOL ACHIEVEMENT GROUPS, AND REACTION AS TO VALUE OF COLLEGE FOR SELECTED VOCATION (continued)

| Classified occupational intentions | Good in both | | | Better in academic | | | Better in industrial | | | Total for college | | Total listing occupation |
|------------------------------------|--------------|------------------------------------|----|--------------------|------------------------------------|----|----------------------|------------------------------------|----|-------------------|----|--------------------------|
| | Total | Those considering college of value | | Total | Those considering college of value | | Total | Those considering college of value | | Yes | No | |
| | | Yes | No | | Yes | No | | Yes | No | | | |
| UNSKILLED OCCUPATIONS | | | | | | | | | | | | |
| Laborer----- | -- | -- | -- | 1 | 1 | -- | 1 | 1 | -- | 2 | -- | 2 |
| UNDECIDED AND NO ANSWER--- | 7 | 3 | 4 | 17 | 11 | 6 | 3 | 1 | 2 | 15 | 12 | 27 |
| Grand total- | 100 | 84 | 16 | 100 | 74 | 26 | 100 | 84 | 16 | 242 | 58 | 300 |

accordance with Brussel's revision of the Barr-Taussig scale (38). The six classifications of the scale (in abbreviated form) are (1) professional, (2) lower professional, (3) technical, clerical, and supervisory occupations, (4) skilled tradesmen and low grade clerical workers, (5) semi-skilled occupations, and (6) unskilled occupations.

Of the entire 300 boys, 67 gave occupational intentions that came under the professional classification; 57 of these were interested in some phase of engineering. Those interested in engineering were largely drawn from two of the three school-achievement groups: those good in both academic and industrial subjects--of whom there were 26; and those better in industrial subjects--of whom there were 20. With two exceptions all of those interested in engineering felt that college training was necessary for their choice of an occupation. In the case of the two exceptions one listed radio engineering, the other television engineering. The latter has not, as yet, appeared as a college field of training.

Some one of the lower professional occupations was selected by 47 of the 300 in connection with occupational intentions. Of this group only that of teaching was chosen by at least 10 different individuals. Of the remaining number, six intended to become oil

operators, and an equal number to become architects. With two exceptions all of those mentioned felt that college training would be valuable for their vocational choice.

In the technical, clerical, and supervisory occupations a total of 40 boys made choices. Aviation was selected by five boys, radio work by three, air conditioning by three, oil field supplies by three, being a contractor by two, while one each selected refrigeration and being a draftsman. More numerous than any of the above were bookkeeping, selected by six boys, and the work of the musician, selected by an equal number. For the entire group of 40 boys, only eight thought that college training would not be of value in connection with their selected vocation.

Of the occupations represented by skilled tradesmen and low grade clerical workers a total of 107 were chosen by the 300 high school boys. The majority chose one of the following four occupations: farming, chosen by 28; automobile mechanics, selected by 11; printing, by 10; and general mechanics, by 9. The work of other industrial occupations chosen by not over three boys each were those of the carpenter, electrician, machinist, oil field worker, painter, airplane pilot, plumber, projectionist, telephone linemen, welder, and woodworker. All three school-achievement

groups were well represented in the above choices, with approximately one-third of each group selecting occupations in this general classification. The achievement group which did better in industrial subjects was represented to the extent of 41 per cent of their entire number.

As to the value of college training in relation to the occupational intentions, only 28 of the 107 stated that they felt that such training would not be of value to them.

Of ~~the~~ semi-skilled occupations only 10 were chosen, representing such various occupations as those of the ball player, 2; mail carrier, 1; city fireman, 1; G-man, 1; navy, 3; policeman, 1; and restaurateur, 1. Oddly enough only one of the ten thought that college training was of no value in his selected occupation.

Two boys chose unskilled occupations, that of common labor. Both thought a college education was of value for the occupation.

Of the entire 300, 27 were undecided as to their occupational intentions; 17 of these were in the second school-achievement group--those that were better in academic work, while 7 were in the first group--those that were good in both academic and industrial subjects, and only 3 were in the third group--those who were better in industrial subjects. Of the 27 who

were undecided, 15 felt that college would be of value.

College plans.--Table 3 shows the occupational intentions of the 300 high school boys in relation to their college plans. In order to obtain data as to such plans the following questions were asked:

Do you plan to complete a four-year college course after you have graduated from high school?

If you plan to complete a four-year college course do you plan to attend the Hutchinson Junior College as it is now organized, for the first two years of your college work?

If you do not plan to complete a four-year college course, do you plan to attend the Hutchinson Junior College?

If you do not plan to attend either a four-year college or the Hutchinson Junior College as it is now organized, would you likely enroll in the junior college if it offered courses of a semi-professional or technical nature?

Of the entire number only 27 either stated they were undecided as to their college plans or made no answer.

In connection with the preparation of the table that follows, the college plans of the various boys were classified so as to show the relation of such plans to the occupational intentions of the boys.

A large proportion (50 out of 67) of those intending to follow the professions, as listed under the first classification of the table, were planning to attend four years of college; 30 out of the 50 were planning to go to junior college before going on to the

Column of totals found on second page of 3A, 3B, 3C, 3D.

Table 3A.-COLLEGE PLANS OF 300 HIGH SCHOOL PUPILS IN RELATION TO OCCUPATIONAL INTENTIONS AND SCHOOL ACHIEVEMENT GROUPS

(Group 1, students high in both academic and industrial courses; group 2, those better in academic; group 3, those better in industrial)

| Occupational intentions | College intentions, by school achievement groups | | | | | | | | |
|-------------------------|--|----|----|--|----|----|---------------------|----|----|
| | Four year college only | | | Junior college, then four-year college | | | Junior college only | | |
| | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 |
| | | | | | | | | | |
| PROFESSIONAL | | | | | | | | | |
| Archeologist---- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Doctor----- | -- | -- | -- | 2 | 1 | -- | -- | -- | -- |
| Engineering | | | | | | | | | |
| General----- | 2 | 1 | 3 | 2 | 2 | 3 | -- | -- | 1 |
| Aeronautical- | 1 | -- | -- | -- | -- | -- | -- | -- | -- |
| Architectural | 1 | -- | -- | 2 | -- | -- | -- | -- | -- |
| Autmobile---- | -- | -- | -- | -- | 1 | -- | -- | -- | 1 |
| Chemical----- | 1 | -- | -- | 2 | -- | -- | -- | -- | -- |
| Civil----- | 1 | 1 | -- | -- | 1 | 2 | 1 | -- | -- |
| Construction- | -- | -- | 1 | -- | -- | -- | -- | -- | -- |
| Diesel----- | -- | 2 | -- | 1 | -- | -- | 2 | -- | -- |
| Electrical--- | 1 | -- | 2 | 3 | -- | 2 | 1 | -- | -- |
| Mechanical--- | -- | -- | -- | 2 | -- | -- | -- | -- | -- |
| Mining----- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Petroleum---- | -- | -- | -- | -- | -- | 1 | -- | -- | -- |
| Radio----- | -- | -- | -- | -- | -- | -- | -- | 1 | -- |
| Television--- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Geologist----- | -- | -- | 1 | 1 | -- | -- | -- | -- | 1 |
| Lawyer----- | -- | -- | 2 | -- | 1 | 1 | -- | -- | -- |
| Total----- | 7 | 4 | 9 | 15 | 6 | 9 | 4 | 1 | 3 |
| LOWER PROFESSIONAL | | | | | | | | | |
| Accountant----- | 1 | -- | -- | 2 | 2 | -- | 1 | 1 | -- |
| Architect----- | -- | -- | -- | 2 | 1 | 1 | -- | 1 | -- |
| Navy----- | -- | -- | -- | -- | -- | 1 | -- | -- | -- |
| Artist, commercial----- | -- | -- | -- | -- | 1 | 1 | -- | -- | -- |
| Auditor----- | -- | -- | -- | 1 | -- | -- | -- | -- | -- |
| Chiropractor--- | -- | 1 | -- | -- | -- | -- | -- | -- | -- |
| Farm agent----- | -- | -- | -- | -- | -- | 1 | -- | -- | -- |
| Journalist----- | -- | -- | -- | 2 | 1 | -- | -- | -- | -- |

Continued

Table 3A.--COLLEGE PLANS OF 300 HIGH SCHOOL PUPILS IN RELATION TO OCCUPATIONAL INTENTIONS AND SCHOOL ACHIEVEMENT GROUPS (continued)

(Group 1, students high in both academic and industrial courses; group 2, those better in academic; group 3, those better in industrial)

| Occupational intentions | College intentions, by school achievement groups | | | | | | Total |
|---------------------------|--|----|----|------------------------------------|----|----|-------|
| | Junior college if certain courses are given | | | Undecided, or not going to college | | | |
| | 1 | 2 | 3 | 1 | 2 | 3 | |
| PROFESSIONAL | | | | | | | |
| Archeologist--- | -- | -- | -- | -- | -- | 1 | 1 |
| Doctor----- | -- | -- | -- | -- | -- | -- | 3 |
| Engineering | | | | | | | |
| General----- | 1 | -- | -- | -- | -- | -- | 15 |
| Aeronautical-- | -- | -- | -- | -- | -- | -- | 1 |
| Architectural | -- | -- | -- | 1 | -- | -- | 4 |
| Automobile--- | -- | -- | -- | -- | -- | -- | 2 |
| Chemical----- | -- | -- | -- | -- | -- | -- | 3 |
| Civil----- | -- | -- | 1 | -- | -- | -- | 7 |
| Construction-- | -- | -- | -- | -- | -- | -- | 1 |
| Diesel----- | -- | -- | -- | -- | -- | 1 | 6 |
| Electrical--- | -- | -- | -- | -- | -- | -- | 9 |
| Mechanical--- | -- | -- | 1 | -- | -- | -- | 3 |
| Mining----- | -- | -- | -- | -- | 1 | -- | 1 |
| Petroleum--- | -- | -- | -- | -- | -- | -- | 1 |
| Radio----- | -- | -- | 1 | -- | -- | -- | 2 |
| Television--- | 1 | -- | -- | -- | -- | -- | 1 |
| Geologist----- | -- | -- | -- | -- | -- | -- | 3 |
| Lawyer----- | -- | -- | -- | -- | -- | -- | 4 |
| Total----- | 2 | -- | 3 | 1 | 1 | 2 | 67 |
| LOWER PROFESSIONAL | | | | | | | |
| Accountant----- | -- | -- | -- | -- | -- | -- | 7 |
| Architect----- | -- | -- | -- | -- | -- | 0 | 5 |
| Navy----- | -- | -- | -- | -- | -- | -- | 1 |
| Artist, commercial----- | -- | -- | -- | -- | -- | -- | 2 |
| Auditor----- | -- | -- | -- | -- | -- | -- | 1 |
| Chiropractor--- | -- | -- | -- | -- | -- | -- | 1 |
| Farm agent----- | -- | -- | -- | -- | -- | -- | 1 |
| Journalist----- | 1 | -- | -- | -- | -- | -- | 4 |

Table 3B.--COLLEGE PLANS OF 300 HIGH SCHOOL PUPILS IN
RELATION TO OCCUPATIONAL INTENTIONS AND SCHOOL
ACHIEVEMENT GROUPS (continued)

(Group 1, students high in both academic and industrial
courses; group 2, those better in academic; group 3,
those better in industrial)

| Occupational intentions | College intentions, by school achievement groups | | | | | | | | |
|---|---|----|----|---|----|----|---------------------------|----|----|
| | Four year college only | | | Junior col- lege, then four-year college | | | Junior college only | | |
| | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 |
| Militarist----- | -- | -- | -- | -- | -- | -- | 2 | -- | -- |
| Minister----- | -- | 1 | 1 | -- | 1 | -- | -- | -- | -- |
| Oil operator--- | 1 | -- | -- | 1 | 1 | 2 | -- | -- | -- |
| Oil field supt. | -- | -- | -- | -- | -- | 1 | -- | -- | -- |
| Research work-- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Teacher----- | 1 | -- | -- | 2 | 1 | 6 | -- | -- | -- |
| Veterinary----- | -- | -- | -- | -- | -- | -- | -- | -- | 1 |
| Total----- | 3 | 2 | 1 | 10 | 8 | 13 | 3 | 2 | 1 |
| TECHNICAL, CLERICAL, SUPERVISORY OCCUPATIONS | | | | | | | | | |
| Air conditioning | -- | 1 | -- | -- | -- | -- | -- | -- | -- |
| Aviator----- | -- | -- | -- | -- | -- | 1 | -- | 3 | -- |
| Bookkeeper----- | -- | -- | -- | -- | -- | -- | 3 | -- | 2 |
| Business----- | -- | -- | -- | -- | -- | 1 | -- | -- | -- |
| Auto-salvage--- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Furniture----- | -- | -- | -- | -- | -- | -- | 1 | -- | -- |
| Lumber----- | -- | -- | -- | -- | -- | 1 | -- | -- | -- |
| Civil service--- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Contractor | | | | | | | | | |
| Building----- | -- | -- | -- | -- | 1 | -- | -- | -- | -- |
| Construction--- | -- | -- | -- | 1 | -- | -- | -- | -- | -- |
| Draftsman----- | -- | -- | -- | -- | -- | -- | 1 | -- | -- |
| Inspector, grain | -- | -- | -- | -- | 1 | -- | -- | -- | -- |
| Musician----- | -- | 1 | -- | 1 | 1 | 1 | 1 | -- | 1 |
| Oil field supplies----- | -- | 1 | -- | -- | -- | -- | -- | 1 | -- |
| Realtor----- | -- | -- | -- | -- | 1 | -- | -- | -- | -- |
| Radio work----- | -- | -- | -- | -- | 1 | -- | -- | -- | -- |
| Refrigeration-- | -- | -- | -- | -- | 1 | -- | -- | -- | -- |

Continued

Table 3B--COLLEGE PLANS OF 300 HIGH SCHOOL PUPILS IN RELATION TO OCCUPATIONAL INTENTIONS AND SCHOOL ACHIEVEMENT GROUPS (continued)

(Group 1, students high in both academic and industrial courses; group 2, those better in academic; group 3, those better in industrial)

| Occupational intentions | College intentions, by school achievement groups | | | | | | Total |
|---|--|----|----|------------------------------------|----|----|-------|
| | Junior college if certain courses are given | | | Undecided, or not going to college | | | |
| | 1 | 2 | 3 | 1 | 2 | 3 | |
| Militarist----- | -- | -- | -- | -- | 1 | -- | 3 |
| Minister----- | -- | -- | -- | -- | -- | -- | 2 |
| Oil operator--- | -- | -- | 1 | -- | -- | -- | 6 |
| Oil field supt. | -- | -- | -- | -- | -- | -- | 1 |
| Research work-- | -- | 1 | -- | -- | -- | -- | 1 |
| Teacher----- | -- | -- | -- | -- | -- | -- | 10 |
| Veterinary----- | -- | -- | -- | -- | -- | -- | 1 |
| Total----- | 1 | 1 | 1 | -- | 1 | -- | 47 |
| TECHNICAL, CLERICAL, SUPERVISORY OCCUPATIONS | | | | | | | |
| Air conditioning | 2 | -- | -- | -- | -- | -- | 3 |
| Aviator----- | 1 | -- | -- | -- | -- | -- | 5 |
| Bookkeeper----- | -- | -- | 1 | -- | -- | -- | 6 |
| Business----- | -- | -- | -- | -- | 1 | -- | 2 |
| Auto-salvage- | -- | -- | -- | 1 | -- | -- | 1 |
| Furniture---- | -- | -- | -- | -- | -- | -- | 1 |
| Lumber----- | -- | -- | -- | -- | -- | -- | 1 |
| Civil service-- | -- | 1 | -- | -- | -- | 1 | 2 |
| Contractor | | | | | | | |
| Building----- | -- | -- | -- | -- | -- | -- | 1 |
| Construction- | -- | -- | -- | -- | -- | -- | 1 |
| Draftsman----- | -- | -- | -- | -- | -- | -- | 1 |
| Inspector, grain | -- | -- | -- | -- | -- | -- | 1 |
| Musician----- | -- | 1 | -- | -- | -- | -- | 6 |
| Oil field supplies----- | -- | -- | -- | -- | -- | -- | 2 |
| Realtor----- | -- | -- | -- | -- | -- | -- | 1 |
| Radio work----- | 1 | -- | -- | -- | 1 | -- | 3 |
| Refrigeration-- | -- | -- | -- | -- | -- | -- | 1 |

Table 3G--COLLEGE PLANS OF 300 HIGH SCHOOL PUPILS IN
RELATION TO OCCUPATIONAL INTENTIONS AND SCHOOL
ACHIEVEMENT GROUPS (continued)

(Group 1, students high in both academic and industrial
courses; group 2, those better in academic; group 3,
those better in industrial)

| Occupational intentions | College intentions, by school achievement groups | | | | | | | | |
|--|---|----|----|---|----|----|---------------------------|----|----|
| | Four year college only | | | Junior col- lege, then four-year college | | | Junior college only | | |
| | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 |
| Salvation army officer----- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Stenographer--- | -- | -- | -- | 1 | -- | -- | -- | -- | -- |
| Total----- | 0 | 3 | 0 | 2 | 6 | 4 | 6 | 4 | 3 |
| SKILLED TRADES* MEN & LOW- GRADE CLERI- CAL WORKERS | | | | | | | | | |
| Agriculturist-- | -- | 1 | -- | 1 | -- | -- | -- | -- | 1 |
| Butcher----- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Carpenter----- | -- | -- | -- | 1 | -- | -- | -- | -- | -- |
| Clerk----- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Cobbler----- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Electrician--- | 1 | -- | -- | -- | 1 | -- | -- | -- | -- |
| Farmer----- | -- | 1 | -- | 3 | 3 | 1 | 2 | 3 | 4 |
| Floor sander--- | -- | -- | -- | -- | -- | -- | 1 | -- | -- |
| Forester----- | -- | 1 | -- | 1 | -- | -- | -- | -- | -- |
| Grocer----- | -- | -- | -- | 1 | -- | -- | -- | 1 | -- |
| Machinist----- | -- | -- | -- | -- | -- | -- | 1 | -- | -- |
| Machanic----- | -- | -- | -- | -- | -- | 1 | 1 | 1 | -- |
| Airplane--- | -- | -- | -- | -- | -- | 1 | -- | -- | 1 |
| Automobile--- | -- | -- | -- | -- | -- | 1 | -- | 1 | 1 |
| Meat cutter--- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Office worker-- | -- | -- | -- | 1 | -- | -- | 1 | -- | -- |
| Oil field worker----- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Painter----- | -- | -- | -- | -- | -- | -- | 1 | -- | -- |
| Pilot----- | 1 | -- | -- | -- | -- | -- | 1 | -- | 1 |
| Plumber----- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Printer----- | -- | -- | -- | -- | -- | -- | 2 | -- | -- |
| Projectionist-- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Salesman----- | -- | -- | -- | -- | -- | 1 | 1 | 1 | -- |

Table 3C.--COLLEGE PLANS OF 300 HIGH SCHOOL PUPILS IN
RELATION TO OCCUPATIONAL INTENTIONS AND SCHOOL
ACHIEVEMENT GROUPS (continued)

(Group 1, students high in both academic and industrial
courses; group 2, those better in academic; group 3,
those better in industrial)

| Occupational intentions | College intentions, by school achievement groups | | | | | | Total |
|---|--|----|----|--|----|----|-------|
| | Junior college if certain courses are given | | | Undecided, or not going to college | | | |
| | 1 | 2 | 3 | 1 | 2 | 3 | |
| Salvation army officer----- | -- | -- | -- | -- | -- | 1 | 1 |
| Stenographer--- | -- | -- | -- | -- | -- | -- | 1 |
| Total----- | 4 | 2 | 1 | 1 | 2 | 2 | 40 |
| SKILLED TRADES-- MEN & LOW- GRADE CLERI- CAL WORKERS | | | | | | | |
| Agriculturist-- | -- | -- | -- | -- | -- | -- | 3 |
| Butcher----- | -- | -- | -- | -- | 1 | -- | 1 |
| Carpenter----- | -- | -- | 1 | -- | -- | -- | 2 |
| Clerk----- | -- | -- | -- | -- | 1 | -- | 1 |
| Cobbler----- | -- | -- | 1 | 1 | -- | -- | 2 |
| Electrician---- | -- | -- | -- | -- | -- | -- | 2 |
| Farmer----- | 2 | 1 | 1 | 2 | 1 | 4 | 28 |
| Floor sander--- | -- | -- | -- | -- | -- | -- | 1 |
| Forester----- | -- | -- | -- | 1 | -- | -- | 3 |
| Grocer----- | -- | -- | -- | -- | -- | 1 | 3 |
| Machinist----- | -- | 1 | 1 | -- | -- | -- | 3 |
| Mechanic----- | -- | 2 | 4 | -- | -- | -- | 9 |
| Airplane---- | -- | -- | 3 | -- | -- | -- | 5 |
| Automobile--- | 1 | -- | 2 | -- | 2 | 2 | 10 |
| Meat cutter--- | -- | -- | -- | 1 | -- | -- | 1 |
| Office worker-- | -- | 1 | -- | -- | -- | -- | 3 |
| Oil field worker | -- | -- | -- | 1 | 1 | -- | 2 |
| Painter----- | -- | -- | -- | -- | -- | 1 | 2 |
| Pilot----- | -- | -- | -- | -- | -- | -- | 3 |
| Plumber----- | 1 | -- | -- | -- | -- | -- | 1 |
| Printer----- | 1 | -- | 3 | 1 | 1 | 1 | 9 |
| Projectionist-- | -- | -- | -- | -- | 1 | ee | 1 |
| Salesman----- | -- | -- | 1 | 1 | 2 | -- | 7 |

Table 3D.-COLLEGE PLANS OF 300 HIGH SCHOOL PUPILS IN
RELATION TO OCCUPATIONAL INTENTIONS AND SCHOOL
ACHIEVEMENT GROUPS (continued)

(Group 1, students high in both academic and industrial
courses; group 2, those better in academic; group 3,
those better in industrial)

| Occupational intentions | College intentions, by school achievement groups | | | | | | | | |
|--------------------------------|--|----|----|--|----|----|---------------------|----|----|
| | Four year college only | | | Junior college, then four-year college | | | Junior college only | | |
| | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 |
| Telephone lineman----- | -- | -- | -- | -- | -- | -- | -- | 1 | -- |
| Welder----- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Woodworker----- | -- | -- | -- | -- | -- | -- | -- | -- | 1 |
| Total----- | 2 | 3 | 0 | 8 | 4 | 5 | 10 | 9 | 9 |
| SEMI-SKILLED OCCUPATIONS | | | | | | | | | |
| Ball player---- | -- | 1 | -- | -- | -- | -- | -- | -- | -- |
| Carrier, mail-- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Fireman, city-- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| G-man----- | -- | -- | -- | -- | 1 | -- | -- | -- | -- |
| Navy----- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Policeman----- | -- | -- | -- | 1 | -- | -- | -- | -- | -- |
| Restaurateur-- | -- | -- | -- | -- | -- | -- | -- | 1 | -- |
| Total----- | 0 | 1 | 0 | 1 | 2 | 0 | 0 | 1 | 0 |
| UNSKILLED OCCUPATIONS | | | | | | | | | |
| Laborer----- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| UNDECIDED AND NO ANSWER---- | | | | | | | | | |
| | 1 | -- | 2 | 4 | 3 | -- | 2 | 5 | 1 |
| GRAND TOTAL-- | 13 | 13 | 12 | 40 | 29 | 31 | 25 | 22 | 17 |
| COLLEGE-PLAN TOTAL----- | 38 | | | 100 | | | 64 | | |

Continued

Table 3D.--COLLEGE PLANS OF 300 HIGH SCHOOL PUPILS IN
RELATION TO OCCUPATIONAL INTENTIONS AND SCHOOL
ACHIEVEMENT GROUPS (continued)

(Group 1, students high in both academic and industrial
courses; group 2, those better in academic; group 3,
those better in industrial)

| Occupational intentions | College intentions, by school achievement groups | | | | | | Total |
|--------------------------------|--|----|----|--|----|----|-------|
| | Junior college if certain courses are given | | | Undecided, or not going to college | | | |
| | 1 | 2 | 3 | 1 | 2 | 3 | |
| Telephone lineman----- | -- | 1 | -- | -- | -- | -- | 2 |
| Welder----- | -- | -- | -- | -- | 1 | -- | 1 |
| Woodworker----- | -- | -- | 1 | -- | -- | -- | 2 |
| Total----- | 5 | 6 | 18 | 8 | 11 | 9 | 107 |
| SEMI-SKILLED OCCUPATIONS | | | | | | | |
| Ball player---- | -- | -- | -- | -- | -- | 1 | 2 |
| Carrier, mail-- | -- | -- | -- | -- | -- | -- | 1 |
| Fireman, city-- | -- | -- | 1 | -- | -- | -- | 1 |
| G-man----- | -- | -- | -- | -- | -- | -- | 1 |
| Navy----- | -- | 1 | 1 | -- | 1 | -- | 3 |
| Policeman----- | -- | -- | -- | -- | -- | -- | 1 |
| Restauranteur-- | -- | -- | -- | -- | -- | -- | 1 |
| Total----- | -- | 1 | 2 | -- | 1 | 1 | 10 |
| UNSKILLED OCCUPATIONS | | | | | | | |
| Laborer----- | -- | -- | -- | -- | 1 | 1 | 2 |
| UNDECIDED AND NO ANSWER---- | | | | | | | |
| | -- | 4 | -- | -- | 5 | -- | 21 |
| GRAND TOTAL-- | 12 | 14 | 25 | 10 | 22 | 15 | 300 |
| COLLEGE-PLAN TOTAL----- | | 51 | | | 47 | | 300 |

four-year college.

As was shown in Table 2 and also in Table 3, a total of 57 boys had intentions of taking up some line of engineering. Of this group, 41 were planning to go to college for four years; of the 41, 24 were planning to go to the junior college before going to a four-year college. Of the remaining 16 boys who had engineering intentions and who had not planned to go to college for four years, seven were planning to go to junior college only, while five were interested in attending the junior college if semi-professional or technical courses were given; the other three were undecided or wanted to prepare for radio engineering or television engineering, fields normally not given in college.

In connection with the lower professional occupations--of which teaching, oil operators, and architects constituted the occupations chosen by the largest number--37 out of 47 were planning to take four years of college work; 31 of the 37 were planning to go to junior college first.

Of the technical, clerical, and supervisory occupations, 15 out of 40 were planning to go to college for four years, while 13 others were planning on junior college only, and seven would take junior college work if pre-engineering or technical courses were offered.

The remaining five were undecided. Of the seven interested in the pre-engineering or technical courses, two were occupationally interested in air conditioning, one in aviation, and one in radio work.

Of the occupations represented by the skilled tradesmen and low-grade clerical workers--occupations chosen by slightly over a third of the entire number of 300 boys--only 22 had planned on attending college for four years. Of these 22, 17 were planning on going to the junior college first. Of the entire number, 28 were planning on going to junior college only, while an additional 29 would go to junior college if pre-engineering or technical courses were offered. It will be noted from the table that the occupations represented by those planning to go to the junior college, or who would go to the institution if the courses mentioned were given, include farmers, 13; automobile mechanics, 5; airplane mechanics, 4; general mechanics, 8; printers, 6; and woodworkers, 2. Of the entire 107 represented in this occupational group, a total of 28 were undecided, or were not going to college.

Of the relatively few boys--12 out of 300--who chose semi-skilled or unskilled occupations, seven were planning to go to junior college or would go if semi-professional or technical courses were offered.

College intentions as related to school achievement.--Table 4 shows that, of the full 300, 100 planned to go to junior college and then to some four-year college; 64 more expected to go to junior college only; and an additional 51 would go to junior college if pre-engineering and technical courses were offered. This represents a total of 215, or 71.6 per cent of the entire group of 300.

The table also shows the grade averages of the various college intention groups. For the group of 38 planning to go to some four-year college only, the grade average is 3.13 ($\pm .41$). On the other hand the grade average for the group of 100 going to junior college and then to some four year college is 3.03 ($\pm .41$) while the corresponding average for the 64 going to junior college only is 3.10 ($\pm .36$). It is evident, therefore, from the school achievement record that those groups planning to go to junior college are somewhat superior to the group planning to go to some four year college only. As to the fourth group, consisting of those who would go to junior college if certain courses were offered, the grade average for the group of 51 is 3.22 ($\pm .30$); this value shows that the group--as a whole--is inferior on the basis of school achievement. For the group of 47 who are undecided or not going to college the grade average is even more inferior,

Table 4.--INTENTIONS IN REGARDS TO COLLEGE OF 300 HIGH SCHOOL STUDENTS, AS RELATED TO SCHOOL ACHIEVEMENT

| College intentions | Good in both | Better in academic | Better in industrial | Total | | Grade average | (PE) probable error |
|---|--------------|--------------------|----------------------|--------|---------|---------------|---------------------|
| | | | | Number | Percent | | |
| To four-year college only----- | 13 | 13 | 12 | 38 | 12.7 | 3.13 | .416 |
| To junior college then to four-year college-- | 40 | 29 | 31 | 100 | 33.3 | 3.03 | .416 |
| To junior college only----- | 25 | 22 | 17 | 64 | 21.3 | 3.10 | .367 |
| To junior college if certain courses are given----- | 12 | 14 | 25 | 51 | 17.0 | 3.22 | .305 |
| Undecided or not going to college----- | 10 | 22 | 15 | 47 | 15.7 | 3.39 | .294 |
| Total----- | 100 | 100 | 100 | 300 | 100.0 | 3.15 | .380 |

being only 3.39 ($\pm .29$).

Occupational intentions as related to pre-engineering and technical service.--Table 5 and 6 were constructed to show the relation between the occupational intentions of those 179 high school boys whose occupational choice would involve junior college training along the lines either of pre-engineering or

technical service, and the college plans of these particular boys. The occupations listed have been selected from the longer list of Table 2 and 3.

As shown by Table 5, a total of 39 boys selected occupations from which training along pre-engineering lines would be needed in the junior college. Fourteen fields of engineering are represented in the occupational intentions of these 39 boys. For the entire group of boys, 31 are among those planning to attend the junior college, while five more would go to the junior college if pre-engineering and technical courses were offered.

Table 6 represents the corresponding situations for the occupations which would involve technical service training on the part of the junior college. A total of 116 boys selected the occupations listed in the table. The following are the occupations chosen by three or more of these boys: agriculture and farming, 29; general mechanics, auto mechanics, and airplane mechanics, 24; architect and drafting, 7; printers, 9; refrigeration and air conditioning, 4; aviators and pilots, 7; machinists, 3; and teachers of industrial arts, 3.

Of the 116, 62 are planning to attend junior college and 31 more would go if certain courses were offered; while 23 were undecided or were not going to college.

Table 5.--OCCUPATIONAL INTENTIONS AS RELATED TO PRE-ENGINEERING IN RELATION TO JUNIOR COLLEGE POSSIBILITIES

| Occupational intentions related to pre-engineering | Number planning to attend the junior college | Number that would attend junior college if certain courses were given | Number undecided or not going to college | Total |
|--|--|---|--|-------|
| ENGINEERING | | | | |
| General----- | 8 | 1 | -- | 9 |
| Aeronautical---- | -- | -- | -- | -- |
| Architectural--- | 2 | -- | 1 | 3 |
| Automobile----- | 2 | -- | -- | 2 |
| Chemical----- | 2 | -- | -- | 2 |
| Civil----- | 4 | 1 | -- | 5 |
| Construction---- | -- | -- | -- | -- |
| Diesel----- | 3 | -- | 1 | 4 |
| Electrical----- | 6 | -- | -- | 6 |
| Mechanical----- | 2 | 1 | -- | 3 |
| Mining----- | -- | -- | 1 | 1 |
| Petroleum----- | 1 | -- | -- | 1 |
| Radio----- | 1 | 1 | -- | 2 |
| Television----- | -- | 1 | -- | 1 |
| Total----- | 31 | 5 | 3 | 39 |

Table 6.--OCCUPATIONAL INTENTIONS RELATED TO TECHNICAL SERVICE IN RELATION TO JUNIOR COLLEGE POSSIBILITIES

| Occupational intentions | Number planning to attend the junior college | Number that would attend junior college if certain courses were given | Number undecided or not going to college | Total |
|-----------------------------|--|---|--|-------|
| Agriculture----- | 2 | -- | -- | 2 |
| Air conditioning | -- | 2 | -- | 2 |
| Architect----- | 5 | -- | -- | 5 |
| Navy----- | 1 | -- | -- | 1 |
| Aviator----- | 4 | 1 | -- | 5 |
| Business, auto-salvage----- | -- | -- | 1 | 1 |
| Carpenter----- | 1 | 1 | -- | 2 |
| Cobbler----- | -- | 1 | 1 | 2 |
| Contractor | | | | |
| Building----- | 1 | -- | -- | 1 |
| Construction-- | 1 | -- | -- | 1 |
| Draftsman----- | 1 | -- | -- | 1 |
| Electrician----- | 1 | -- | -- | 1 |
| Farm agent----- | 1 | -- | -- | 1 |
| Farmer----- | 16 | 4 | 7 | 27 |
| Floor sander---- | 1 | -- | -- | 1 |
| Geologist----- | 2 | -- | -- | 2 |
| Machinist----- | 1 | 2 | -- | 3 |
| Mechanic, | | | | |
| General----- | 3 | 6 | -- | 9 |
| Airplane----- | 2 | 3 | -- | 5 |
| Automobile---- | 3 | 3 | 4 | 10 |
| Militarist----- | 2 | -- | 1 | 3 |
| Oil field supplies----- | 1 | -- | -- | 1 |
| Oil field supt.-- | 1 | -- | -- | 1 |
| Oil field worker | -- | -- | 2 | 2 |
| Painter----- | 1 | -- | 1 | 2 |
| Pilot----- | 2 | -- | -- | 2 |
| Plumber----- | -- | 1 | -- | 1 |
| Printer----- | 2 | 4 | 3 | 9 |
| Projectionist--- | -- | -- | 1 | 1 |

Table 6.--OCCUPATIONAL INTENTIONS RELATED TO TECHNICAL SERVICE IN RELATION TO JUNIOR COLLEGE POSSIBILITIES (continued)

| Occupational intentions | Number planning to attend the junior college | Number that would attend junior college if certain courses were given | Number undecided or not going to college | Total |
|------------------------------|--|---|--|-------|
| Radio work----- | 1 | 1 | 1 | 3 |
| Refrigeration--- | 1 | -- | -- | 1 |
| Teacher, industrial arts---- | 3 | -- | -- | 3 |
| Telephone lineman | 1 | 1 | -- | 2 |
| Welder----- | -- | -- | 1 | 1 |
| Woodworker----- | 1 | 1 | -- | 2 |
| Total----- | 62 | 31 | 23 | 116 |

Subject interest and occupational intentions of boys undecided about college.--Tables 7 and 8 give the high school subject interests and the occupational intentions of the 47 boys who, on the questionnaire, stated that they were undecided about attending college or who left that part of the questionnaire blank.

As shown by Table 7, 34 of the 47 boys were especially interested in some industrial subject, the remaining 13 having interests scattered through the other school major courses.

Table 7.--SUBJECT INTEREST IN HIGH SCHOOL OF 47 HIGH SCHOOL STUDENTS THAT ARE UNDECIDED OR DO NOT PLAN TO GO TO COLLEGE

| Subject interest | Number | Percent |
|--------------------------|--------|---------|
| Industrial subjects----- | 34 | 72.3 |
| Social science----- | 2 | 4.2 |
| Commercial----- | 1 | 2.1 |
| English----- | 1 | 2.1 |
| Foreign language----- | 1 | 2.1 |
| Home economics----- | 1 | 2.1 |
| Mathematics----- | 1 | 2.1 |
| Music and art----- | 1 | 2.1 |
| Science----- | 1 | 2.1 |
| No subject interest----- | 4 | 8.5 |
| Total----- | 47 | 99.7 |

Table 8 indicates that 28 of the 47 were interested in occupations of the skilled tradesman and the low grade clerical workers group, while five were interested in some occupation of the technical, clerical, and supervisory occupation group, and five were either interested in some one of the professional or of the lower professional group of occupations.

As judged by the nature of the occupational choices it might be possible for the junior college to appeal to some of the 47 who were undecided about college, especially if pre-engineering and technical service courses were offered.

Table 8.--OCCUPATIONAL-INTENTION GROUPS AND GRADE AVERAGE OF 47 HIGH SCHOOL STUDENTS THAT ARE UNDECIDED OR DO NOT PLAN ON GOING TO COLLEGE

| Occupational- intention classifica- tion | Achievement groups | | | | | | Total | Percent (of 47) | |
|--|--------------------|------------------|--------------------------|------------------|----------------------------|------------------|--------|--------------------|------------------|
| | Good in both | | Better in academic | | Better in industrial | | | | |
| | Number | Grade average | Number | Grade average | Number | Grade average | Number | | Grade average |
| Professional-- | 1 | 2.50 | 1 | 3.81 | 2 | 3.38 | 4 | 3.27 | 8.5 |
| Lower profes- sional----- | -- | -- | 1 | 2.89 | -- | -- | 1 | 2.89 | 2.1 |
| Technical, clerical and supervisory occupations-- | 1 | 2.25 | 2 | 3.86 | 2 | 3.11 | 5 | 3.24 | 10.6 |
| Skilled trades- men and low- grade cler- ical workers-- | 8 | 2.90 | 11 | 3.59 | 9 | 3.64 | 28 | 3.41 | 59.5 |
| Semi-skilled occupations-- | -- | -- | 1 | 3.63 | 1 | 3.75 | 2 | 3.69 | 4.3 |
| Unskilled oc- cupations---- | -- | -- | 6 | 3.51 | 1 | 3.21 | 7 | 3.48 | 14.9 |
| Total----- | 10 | 2.79 | 22 | 3.57 | 15 | 3.52 | 47 | 3.34 | 99.9 |

Financial considerations as to college plans.--

At the time that the questionnaire was filled out each boy answering the questionnaire was asked whether he would need financial assistance if he went on to college. He was also asked to indicate the amount of the family income, if any, that would be available in aiding him in going to college. These questions were

asked to determine the extent to which lack of financial aid would act as a deterrent to college plans.

Data for those 138 pupils with four-year college intentions are presented in Table 9. As indicated by the table, 71 per cent of these boys--all of whom stated that they intended to go to college for four years--reported that they would need financial aid from some other source than that of the family.

As to the family income, 38 boys, or 27.5 per cent of the group, made no answer. For those answering the question 48, or approximately one-third of the entire group, stated that the yearly family income was less than \$1500; 42, or an almost equally large number, stated that the yearly family income was between \$1500 and \$2000; a much smaller group--consisting of ten boys-- stated that the family income was in the \$2000 to \$5000 range.

Summarization of data as to occupational intentions.--Before passing on to a discussion of the implications of the findings, the data already presented will be briefly summarized.

As to occupational intentions only 27 of the 300 boys wrote "undecided" or left the question blank. In connection with the occupations written in by the remaining 273 boys, 67 gave occupational intentions that came under the professional classification of

Table 9.--FINANCIAL STATUS IN REGARD TO OUTSIDE HELP, AND FAMILY INCOME, OF 138 HIGH SCHOOL PUPILS WITH FOUR-YEAR COLLEGE INTENTIONS, IN RELATION TO SCHOOL ACHIEVEMENT GROUPS

| | Good in both | Better in academic | Better in industrial | Total | Percent |
|--------------------------|--------------------|--------------------------|----------------------------|-------|---------|
| Need for financial help: | | | | | |
| Yes----- | 39 | 25 | 34 | 98 | 71 |
| No----- | 14 | 17 | 9 | 40 | 29 |
| Family income: | | | | | |
| not over \$500-- | 2 | 2 | 2 | 6 | 4.3 |
| \$500 to \$1000-- | 8 | 6 | 5 | 19 | 13.7 |
| \$1000 to \$1500 | 7 | 9 | 7 | 23 | 16.7 |
| \$1500 to \$2000 | 15 | 12 | 15 | 42 | 30.4 |
| \$2000 to \$5000 | 5 | 3 | 2 | 10 | 7.2 |
| No answer----- | 16 | 9 | 13 | 38 | 27.5 |

Brussel's revision of the Barr-Taussig scale. Of these, 57 were interested in some phase of engineering. While a total of 14 different fields of engineering were represented, from three to 15 boys selected each of the following: general, electrical, Diesel, architectural, and mechanical. The boys listing such interests were drawn largely either from the school-achievement group that was good in both academic and industrial subjects, or from the group inferior in academic but relatively good in industrial subjects. Of these 57 boys, 43 were planning to go to college for four years, with 24 of these planning to go to junior college first. Of the rest, seven were planning to go to junior college only, while five more were interested in attending junior

college if semi-professional courses were given.

A total of 116 boys selected occupations that were considered to involve the possibility of technical service training on the part of the junior college. The following were the occupations chosen by three or more of the 116 boys: agriculture and farming, 29; general mechanics, auto mechanics, and airplane mechanics, 24; architecture and drafting, 7; refrigeration and air conditioning, 4; aviators and pilots, 7; machinist, 3; and teachers of industrial arts, 3. Of the 116, 62 were planning to attend junior college and 31 more would go if certain proposed courses were offered. Of the 23 undecided about going to college, two-thirds had been especially interested in some industrial subject in their high school work.

Of the full 300, 100 planned to go to junior college and then to some four-year institution, 64 more expected to go to junior college only, and an additional 51 would go to junior college if the proposed courses were offered. This represents a total of 215, or 71.6 per cent of the entire group. As to grade averages, those planning to go directly to a four-year institution were slightly inferior to either the group planning to attend junior college first or the group going only to the junior college, but superior to the group who would go to junior college if the proposed

courses were offered, and definitely superior to the undecided group.

Of the 138 boys having the intention of going directly to some four-year institution, 71 per cent of the number stated that they would need financial help from some other source than that of the family. As further evidence of the same situation, two-thirds stated that the family income was less than \$2000.

The lack of family income and the need for financial help outside of the family can be expected to affect sufficiently the college plans of these boys so that many of them will attend the junior college rather than go directly to the four-year college.

Implications of findings in relation to a pre-engineering curriculum in the Hutchinson Junior College.

The preceding data will now be discussed in relation to their bearing on the desirability of offering a pre-engineering curriculum in the Hutchinson Junior College. In this connection it should be noted that the high school courses of woodwork, auto mechanics, printing, architectural and mechanical drawing are strictly on an industrial arts basis. The Junior College, though offering at present two courses in drawing, has no shop work of any kind. In fact, for this city of 32,000 population no pre-engineering, or technical service courses are available.

Of the 300 boys, 57 indicated that they were intending to enter some field of engineering, from three to 15 boys selecting each of the following: general, electrical, civil, Diesel, architectural, and mechanical. Of the 57, 24 were planning to go to the junior college only, either under the present curriculum or would go to the institution if pre-engineering and technical service courses were given. The boys choosing engineering as an occupation represented, in large part, those good in both academic and industrial subjects, or those better in industrial subjects.

Judging by the answers given, and the nature of the groups involved, it is evident that the professional training that would meet the needs of these boys--were they to go on with what they intend to do--should be on two levels. The higher level would demand a full four-year program of professional training, the lower level would give training that would terminate on a semi-professional basis. Boys with lower academic abilities conceivably would profit by the latter type of training, while such boys would be unlikely to succeed in the higher-level professional work.

Of the 57 boys intending to take up engineering work 19 stated their intention of going directly to some four-year institution. Because of financial factors previously mentioned it is to be expected that

a portion of the 19 who expect to enter a four-year institution to take engineering work will not be able to carry out their plans. It is also to be expected that some of these would attend the junior college if a pre-engineering curriculum were offered.

By comparing the number of boys intending to take up engineering, the number that would probably attend the junior college if a pre-engineering curriculum were offered, and the types of training needed, the following implications are indicated:

- 1. The junior college would be justified in introducing a pre-engineering curriculum on a professional training level provided it can be shown that a composite course can be developed that would meet the needs of several engineering fields.
- 2. There would be an advantage in having courses of a terminal nature giving semi-professional training introduced in the junior college program for those whose training should be on a lower professional level.

Implications of findings in relation to

technical service courses in the Hutchinson Junior

College.--Of the 300 high school boys used for the present study, half reported that some industrial subject had proved of special interest to them. For those boys who were better in industrial subjects than in academic subjects three out of five had found the industrial subjects of special interest. While the 300 boys may not have been entirely representative of all the 750 boys of the high school, yet it is safe to say

that a large proportion of all boys in the school find the industrial subjects of special interest. As adults it can be presumed that many of those boys will find their way into those occupations for which technical service courses could be expected to offer valuable training.

As shown specifically by Table 7, 140 of the 300 boys stated that they intended to take up occupations listed as being among those which could profit by technical service training on the part of the junior college. The following occupations were chosen by at least three of the boys: agriculture and farming, general mechanics, auto mechanics, airplane mechanics, architect, drafting, refrigeration and air conditioning, aviators and pilots, machinists, and teaching of industrial arts. Of the 140, 77 were planning to attend the junior college and 35 more would go if certain courses were offered, while 28 were undecided or were not going to college. Boys of all three school-achievement groups were represented.

Judging by the number involved and the type of occupations represented, the following implications are indicated:

1. Taken in connection with the semi-professional implication previously given, the junior college would be justified in introducing courses in its curriculum which would offer training on a terminal basis for agriculture and farming, mechanics, drafting, and junior engineers.

- 2. These courses should be presented on a semi-professional, college level.

C. NEEDS FOR ADDITIONAL TRAINING FROM THE STANDPOINT OF THE OCCUPATIONS REPRESENTED IN THE COMMUNITY

As a second point of attack upon the general problem as to whether there was a need in connection with the Hutchinson Junior College for pre-engineering, and for technical training courses, a survey was made of the occupations represented in the community.

An investigation of the city directory showed a total of 12,885 people who were listed in connection with some occupation. The writer listed all of the occupations given and recorded the number engaged in each occupation. (This material is given in the appendix as Appendix A.) He then classified the occupations under the main divisions of the Brussel's revision of the Barr-Taussig scale (38). As a further step, the full list of occupations was gone over to determine which could be expected to benefit from such training as pre-engineering and technical service would give. Such occupations and the number engaged in each are presented in Table 10.

As indicated by the table, six fields of engineering are represented with a total of 27 individuals involved. As to the occupations for which technical

Table 10.--OCCUPATIONS IN HUTCHINSON, KANSAS, RELATED TO PRE-ENGINEERING AND TECHNICAL SERVICE TRAINING

| PRE-ENGINEERING | | | |
|------------------------------------|--------|-------------------------------|--------|
| | Number | | Number |
| Civil engineer----- | 6 | Mechanical engineer--- | 4 |
| Consulting engineer--- | 3 | Oil field engineer---- | 4 |
| Electrical engineer--- | 3 | Total----- | 29 |
| Highway engineer----- | 9 | | |
| TECHNICAL SERVICE | | | |
| Carpenter----- | 272 | Projectionist----- | 11 |
| Mechanic----- | 258 | Woodworker----- | 7 |
| Attendant, filling station----- | 189 | Radio technician----- | 5 |
| Painter----- | 160 | Aviator----- | 4 |
| Driller----- | 140 | Brake man, auto----- | 4 |
| Farmer----- | 100 | Foundryman----- | 4 |
| Repairman----- | 98 | Mechanic, master----- | 4 |
| Electrician----- | 72 | Millwright----- | 4 |
| Contractor----- | 65 | Geologist----- | 3 |
| Machinist----- | 65 | Partsman, oil supplies | 3 |
| Oil operator----- | 43 | Surveyor----- | 3 |
| Plumber----- | 40 | Tool maker----- | 3 |
| Welder----- | 38 | Iron worker----- | 2 |
| Sheet metal worker and tinner----- | 34 | Trouble-shooter, lineman----- | 2 |
| Lineman----- | 17 | Inventor----- | 1 |
| Chemist----- | 16 | Refrigeration----- | 1 |
| Draftsman----- | 11 | Total----- | 1679 |

service might be expected to give valuable training, the table shows 33 occupations with 1679 people involved.

The occupations having the largest number employed are:

Carpenters, 272; mechanics, 258; filling-station attendants, 189; painters, 160; drillers, 140; farmers, 100; repairmen, 98; electricians, 72; machinists, 65; contractors, 65; oil operators, 43; plumbers, 40;

welders, 38; sheet metal and tanners, 34; linemen, 17; chemists, 16; and draftsmen, 11. The particular occupations named accounted for a total of 1618 employed people.

National figures for representative factory labor turn-over in 144 industries over a period of nine years from 1929 to 1937 inclusive, amounted to 4.32 per 100 employees (42). Such a turn-over factor applied to the 1618 employed in the specific occupations listed above would amount to 69 people. On the assumption that this factor would apply to the Hutchinson situation it is evident that 69 people would be needed to fill vacancies in these particular occupations every year.

In the absence of other training agencies--and Hutchinson has no trade school and the high school program is strictly on the industrial arts basis--it can be argued that a certain amount of technical training on a terminal basis should be given in the junior college to meet the occupational training needs of the community.

Of the occupations in the community for which technical service courses might be expected to give valuable training, many are closely comparable to those listed by the boys. Thus we have farming; mechanics, machinists, welder, sheet metal workers and tanners; draftsmen. In addition there are electricians; contractors, oil operators; chemists; filling station

attendants; and such tradesmen as carpenters, painters, and plumbers. It is from these occupations or occupational areas that a selection should be made for technical service purposes.

In summarizing the results of the present chapter, it is evident both from the standpoint of the occupational training needs of the boys of the community and from the standpoint of the occupations present in the community that pre-engineering and technical service courses could to advantage be added to the curriculum of the Hutchinson Junior College. The nature of such courses will be discussed in the following chapters.

Chapter V

NATURE OF PRE-ENGINEERING CURRICULUM FOR THE
HUTCHINSON JUNIOR COLLEGE

As was stated in the previous chapter, the Hutchinson Junior College would be justified, on the basis of the number of boys who would attend the Junior College and take up engineering as an occupation, in introducing a pre-engineering curriculum, provided that it can be shown that a composite course can be developed that would meet the needs of several engineering fields. The present chapter is intended to show that such a composite course can be developed. It also shows what the nature of such a course should be and gives cost figures in connection with the shop equipment necessary.

In connection with the data required for the present chapter the writer secured catalogs from various four-year colleges and universities that were known to give degrees in engineering. Two of these were Kansas institutions: University of Kansas, Lawrence, Kansas, and the Kansas State College, Manhattan, Kansas. Other institutions represented were the University of Nebraska, Lincoln, Nebraska; University of Missouri, Columbia, Missouri; University of Purdue, Lafayette,

Indiana; Colorado State College of Agriculture and
Mechanic Arts, Fort Collins, Colorado; Rensselaer
Polytechnic, Troy, New York, and the Case School of
Applied Science, Cleveland, Ohio.

Engineering fields represented in the courses
of various four-year institutions.--As shown by
Table 11 nine engineering fields are represented in
the courses offered in the eight institutions mentioned.
All of the institutions offer mechanical and electrical
engineering. At least half of the schools also offer
architectural, chemical and civil engineering. The rela-
tively new course in agricultural engineering is offered
in three of the institutions.

Shop subjects in relation to engineering
fields.--To determine the shop subjects most commonly
required in the engineering work, an investigation of
the catalog offerings was made. Table 12 shows the
various shop courses and the number of schools offering
these shop subjects in their engineering courses.

Table 11.--ENGINEERING FIELDS REPRESENTED IN THE COURSES OF EIGHT COLLEGES AND UNIVERSITIES

| ENGINEERING FIELDS | Nebraska University | Kansas University | Missouri University | Purdue University | Kansas State College | Colo. State College | Rensselaer Polytechnic | Case School of Applied Science | Total |
|--------------------|---------------------|-------------------|---------------------|-------------------|----------------------|---------------------|------------------------|--------------------------------|-------|
| Aeronautical | | | | | | | X | | 1 |
| Agricultural | X | | X | | X | | | | 3 |
| Architectural | X | X | | X | X | | X | | 5 |
| Chemical | X | | X | | X | | X | | 4 |
| Civil | X | | X | | X | X | | | 4 |
| Electrical | X | X | X | X | X | X | X | X | 8 |
| Industrial | | | | | | | X | | 1 |
| Mechanical | X | X | X | X | X | X | X | X | 8 |
| Metallurgical | | X | | | | | X | X | 3 |
| Total | 6 | 4 | 5 | 3 | 6 | 3 | 7 | 3 | 37 |

Source of information: Catalogs of institutions (4) (7) (21) (22) (26) (27) (31) (32)

Table 12.--THE FREQUENCY OF REQUIRED SHOP SUBJECTS IN
RELATION TO ENGINEERING FIELDS, FOR EIGHT
COLLEGES AND UNIVERSITIES

| SHOP SUBJECTS | ENGINEERING FIELDS | | | | | | | | | Total |
|---------------------|--------------------|--------------|---------------|----------|-------|------------|------------|------------|---------------|-------|
| | Aeronautical | Agricultural | Architectural | Chemical | Civil | Electrical | Industrial | Mechanical | Metallurgical | |
| Machine Shop | 1 | 2 | 2 | 2 | 1 | 8 | 1 | 8 | 3 | 28 |
| Forging | 1 | 2 | | 1 | | 2 | 1 | 2 | 1 | 10 |
| Welding | | | | | 1 | 2 | | 5 | | 8 |
| Pattern Making | 1 | | | 1 | | 1 | 1 | 2 | 1 | 7 |
| Foundry Practice | | 1 | | | | 2 | | 3 | | 6 |
| Steam & Gas Engines | | 1 | | 1 | 1 | 1 | | | | 4 |
| Metal Working | | | | | | 1 | | 1 | 1 | 3 |
| Motors, Farm | | 2 | | 1 | | | | | | 3 |
| Pipe Shop | | | | 1 | | | | | 1 | 2 |
| Farm Shop Work | | 1 | | | | | | | | 1 |
| Moulding | | | | | | | | 1 | | 1 |
| Total courses | 3 | 9 | 2 | 7 | 3 | 17 | 3 | 22 | 7 | 73 |
| Number of schools | 1 | 3 | 5 | 4 | 4 | 8 | 1 | 8 | 5 | 8 |

Source of information: Catalogs of institutions (4)
(7) (21) (22) (26) (27) (31) (32)

The greatest frequency of shop subjects comes in the electrical and mechanical fields. In terms of all fields of engineering the highest frequency is that of the machine shop. The next four, in order, are forging, welding, pattern making, and foundry practice.

Subjects of the first two years given in civil, electrical, agricultural, and mechanical engineering courses.--To determine whether there was any marked agreement between the various institutions as to their courses in the first two years, the writer selected the courses offered in civil, electrical, and mechanical engineering at Kansas State College, the University of Kansas, Colorado State College, and the University of Missouri, and the courses in agricultural engineering at Kansas State College and the University of Missouri. All of these schools are either in Kansas or in immediately adjoining states. In each case the courses referred to are compared with the present offerings of the Hutchinson Junior College.

Table 13 shows that there is a great uniformity among the four selected institutions in regard to the academic requirements for the various engineering courses and that these requirements are quite well met by the present Junior College offerings. The same is true for the drawing courses.

As to the courses which are especially related to the fields of engineering two are to be found

in the offerings of each school: Surveying, and engineering lectures and assemblies. Neither of these are, of course, offered by the Junior College.

As to the shop courses every institution offers either metal working or machine shop, or both. Two institutions offer forging, arc welding, and gas welding. One each offers farm shop and foundry production. No shop work is offered by the Junior College.

Table 13.--SUBJECTS OF FIRST TWO YEARS OF CIVIL, ELECTRICAL, AGRICULTURAL AND MECHANICAL ENGINEERING COURSES OF FOUR SELECTED INSTITUTIONS AS RELATED TO PRESENT HUTCHINSON JUNIOR COLLEGE PROGRAM (Continued)

| ACADEMIC | Kansas State College | Kansas U. | Colo. State | Missouri U. | Hutchinson Junior College |
|------------------------------------|-------------------------|-----------|-------------|-------------|---------------------------------|
| <u>DRAWING</u> | | | | | |
| Engr. drawing | meca | | | meca | |
| Mach. drawing | meca | mec | mec | | x |
| Lettering & F.H. drawing | | mec | | | x |
| Civil Engr. drawing | c | | | | |
| Descriptive Geo. <u>RELATED</u> | meca | mec | mec | meca | x |
| Engr. lectures & assemblies | meca | mec | m c | meca | |
| Surveying; Elem. R.R., Engr. | meca | mec | m c | m c | |
| Elec. circuits | | e | e | e | |
| Elec. machine cons. | e | | | | |
| Prs. of elec- tronics | e | | | | |
| Heat power | m | | | m a | |
| Mtrls. of const. | | | c | mec | |
| Steam mach. | | m | | | |
| Metals & alloys | m c | | | | |
| Agri. machines & const. | a | | | a | |
| El. of animal husb. | a | | | | |
| Field crops | | | | a | |

Source: Catalogs of institutions (7) (18) (20) (21) (25)

Note: The letters m, e, c, a, refer to the mechanical, electrical, civil and agricultural engineering courses, respectively.

Table 13.--SUBJECTS OF FIRST TWO YEARS OF CIVIL, ELECTRICAL, AGRICULTURAL AND MECHANICAL ENGINEERING COURSES OF FOUR SELECTED INSTITUTIONS AS RELATED TO PRESENT HUTCHINSON JUNIOR COLLEGE PROGRAM

| ACADEMIC | Kansas State College | Kansas U. | Colo. State | Missouri U. | Hutchinson Junior College |
|---------------------------------------|----------------------|-----------|-------------|-------------|---------------------------|
| Rhetoric | meca | mec | | meca | x |
| Eng. Comp. | | | mec | | |
| Public Speaking | | e | e | meca | x |
| Report writing | | e | | | |
| Algebra | meca | mec | | meca | x |
| Trigonometry | meca | mec | | meca | x |
| Anal. Geometry | ca | mec | | meca | x |
| Calculus | meca | mec | | meca | x |
| Mechanisms | me a | m | m | | |
| Statics | | mec | | mec | |
| Math. for Engrs. (2 yrs.) | | | mec | | |
| Chemistry, Inorg. Engr. Org. | meca | mec | mec | meca | x |
| Physics, Engr., Gen. | meca | mec | mec | meca | x |
| Geology, Gen. Engr. Phy. | a | c | | c | |
| Economics, Intro. Agri. Ind. | ec | mec | | meca | x |
| Current affairs American Ind. History | mec | | | | |
| Theor. Mech. SHOP | | | mec | | |
| Metal working | m | mec | me | | |
| Machine shop | | me | | me | |
| Gas welding | m a | | | | |
| Arc " | me | | mec | | |
| Forging | me | | mec | | |
| Foundry pro. | m a | | | | |
| Farm shop | | | | a | |

Recommended pre-engineering subjects.--Because of the relative similarity of the various courses offered in the four selected institutions, and because of the adequacy of the present academic and drawing courses of the Hutchinson Junior College, the introduction of the following courses are recommended for the pre-engineering course of the Junior College curriculum:

- Machine shop
- Welding, Oxyacetylene
- Welding, Arc
- Forging
- Surveying
- Engineering lectures

Cost of equipment in connection with proposed courses.--In order to determine the approximate cost of equipment for the shop courses it was assumed that each class should accomodate 15 students. By observation of several college shops and through the personal experience of the writer, the amount of equipment needed for a class of this size was determined. The costs of equipment were those given in current catalogs and verified by salesmen of two different supply companies.

Cost of machine shop equipment

Estimated cost of minimum amount of shop equipment for a machine shop. Shop to accomodate 15 students per hour.

| | |
|-------------------|-----------|
| 8 Machine Lathes | \$6250.00 |
| 5 -- 13" | |
| 2 -- 16" | |
| 1 -- 24" | |
| 1 Milling Machine | 500.00 |
| 1 Shaper | 475.00 |
| 1 Planer | 750.00 |

Cost of machine shop equipment (Continued)

| | |
|-------------------------|-----------|
| 1 Grinder | \$ 175.00 |
| 1 Power Saw | 75.00 |
| 1 Press | 75.00 |
| 1 Drill Press -- 22" | 225.00 |
| Misc. tools & equipment | 350.00 |
| | <hr/> |
| | \$8875.00 |

Cost of welding equipment

Estimated cost of minimum amount of shop equipment for acetylene and electric welding. Shop to accomodate 15 students per hour.

| | |
|------------------------------|-----------|
| 3 Arc welders | \$1295.00 |
| 8 Torch sets | 400.00 |
| 1 Gas generator | 175.00 |
| 4 Cutting torches | 60.00 |
| 2 Benches, work | 10.00 |
| 4 Benches, welding steel-top | 60.00 |
| 4 Vises | 50.00 |
| Oxygen Tanks | 40.00 |
| Misc. tools & equipment | 200.00 |
| | <hr/> |
| | \$2290.00 |

Cost of forge-shop equipment

Estimated cost of minimum amount of shop equipment for a forge shop. Shop to accomodate 15 students per hour.

| | |
|---------------------------|-----------|
| 10 Forges | \$600.00 |
| 4 Tables, work | 20.00 |
| 2 Vises, blacksmiths | 45.00 |
| 2 Vises, machinists | 55.00 |
| Forming equipment | 100.00 |
| 10 Anvils | 600.00 |
| Blacksmith's mandrel | 35.00 |
| Leveling blocks | 35.00 |
| Swage blocks | 40.00 |
| Misc. tools and equipment | 50.00 |
| | <hr/> |
| | \$1680.00 |

Cost of surveying equipment

Estimated cost of equipment for a class of 15 students

| | |
|------------|----------|
| 4 Transits | \$600.00 |
| 4 Rods | 40.00 |
| 4 Chains | 40.00 |
| | <hr/> |
| | \$680.00 |

The engineering lectures are for orientation purposes and to acquaint the students with developments in the engineering fields. They carry no cost other than institutional costs.

Chapter VI

NATURE OF TECHNICAL SERVICE COURSES FOR THE HUTCHINSON JUNIOR COLLEGE

In Chapter IV it was stated that the Junior College would be justified in introducing courses in its curriculum which would offer training on a semi-professional, college level for agriculture, mechanics, drafting, and junior engineers.

Semi-professional courses offered in junior colleges.--In arriving at some answer as to what courses should be given in the Hutchinson Junior College to meet training needs along the proposed technical service lines, the writer secured the catalogs of ten junior colleges. Institutions were selected which gave one or more semi-professional courses on a terminal basis. A large proportion of these schools are in California.

Table 14 shows the semi-professional courses given and the institutions involved. For tabulation purposes relatively equivalent courses have been considered together even where the names used for the courses differed. As is indicated by the table, the semi-professional courses offered by the individual institutions varied from one to a maximum of nine (Pasadena Junior College), with half of them having more than one course of

this nature.

Table 14.--SEMI-PROFESSIONAL COURSES OFFERED BY TEN JUNIOR COLLEGES

| | CHAFFEY J.C. Ontario, Calif. | JOLIET J.C. Joliet, Ill. | LOS ANGELES, J.C. Los Angeles, Calif. | NORTH TEXAS AGRIC. Arlington, Texas | PASADENA J.C. Pasadena, Calif. | SACRAMENTO J.C. Sacramento, Calif. | SAN FRANCISCO J.C. San Francisco, Cal. | SAN JOSE J.C. San Jose, Calif. | SCRANTON-KEYSTONE J.C. LaPlume, Pa. | TAFT UNION J.C. Taft, Calif. | TOTAL |
|---------------------------------|---------------------------------|-----------------------------|--|--|-----------------------------------|---------------------------------------|---|-----------------------------------|--|---------------------------------|-------|
| 1. Aero. Eng. | | | | x | x | x | | x | | | 7 |
| Aviation Eng. | x | | x | | | | | | | | 7 |
| " technology | | | | | x | | | | | | 7 |
| 2. Agri. mech. | | | | | | | | x | | | 1 |
| 3. Arch. Eng. | | | | | x | | | | | | 3 |
| Arch. Technology | | | | | x | | | | | | 3 |
| Arch. Course | | | x | | | | | | | | 3 |
| 4. Drafting | | | | | | | | x | | | 1 |
| 5. Civil Eng. | | | | | x | | | | | | 3 |
| " Technology | | | x | | x | | | | | | 3 |
| 6. Chemical course | | | | | | | | | x | | 1 |
| 7. Elec. Eng. | | | x | x | | | | | | | 4 |
| Elec. Technology | | | | | | x | | | | | 4 |
| Elec. course | | x | | | | | | | | | 4 |
| 8. Hotel & Restau- rant mgn. | | | | | | | x | | | | 1 |
| 9. Industrial Eng. | | | | | | | | x | | | 2 |
| " course | | | | | | | | | x | | 2 |
| 10. Mech. Eng. | | | x | x | | | | | | | 4 |
| " Technology | | | | | x | | | | | | 4 |
| " Course | | | | | x | | | | | | 4 |
| 11. Petroleum Tech. | | | | | | | | | | x | 1 |
| 12. Photography | | | x | | | | | x | | | 2 |
| 13. Radio & sound eng. | | | x | | | | | | | | 2 |
| Radio Engineering | | | | | | | | x | | | 2 |
| TOTAL- - - - | 1 | 1 | 7 | 3 | 9 | 1 | 1 | 6 | 2 | 1 | 32 |

Source of information: Respective catalogs (5) (20) (23) (28) (29) (33) (34) (35) (36) (39)

Criteria for selecting occupational areas in which training should be given.--To determine what occupations or occupational areas should be included in the technical service courses of the Hutchinson Junior College certain criteria were set up in the form of questions. These are:

1. Are there a sufficient number employed in this occupation or occupational area to justify its consideration in connection with technical service courses?
2. Can training for this occupation or occupational area be given on a lower level than that of the junior college?
3. If the training needed would be on the college level can the junior college give such training in two years or less?
4. Are the occupational training needs of this occupation or occupational area sufficiently similar to those of some other occupation or occupational area so that common equipment can be utilized?

Application of the criteria to the Hutchinson Junior College program.--In applying these criteria to those occupations selected by the boys, which also involved the possibility of technical service training on the part of the Junior College (Table 6) the following occupations were shown to have the highest frequency: Agriculture general, auto, and airplane mechanics; architecture and drafting; refrigeration and air conditioning; aviators and pilots; and machinists.

Of the occupations in the community for which

technical service courses might be expected to give valuable training (Table 10) many with a high frequency in terms of people employed are closely comparable to the occupations previously listed for the boys. Thus we have farmers; mechanics, machinists, welders, sheet metal workers and tanners; draftsmen. In addition we have electricians; contractors; oil operators; chemists; filling station attendants; and such tradesmen as carpenters, painters and plumbers. It is from these occupations or occupational areas that a selection should be made for technical service purposes.

As is indicated by the various junior college offerings (Table 14) semi-professional courses are at present being given in connection with some of these general fields. It can be assumed, therefore, that such fields as are represented by the junior college offerings would meet the second and third criteria.

On the basis of the above considerations the selection of mechanical technology, agricultural technology, and drafting (to include architectural technology) would seem logical for the technical service courses of Hutchinson Junior College.

Subjects in mechanical, drafting, and agricultural courses of junior colleges.--In connection with the determination of the subjects that should be included in the Junior College program for the three

technical service courses, there will be included at this point a listing of subjects given in the corresponding courses by certain junior colleges previously listed. These courses are shown in Table 15.

Table 15.--SUBJECTS IN MECHANICAL, DRAFTING (WITH ARCHITECTURE), AND AGRICULTURAL COURSES GIVEN IN SELECTED JUNIOR COLLEGES
(Only those subjects given in more than one school are listed)

| | Mechanical | | Drafting | | Agr. | | Total |
|--|---------------|------------------|----------------|-------------------|---------------|------------------|-------|
| | Pasadena J.C. | Los Angeles J.C. | No. Texas A.C. | San Jose State C. | Pasadena J.C. | Los Angeles J.C. | |
| <u>English:</u> | | | | | | | |
| Comp. & speech | | ✓ | ✓ | ✓ | ✓ | ✓ | 5 |
| Technical reports ✓ | | | | | ✓ | | 2 |
| <u>Mathematics:</u> | | | | | | | |
| Eng. or technical math. ✓ | | ✓ | ✓ | | ✓ | | 5 |
| Eng. analysis | | ✓ | | | | | 1 |
| <u>Science:</u> | | | | | | | |
| Ind. science | | | | | | | |
| Physics or Eng. physics | | ✓ | ✓ | | | ✓ | 3 |
| <u>Drawing:</u> | | | | | | | |
| Drafting, mach. drawing or mech. drawing ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | 7 |
| Freehand drawing & lettering | | | | | | ✓ | 2 |
| Color & design, or ind. arts des. | | | | ✓ | | ✓ | 3 |
| Descriptive geo. | | ✓ | | ✓ | | | 2 |
| <u>Surveying:</u> | | | | | | | |
| <u>Shop subjects:</u> | | | | | | | |
| Machine shop ✓ | | ✓ | ✓ | ✓ | | ✓ | 5 |
| Forging-welding | | | ✓ | | | ✓ | 2 |
| Woodwork & carpentry | | | | ✓ | | ✓ | 2 |

As is indicated in the table there is great uniformity in the courses as well as in the course offerings of the several junior colleges. Judging by subjects given in two or more of the courses shown, the following major subject fields are represented: English, mathematics, science, drawing, surveying, shop courses, related courses, and physical education. In connection with English, five of the courses include Composition and speech, while the other two offer Technical reports. In mathematics there is marked uniformity on a year or more of Engineering or Technical mathematics. Only three courses require Science, this science being usually referred to as Physics or Engineering physics.

In all courses drawing is required, appearing under various names. Freehand drawing and lettering, Color and design, and Descriptive geometry are also required in at least two of the courses. Surveying is a required subject in three courses. Shop subjects appear in all three engineering fields, with Machine shop appearing in five of the courses, Forging and welding in two, and Woodwork and carpentry in two.

As to the related courses there is less uniformity with only one course -- Materials of construction -- to be found in three of the courses. All of the schools require physical education, either with or without health or hygiene courses.

Recommended subjects for the technical service courses of the Hutchinson Junior College.--The writer feels that the subjects upon which there is the greatest agreement in the semi-professional courses that have been discussed, can be used as a logical basis for the selection of subjects for the corresponding courses of the Hutchinson Junior College. The shop subjects listed in Table 15 correspond in large part to those recommended by the writer for the pre-engineering curriculum. The single exception is that of woodwork and carpentry included in two of the courses given by the junior colleges. Since industrial arts work in the Hutchinson High School stresses woodwork the writer recommends that woodwork and carpentry be not offered in the Hutchinson Junior College, and that the high school work be required as a pre-requisite for technical service courses.

For the Hutchinson Junior College, the following subjects are recommended for two-year, terminal courses in mechanical technology, drafting (to include architectural technology), and agricultural technology:

| <u>Mechanical Technology</u> | <u>Drafting (to include Architectural technology)</u> | <u>Agricultural Technology</u> |
|---|---|---|
| English composition and speech | English composition and speech | English composition and speech |
| Engineering mathematics | Engineering mathematics | Technical mathematics |
| Industrial science (Physics, chemistry) | Industrial science (Physics, chemistry) | Industrial science (Physics, chemistry) |
| Drafting and machine design | Drafting | Drafting |
| Descriptive geometry | Freehand drawing and lettering Art, color and design | |
| Surveying | Surveying | Surveying |
| Machine shop and metal processes | Machine shop (Electives) | Machine shop |
| Forging and welding | | Forging and welding |
| Economics | Economics | Agricultural economics |
| Materials of construction | Materials of construction | Field crops |
| Industrial organization | Typewriting | Soils |

Since the shop equipment and surveying equipment (costs for which were given in the previous chapter) would be available for the technical service courses, no additional equipment costs for the subjects would be required. Since the drafting room of the Junior College is

already equipped, there would be no additional equipment cost for the drafting subjects, either of the pre-engineering curriculum or of the technical service courses.

Chapter VII

LIMITATIONS AND OTHER PROBLEMS

In the present study the nature and costs of the proposed pre-engineering curriculum and the technical service courses have been limited in several ways. The shop equipment costs have been given. No attempt, however, has been made to estimate the additional instructional costs that would be involved, as too many factors of an uncertain nature would be present.

While recommended subjects have been listed in connection with these courses, no attempt has been made to assign any particular number of credits to each subject nor to establish desirable content for the subjects. Administrative factors would affect the first; the second is beyond the realm of the present study.

No recommendations have been made as to any means for putting the proposed program into effect. This does not mean that the promotional or administrative features connected with any educational program are unimportant; the opposite is true. The writer believes that the present study can serve a highly important purpose, however, by pointing out to those in administrative positions what would be desirable of accomplishment.

Since the present program of the Hutchinson Junior College has been in effect for 11 years, with perhaps 2500 students enrolled in that period, the writer proposes that a study be made to determine the scholastic attainments and the kind of work that these students are now following, and to determine the relation that may exist between their occupational intentions at college entrance and their vocational realizations. Such a study would supplement the present one in several respects.

Chapter VIII

SUMMARY

The junior college has, in such a state as Kansas, remained primarily a community institution, though drawing students from the surrounding trade territory. The present study dealing with the Hutchinson Junior College, located at Hutchinson, Kansas, is an attempt to find what curriculum changes would be desirable that would permit it to act as a better training place not only for those young people of the community who would go on with professional training in the four-year college or university, but also for those needing courses on the college level but who would profit best if those courses were of a terminal nature. For convenience the problem has been confined to a study of the curriculum possibilities that exist along pre-engineering, and technical service training lines as they relate to occupations more or less open only to men.

The problem.--The problem undertaken has been:

What should constitute the pre-engineering, and technical service curricula that can be recommended for the Hutchinson Junior College, based on the vocational interests of high school students?

Subordinate questions to be answered are:

1. What are the occupational intentions of the boys of the Hutchinson High School and how are these related to the desirability of offering pre-engineering and technical service courses in the Junior College?
2. What are the occupations represented in the community and how are these related to the present educational program of the Junior College and to the proposed program?
3. What subjects should be added to the present Junior College curriculum to meet most nearly the requirements of the first two years of the four-year engineering institutions?
4. What subjects should be added to the present curriculum along technical service lines which could be defended on the basis of cost and service to the largest number?

By a pre-engineering curriculum is meant those courses required in the first two years of the four-year institution, which, given in the junior college, will meet the requirements of the four-year institutions. A technical service curriculum consists of courses designed to meet the training needs of occupational fields that have standards of competence considerably above those developed by present high school and trade school training but below that developed by the four-year professional schools; some writers in the junior college field use the term "semi-professional" for such offerings.

At the present time (1939) Hutchinson Junior College has an enrollment of approximately 450 students with courses in English, modern languages, mathematics, physical sciences, biological sciences, philosophy,

education, music, home economics, drawing, typing, and accounting. No shop subjects or surveying are offered. While the term "engineering" appears in the catalog, the reference is to a curriculum of academic subjects in elementary and machine drawing and descriptive geometry.

A brief summary of the findings, from 300 boys from the Hutchinson High School, shows that 152 indicated that they were especially interested in some industrial subject given in high school, such subjects having major interest for from 37 to 60 per cent of the three school-achievement groups.

As to occupational intentions only 27 of the 300 wrote "undecided" or left the question blank. In connection with the occupations written in by the boys, a classification was made according to the Brussel's revision of the Barr-Taussig scale (38). Of the 300 boys, 67 gave occupational intentions that came under the professional classification. Of these, 57 were interested in some phase of engineering, with 14 fields of engineering represented. The boys listing such interests were largely drawn either from the school-achievement group that was good in both academic and industrial subjects, or from the group inferior in academic but relatively good in industrial subjects. All but two of the 57 thought that college training would be of value to them in their vocational choice.

Of the 57, 43 were planning to go to college for four years, with 24 of these planning to go to junior college first. Of the rest, seven were planning to go to junior college only, while five were interested in attending junior college if semi-professional courses were given.

A total of 116 boys selected occupations that were considered to involve the possibility of technical service training on the part of the junior college. The following are the occupations chosen by three or more of the boys: agriculture and farming, 29; general mechanics, auto mechanics, and airplane mechanics, 24; architecture and drafting, 7; refrigeration and air-conditioning, 4; aviators and pilots, 7; machinists, 3; and teachers of industrial arts, 3. Of the 116, 62 were planning to attend junior college and 31 more would go if the mentioned courses were offered. Of the 23 undecided about going to college, two-thirds had been especially interested in some industrial subject in their high school work.

Of the full 300, 100 planned to go to junior college and then to some four-year college, 64 more expected to go to junior college only, and an additional 51 would go to junior college if the courses mentioned were offered; this represents a total of 215, or 71.6 per cent of the entire group. As to grade averages, those planning to go directly to a four-year college

were slightly inferior to either the group planning to attend junior college first, or those going only to the junior college, but superior to the group who would go to junior college with certain courses offered, and definitely superior to the undecided group.

Implications of the findings.--The following implications are indicated as to a pre-engineering curriculum for the Hutchinson Junior College:

1. The Junior College would be justified in introducing a pre-engineering curriculum on a professional training level provided it can be shown that a composite course can be developed that would meet the needs of several engineering fields.
2. There would be an advantage in having courses of a terminal nature giving semi-professional training introduced in the Junior College program for those whose training should be on a lower professional level.

The following implications are indicated in relation to technical service courses:

1. Taken in connection with the semi-professional implication previously given, the Junior College would be justified in introducing courses in its curriculum which would offer training on a terminal basis for agriculture and farming, mechanics, drafting, and junior engineers.
2. These courses should be presented on a semi-professional, college level.

Training needs from standpoint of community occupations.--To indicate whether the occupational intentions of the boys were in line with the training

needs as represented by the occupations of the community the types of occupations of the community were determined by listing those given for the different people of the city directory, classifying the occupations according to the Brussel's revision of the Barr-Taussig scale (38), and determining those which would involve technical service training such as the junior college might offer. The particular occupations so found accounted for a total of 1679 employed people. These occupations corresponded closely, in general, to those which the boys stated that they intended to follow and so gave extra support to the implications previously listed.

A pre-engineering curriculum.--To determine whether a pre-engineering curriculum could be developed which could act as a composite course and would meet the several engineering fields, the writer secured catalogs of eight four-year engineering institutions and investigated the courses offered in nine engineering fields. In terms of all fields of engineering the highest frequency for shop courses were for machine shop, forging, welding, pattern making, and foundry practice.

By comparison of the courses offered in civil, electrical, agricultural, and mechanical engineering in four institutions, either of Kansas or of

immediately adjoining states, and comparing them with what was already available in the courses of the Hutchinson Junior College it was shown that a pre-engineering curriculum to meet the needs for these engineering fields could be met by adding machine shop, oxy-acetylene and arc welding, forging, surveying, and engineering lectures to the present junior college program. Costs for shop equipment for classes of 15 persons were secured for the subjects listed.

Technical service courses.---To determine the possible courses for technical service courses along the lines of agriculture and farming, mechanics, and drafting (to include architecture), and given on a semi-professional basis, the writer secured catalogs of ten junior colleges offering semi-professional courses along such lines. A comparison of the courses, taken in connection with shop requirements previously assigned to the pre-engineering curriculum, indicated that a course for the three semi-professional lines mentioned above could be developed that would involve no additional shop equipment costs. These courses would include offerings in English, mathematics, science, drawing, surveying, shop subjects, related subjects, and physical education.

APPENDIX

Page

| | |
|--|--|
| Appendix A. Occupational classification of people employed in Hutchinson, Kansas - - - - - | |
| Appendix B. Card used for recording high school pupils subject and grade averages | |
| Appendix C. Junior college terminal courses - - | |
| Bibliography - - - - - | |

LIBRARY
 COLORADO STATE COLLEGE OF A. & M. A.
 FORT COLLINS, COLORADO

Appendix A.--OCCUPATIONAL CLASSIFICATION OF PEOPLE
EMPLOYED IN HUTCHINSON, KANSAS
(12,844 people involved)

| HIGH PROFESSIONAL AND EXECUTIVE OCCUPATIONS | | LOWER PROFESSIONAL & LARGE BUSINESS OCCUPATIONS | |
|--|-----|--|-----|
| Attorney | 51 | Accountant | 24 |
| Chemist | 16 | Agent, farm | 1 |
| Engineer, Civil | 6 | Architect | 14 |
| " Consulting | 3 | Artist | 7 |
| " Electrical | 3 | Auditor | 17 |
| " Highway | 9 | Author | 4 |
| " Mechanical | 2 | Banker | 1 |
| " Oil field | 4 | Broker | 4 |
| Geologist | 3 | Chiropodist | 3 |
| Governor, State | 1 | Compositor | 29 |
| Judge | 4 | Dentist | 30 |
| Mayor, City | 2 | Designer | 4 |
| Physician | 38 | Dietitian | 1 |
| Postmaster | 2 | Evangelist | 9 |
| Roadmaster, R.R. | 1 | Historian | 1 |
| School Principal | 12 | Inventor | 1 |
| Seismographer | 1 | Minister | 58 |
| | | Mortician | 13 |
| | | Oil operator | 43 |
| | | Osteopath | 7 |
| | | Pharmacist | 23 |
| | | Practitioner | 3 |
| | | President of firms | 117 |
| | | Receiver | 1 |
| | | Superintendent | 86 |
| | | Supervisors, business | 28 |
| | | Surveyors | 3 |
| | | Teacher, dancing | 5 |
| | | " expression | 1 |
| | | " music | 32 |
| | | " school | 294 |
| | | Technician | 6 |
| | | Traffic manager | 11 |
| | | Transportation commissioner | 1 |
| | | Veterinary | 5 |
| | | Yardmaster, R.R. | 3 |
| Totals - - - | 158 | | 900 |

Appendix A.--OCCUPATIONAL CLASSIFICATION OF PEOPLE
EMPLOYED IN HUTCHINSON, KANSAS
(12,844 people involved)

| TECHNICAL, CLERICAL & SUPERVISORY OCCUPATIONS | | SKILLED TRADESMEN & LOW- GRADE CLERICAL WORKERS | |
|--|-----|--|-----|
| Abstractor | 7 | Actress | 2 |
| Adjuster, Claims | 15 | Agent, Misc. | 19 |
| Advertiser | 19 | Amusements | 7 |
| Agent, Freight & ticket | 17 | Appraiser | 1 |
| " insurance | 85 | Assessor | 2 |
| " oil | 9 | Attendant, filling station | 189 |
| Announcer | 4 | Awning hanger | 2 |
| Assistant, Dr. | 22 | Baker | 50 |
| " Office | 8 | Barber | 110 |
| Astrologer | 1 | Battery man | 6 |
| Auctioneer | 2 | Belt man, salt plant | 2 |
| Aviator | 4 | Beverage maker | 4 |
| Bertillion expert | 1 | Bill poster | 3 |
| Bookkeeper | 256 | Binder, book | 6 |
| Broker, cream | 1 | Blacksmith | 13 |
| " pawn | 1 | Blender, flour mill | 3 |
| Buyer, cattle | 5 | Body builder | 1 |
| " Hardware | 1 | Boilermaker | 5- |
| " Misc. | 12 | Brake liner | 2 |
| Case worker | 10 | Brakeman, auto. | 4 |
| Cashier | 92 | Bricklayer | 17 |
| Clerk, law | 1 | Bulker | 2 |
| Clothier | 3 | Butcher | 7 |
| Commissioner, city | 4 | Buttermaker | 10 |
| " county | 4 | Cabinet maker | 17 |
| " street | 1 | Candy maker | 1 |
| Conductor, R.R. | 13 | Canvas maker | 1 |
| Confectioner | 2 | Carman, R.R. | 24 |
| Contractor, brick | 1 | Carpenter | 272 |
| " building | 41 | Cateress | 1 |
| " concrete | 6 | Cement worker | 20 |
| " drilling | 3 | Checker, salt plant | 4 |
| " electric | 4 | Cleaner, dry | 25 |
| " general | 6 | " rug | 4 |
| " rig | 2 | Clerk, filing | 1 |
| " road | 1 | " mailing | 17 |
| " sewer | 1 | " office | 138 |

Appendix A.--OCCUPATIONAL CLASSIFICATION OF PEOPLE
EMPLOYED IN HUTCHINSON, KANSAS
(12,844 people involved)

| TECHNICAL, CLERICAL & SUPERVISORY OCCUPATIONS (Continued) | | SKILLED TRADESMEN & LOW- GRADE CLERICAL WORKERS (Continued) | |
|---|-----|---|-----|
| Draftsman | 11 | Clerk, shipping | 35 |
| Editor | 2 | " store | 751 |
| Enumerator | 1 | Cobbler | 30 |
| Field man, oil | 8 | Cooper | 4 |
| Finisher, photo | 1 | Cosmetologist | 1 |
| Floor man | 6 | Dairyman | 18 |
| Foreman | 214 | Decorator, Intr. | 25 |
| Gauger | 4 | " window | 4 |
| Glass bender | 2 | Dispatcher | 3 |
| Gunsmith | 1 | Dressmaker | 56 |
| Instrument man | 3 | Driller | 140 |
| Jeweler | 6 | Electrician, auto. | 18 |
| Librarian | 10 | " power & light | 29 |
| Loans | 6 | " telephone | 2 |
| Lumberman | 3 | " misc. | 23 |
| Mgrs. of concerns | 769 | Employees, Govt. | 4 |
| Manufacturers | 6 | Engineers, heat plant | 14 |
| Mech. master | 4 | Engineers, misc. | 30 |
| Miller | 15 | " radio | 3 |
| Nurse | 107 | " railway | 29 |
| Optician | 9 | " stationary | 26 |
| Optometerist | 6 | Farmer | 100 |
| Comp. operator | 1 | Feeder | 2 |
| Grain, operator | 2 | Filter, vinegar works | 1 |
| Telegraph operator | 24 | Finisher, cement | 15 |
| Partsman, oil supplies | 3 | " laundry | 5 |
| Pastuerizer | 2 | " silk | 5 |
| Pattern maker | 2 | Fireman, misc. | 5 |
| Photographer | 17 | Fireman, R.R. | 20 |
| Produce man | 2 | Forester | 1 |
| Promoter | 1 | Foundryman | 4 |
| Radio technician | 5 | Furrier | 1 |
| Realtor | 76 | Gardner | 57 |
| Refrigeration | 1 | Glazier | 6 |
| Register of deeds | 1 | Golf professional | 4 |
| Repairman, piano | 1 | Grinder | 8 |
| " watch | 1 | Grainer | 6 |
| Reporter | 5 | Grocer | 70 |

Appendix A.--OCCUPATIONAL CLASSIFICATION OF PEOPLE
EMPLOYED IN HUTCHINSON, KANSAS
(12,844 people involved)

TECHNICAL, CLERICAL &
SUPERVISORY OCCUPATIONS
(Continued)

| | |
|-------------------------------|-----|
| Routeman | 10 |
| Sargent army | 1 |
| Scout executive | 2 |
| Sec'rs. to business | 102 |
| Showman | 1 |
| Stenographers | 244 |
| Sterotypist | 3 |
| Teller, bank | 20 |
| Timekeeper | 13 |
| Treasurer | 23 |
| Tool maker | 3 |
| Trouble shooter, telephone | 2 |
| Umpire, ball | 1 |
| Watch maker | 8 |
| Weigh master | 4 |
| Weather observer, govt. | 2 |
| Wholesaler | 74 |
| Writer, continuity | 2 |
| " script | 1 |

SKILLED TRADESMEN & LOW-
GRADE CLERICAL WORKERS
(Continued)

| | |
|-----------------------------|-----|
| Grower, bakery | 4 |
| Groundman, oil fld. | 14 |
| Hardware man | 1 |
| Hatcheryman | 4 |
| Hides, dealer | 1 |
| Horseshoer | 1 |
| Housemover | 3 |
| Ice cream maker | 1 |
| Inspectors | 34 |
| Installers | 6 |
| Interviewer | 3 |
| Investigator | 1 |
| Iron worker | 2 |
| Knitter | 1 |
| Lather | 6 |
| Leather gds. maker | 2 |
| Lineman | 17 |
| Linoleum layer | 3 |
| Machinist | 65 |
| Maintenance man | 5 |
| Matress maker | 3 |
| Meat cutter | 55 |
| Mechanic | 258 |
| Meter man | 16 |
| Milliner | 5 |
| Millwright | 4 |
| Modiste | 1 |
| Motorman | 4 |
| Moulder | 10 |
| Newspaper, plant workers | 12 |
| Nurseryman | 4 |
| Operator, hoister | 2 |
| " linotype | 18 |
| " pan | 1 |
| " steam shovel | 2 |
| " tele. | 143 |
| Orchardist | 1 |
| Painter | 160 |

Totals - - - 2519

Appendix A.--OCCUPATIONAL CLASSIFICATION OF PEOPLE
EMPLOYED IN HUTCHINSON, KANSAS
(12,844 people involved)

TECHNICAL, CLERICAL &
SUPERVISORY OCCUPATIONS

SKILLED TRADESMEN & LOW-
GRADE CLERICAL WORKERS
(Continued)

| | |
|---------------------|-----|
| Paperhanger | 20 |
| Piano tuner | 5 |
| Pipe fitter | 5 |
| Pipe line wkr. | 5 |
| Plasterer | 35 |
| Plumber | 40 |
| Poultryman | 7 |
| Presser, cleaner | 22 |
| Pressman, newspaper | 17 |
| " milling | 1 |
| Printer | 25 |
| Processor | 2 |
| Projectionist | 11 |
| Repairman, elec. | 12 |
| " mechanic | 33 |
| " misc. | 49 |
| " radio | 4 |
| Roadman, R.R. | 1 |
| Rodman, oil fld. | 1 |
| Roofer | 14 |
| Ruler | 1 |
| Salesman | 801 |
| Saltmaker | 4 |
| Sampler | 7 |
| Sander | 8 |
| Sausage maker | 9 |
| Saw filer | 2 |
| Serviceman | 47 |
| Sheet metal wkr. | 27 |
| Sign hanger | 6 |
| Smoother, elevator | 3 |
| Splicer | 3 |
| Spotter, cleaner | 2 |
| Steel wkr. | 2 |
| Stillman | 1 |
| Steam fitter | 1 |
| Stockman, supplies | 24 |
| Stone cutter | 5 |
| Switchman | 13 |
| Tailor | 14 |
| Tank bldr. | 3 |

Appendix A.--OCCUPATIONAL CLASSIFICATION OF PEOPLE
EMPLOYED IN HUTCHINSON, KANSAS
(12,844 people involved)

TECHNICAL, CLERICAL &
SUPERVISORY OCCUPATIONS

SKILLED TRADESMEN & LOW-
GRADE CLERICAL WORKERS
(Continued)

| | |
|-----------------------------|----|
| Taxidermist | 1 |
| Tester, cream | 9 |
| Thresher | 1 |
| Tinner | 7 |
| Towerman, R.R. | 9 |
| Treater, creamery | 3 |
| Tree surgeon | 4 |
| Trimmer, auto | 4 |
| Type setter, composition | 4 |
| Upholster | 7 |
| Vatman, salt plant | 1 |
| Vulcanizer | 5 |
| Weather stripper | 4 |
| Welder | 38 |
| Woodworker | 7 |

Totals - - -

2519

4816

Appendix A.--OCCUPATIONAL CLASSIFICATION OF PEOPLE
EMPLOYED IN HUTCHINSON, KANSAS
(12,844 people involved)

| SEMI-SKILLED OCCUPATIONS | | UNSKILLED OCCUPATIONS | |
|------------------------------------|-----|-----------------------|------|
| Antique collector | 1 | Caddy | 2 |
| Apprentices | 7 | Carrier, paper | 7 |
| Army | 1 | Car washers | 21 |
| Attendant, auto | 2 | Cleaner, street | 9 |
| " misc. | 16 | Dispensers, soda | 5 |
| Baggageman | 9 | Dockman | 24 |
| Ball player | 8 | Doorman | 4 |
| Bartender | 3 | Employees, city | 2 |
| Baths | 4 | " laundry | 19 |
| Bell hop | 16 | Flagman | 14 |
| Billiards | 4 | Garbage man | 2 |
| Bolter, rig | 3 | Helper | 212 |
| Boner | 3 | Hod carrier | 1 |
| Bottler | 15 | Houseman | 1 |
| Candler | 3 | Laborer, common | 1412 |
| Caretaker | 10 | Loader | 10 |
| Carrier, post off. | 34 | Mill hand | 9 |
| Checker, laundry | 12 | Pin setter | 1 |
| " misc. | 2 | Polisher | 1 |
| Cleaner, chimney | 1 | Sheep herder | 1 |
| Collector | 22 | Shoe shiner | 7 |
| Cook | 110 | Sweepers, street | 7 |
| Custodian | 12 | Window cleaner | 1 |
| Dealer, Watkins products | 1 | | |
| Deliveryman | 32 | | |
| Demonstrators, cooking utensils | 1 | | |
| Detective, city | 4 | | |
| Drivers, bus, truck, taxi | 492 | | |
| Dipper, candy co. | 8 | | |
| Employees, auto agency | 5 | | |
| Emp. cold storage and ice | 50 | | |
| Emp. construction co. | 4 | | |
| Emp. mail order | 5 | | |
| Emp. misc. | 94 | | |
| Emp. store | 15 | | |
| Fencebuilder | 1 | | |
| Filler, bottling co. | 8 | | |
| Totals - - - | | | 1772 |

Appendix A.--OCCUPATIONAL CLASSIFICATION OF PEOPLE
EMPLOYED IN HUTCHINSON, KANSAS
(12,844 people involved)

| SEMI-SKILLED OCCUPATIONS (Continued) | UNSKILLED OCCUPATIONS |
|---|-----------------------|
| Fireman, city | 48 |
| Folder | 3 |
| Governess | 1 |
| Grader | 7 |
| Guards, state reformatory | 36 |
| Horseman | 3 |
| Hostetler | 2 |
| Housekeeper | 35 |
| Huckster | 4 |
| Iceman | 1 |
| Ironer | 10 |
| Janitor | 77 |
| Junk dealer | 10 |
| Laborer, skilled | 7 |
| Labeler | 3 |
| Laundress | 29 |
| Maid | 239 |
| Mailer | 1 |
| Manicurist | 1 |
| Marker | 2 |
| Matron | 4 |
| Mender | 1 |
| Messenger | 16 |
| Milkers | 2 |
| Mixer | 4 |
| Operator, beauty | 103 |
| " dryer | 10 |
| " elevator | 15 |
| " evaporator | 1 |
| " grader | 4 |
| " machine | 34 |
| " misc. | 9 |
| " pump | 4 |
| " tractor | 2 |
| Packer | 65 |
| Peddler | 1 |
| Philatelist | 2 |
| Picker | 1 |
| Plant man | 18 |
| Policeman | 31 |
| Porter | 62 |

Appendix A.--OCCUPATIONAL CLASSIFICATION OF PEOPLE
EMPLOYED IN HUTCHINSON, KANSAS
(12,844 people involved)

| SEMI-SKILLED OCCUPATIONS (Continued) | UNSKILLED OCCUPATIONS | |
|--|-----------------------|------------|
| Poultry dresser | 19 | |
| Quilter | 1 | |
| Restaurateur | 110 | |
| Roll tender | 3 | |
| Rooming house opr. | 39 | |
| Sackman, bag co. | 4 | |
| Sand pumper | 3 | |
| Sexton | 1 | |
| Shaker, salt plant | 2 | |
| Sheriff & deputies | 8 | |
| Solicitor | 5 | |
| Sorter | 11 | |
| Teamster | 8 | |
| Trucker | 85 | |
| Tumbler | 1 | |
| Usher | 11 | |
| Waiter & waitress | 321 | |
| Warehouseman | 11 | |
| Washman, laundry | 2 | |
| Watchman | 50 | |
| Wrapper | 17 | |
| Wrecker, auto salvage | 8 | |
| Yardman | 34 | |
| | <hr/> | |
| Totals - - - | 2680 | <hr/> 1772 |
| High professional and executive occupations - - | 158 | 1.2 |
| Low professional and large business occupa- tions - - - - - | 900 | 7.0 |
| Technical, clerical and supervisory occupa- tions - - - - - | -2519 | 19.6 |
| Skilled tradesmen and lowgrade clerical workers - - - - - | -4816 | 37.4 |
| Semi-skilled occupations - - - - - | -2680 | 20.8 |
| Unskilled occupations - - - - - | -1772 | 13.7 |
| | | <hr/> 99.7 |

Appendix B.--CARD USED FOR RECORDING HIGH SCHOOL PUPILS
SUBJECT AND GRADE AVERAGES

Name _____ CLASS _____

ACADEMIC SUBJECTS:

INDUSTRIAL SUBJECTS

| | | | | |
|-------------|---|------------------------|---------|---------|
| A - - - - - | : | AUTO.MECH. - - - - - | A _____ | D _____ |
| | | | B _____ | F _____ |
| B - - - - - | : | _____ | C _____ | |
| C - - - - - | : | WOODWORK - - - - - | A _____ | D _____ |
| | | | B _____ | F _____ |
| D - - - - - | : | _____ | C _____ | |
| F - - - - - | : | MECH.DRAWING - - - - - | A _____ | D _____ |
| | | | B _____ | F _____ |
| | : | _____ | C _____ | |
| | : | PRINTING - - - - - | A _____ | D _____ |
| | | | B _____ | F _____ |
| | : | _____ | C _____ | |

C. Junior College terminal courses

AERONAUTICS

SAN JOSE STATE COLLEGE
San Jose, California

PURPOSE:

1. To prepare the student for appointment as a flying cadet, U.S.Army Air Corps, without examination.
2. To give the first two years of the required four-year preparation for the Naval Air Service School at Pensacola.
3. To train for entrance into commercial aviation.

ARMY REQUIREMENTS:

Candidate must be unmarried, male, a citizen of the United States, of excellent character, of sound physique and excellent health, and must have completed at least two years of recognized college work. Age must be between 20 and 27 inclusive.

NAVY REQUIREMENTS:

Similar to the Army's except that the applicant must have a college A.B. This technical course furnished the first two years of such a course.

U.S. DEPT. OF COMMERCE REQUIREMENTS:

For the aircraft master mechanic's license, two years of Aeronautics laboratory are required.

FIRST YEAR

- Physical Education
- Hygiene
- Elements of Psychology
- Principles of Aeronautics
- Aerology
- Navigation
- Aeronautics Laboratory
- Intermediate Algebra
- Trigonometry
- Analytic Geometry
- Introduction to Radio
- English Composition or Speech
- Electives

C. Junior College terminal courses

AERONAUTICS
(Continued)

SAN JOSE STATE COLLEGE
San Jose, California

SECOND YEAR

- Physical Education
- American Constitution
- Advanced Aero. Laboratory
- General Physics
- Radio Code
- Woodwork
- Machine Shop
- Elementary Photography
- Aircraft Welding
- Aircraft Sheet Metal
- Electives

AERONAUTICAL

NORTH TEXAS AGRICULTURAL COLLEGE
Arlington, Texas

PURPOSE:

INDUSTRIAL ENGINEERING COURSES--The courses in industrial engineering have been developed to fill a definite need. The majority of the positions are open in the mechanical field, and from the courses offered a young man should be able to pick the work he would prefer to do.

These are terminal courses, and the student completes his engineering work in this institution. Industrial courses should not be taken by students who wish to transfer to a senior institution.

FIRST YEAR

- Aircraft Repair
- Primary Engine Assembly
- Aircraft Instruments
- Aircraft Welding
- Machine Shop
- Mathematics
- Business Correspondence
- Drafting
- Industrial Science
- Aircraft Woodwork
- Engine Accessories
- Dynamics
- Social Science
- Military Science

SECOND YEAR

- Aircraft Repair
- Engine Overhaul
- Dynamics
- Machine Shop
- Mathematics
- Social Science
- Drafting
- Radio
- Business Organization
- Military Science

AERONAUTICS

SACRAMENTO JUNIOR COLLEGE
Sacramento, California

PURPOSE:

For students whose formal education will end with the junior college. This is vocational training along semi-professional lines, designed to lead directly to placement, and planned after careful consideration of the employment opportunities of the area served.

FIRST YEAR

- Orientation
- Physical Education
- American Institutions
- Aeronautics 1
- Aeronautics 50
- English
- Hygiene
- Aeronautics 60

SECOND YEAR

- Physical Education
- English
- Aeronautics 70
- Aeronautics 80
- Electives

AGRICULTURAL MECHANICS

SAN JOSE STATE COLLEGE
San Jose, California

PURPOSE:

To provide college training in the mechanical phases of modern farming.

THE LOCAL NEED:

The college is located in the heart of the fertile Santa Clara Valley, famous as one of California's fruit-growing centers. Much of this farming is done with modern machinery; hence, the need for this sort of a course.

FIRST YEAR

Physical Education
Elements of Psychology
Woodwork
Carpentry
Mechanical Drawing
Automotive Mechanics
Hygiene
Electives

SECOND YEAR

Physical Education
American Constitution
English Composition or Speech
Elements of Electricity
Machine Shop
Farm Machinery
Pumps and Irrigation
Forging and Welding
Cement and Concrete
Plumbing and Pipefitting
Electives

ARCHITECTURE

LOS ANGELES CITY COLLEGE
(Los Angeles Junior College)
Los Angeles, California

PURPOSE:

It serves especially the group of students who wish two years of training to gain a better understanding of the world in which they live and to acquire some specific skills that lead to employment in semi-professional activities.

To further meet the needs of different groups of students a number of two-year semi-professional curricula combining in a balanced proportion both skill and vision courses, are offered. The purpose of the vision courses is to give the student an intelligent view of the world in which he lives. The skill courses are designed to furnish the student with tools which will help him secure employment. Graduates from these semi-professional curricula should be oriented in some measure to the intellectual, social, and civic environment in which they will find themselves and they will have a means whereby they may get a start in the economic activities of the community.

The architectural curriculum gives fundamental training in drawing, in the technicalities of materials and construction, and in design. It prepares for work with architects, engineers, builders, landscape architects and with the related industries needing employees with an architectural background.

FIRST YEAR

- English
- Architecture--Backgrounds and Drawing
- Art--Freehand Drawing and Design
- Engineering Calculations and Materials of Construction.
- Physics
- Physical Education

ARCHITECTURE
(Continued)

LOS ANGELES CITY COLLEGE
(Los Angeles Junior College)
Los Angeles, California

SECOND YEAR

Architecture--Drawing and Landscaping

Art--Interiors

Engineering--Problems--Physics--Structural Drawing--

Materials Testing Laboratory--Elements of Plane

Surveying--Estimating

Political Science

Social Science

Physical Education

ARCHITECTURAL TECHNOLOGY

PASADENA JUNIOR COLLEGE
Pasadena, California

Organized on the 6-4-4 plan

Broad and fundamental education in industrial technology is afforded by this department's curricula; ARCHITECTURAL, AVIATION, CIVIL ELECTRICAL, and MECHANICAL. Following the freshman and sophomore years of work, largely general but including some technical courses, the student chooses one of the five offerings mentioned above. These are two-year intensive courses of the "technical-institute" type expressly designed to lead directly to employment in industry, the objectives being preparation for responsible technical supervisory positions.

Graduates should have as objectives positions as foremen or supervisors. The training should ultimately place them in technical jobs as draftsmen, designers, layout men, checkers; or in shop work as mechanics, inspectors, operators; or in production work as store keepers, purchasing agents, production clerks, and material control clerks. It is reported that in industry there are three openings of this kind for every one position for which the longer engineering courses prepare.

ELEVENTH YEAR (High School Junior)

Humanities Survey

Orientation

Production Processes Laboratory

Metal Production Laboratory

Instrumental Drafting

Architectural Drawing

Physical Science Survey

Algebra

Physical Education or R.O.T.C.

ARCHITECTURAL TECHNOLOGY
(Continued)

PASADENA JUNIOR COLLEGE
Pasadena, California

TWELFTH YEAR (High School Senior)

- Social Studies Survey
- Architectural Drawing
- Art
- Physics
- Slide Rule
- Trigonometry
- Solid Geometry
- Physical Education or R.O.T.C.

THIRTEENTH YEAR (Junior College Freshman)

- Residence Design
- Sketching and Rendering
- Technical Reports
- Surveying
- Typewriting
- Electives
- Physical Education or R.O.T.C.

FOURTEENTH YEAR (Junior College Sophomore)

- Residence Design
- Office Practice
- Mechanical Equipment
- Construction Problems
- Color and Design
- Business Law
- Economics
- Electives
- Physical Education or R.O.T.C.

AVIATION

CHAFFEY JUNIOR COLLEGE
Ontario, California

Many students plan definitely to complete their formal education one or two years after high school graduation. For such students the Chaffey Junior College offers many courses.

PURPOSE:

The objective of this department is to give training of trade technical nature and to systematically train men for either mechanical positions in the aeronautical industry, or to give the prospective engineer or designer of aircraft a fundamental knowledge of the science upon which to build his career. The courses offer both practice and theory and will enable the conscientious student to take his place in the industry with a minimum of readjustment. Those who intend to continue toward an engineering degree will find the fundamental theory and shop practice exceedingly valuable.

It is customary for Aeronautics majors to enroll for four hours of work in the Aeronautics Department each day. Usually the first semester's work consists of study of the theory and operation of airplane engines, together with laboratory subjects related thereto. The second, third, and fourth semesters are devoted to technical subjects relating to aircraft construction and operation, with related laboratory problems in actual repair and construction of aircraft.

FIRST YEAR

Airplane Engines
Physics
Mathematics
Theory of Airplane Engines
English
Chemistry or Machine shop
Electives

AVIATION
(Continued)

CHAFFEY JUNIOR COLLEGE
Ontario, California

SECOND YEAR

- Airplane Construction
- Airplane Drafting
- American Institutions
- Physics
- Machine Shop
- Electives

AVIATION ENGINEERING

LOS ANGELES CITY COLLEGE
(Los Angeles Junior College)
Los Angeles, California

PURPOSE:

See Los Angeles City College Architecture sheet.

FIRST YEAR

English

Engineering--Drawing--Machine Drawing--Engineering
Calculations--Aviation--Airplanes--Meterology--
Materials of Construction or Applied Electricity
or Heat Engineering

Physics

Physical Education

SECOND YEAR

Engineering--Descriptive Geometry--Analysis--Physics--
Aerodynamics--Navigation--Airplane Design--
Airplane Engines--Aeronautical Drafting

Social Science

Policial Science

Physical Education

AVIATION, CIVIL, ELECTRICAL
AND MECHANICAL TECHNOLOGY

PASADENA JUNIOR COLLEGE
Pasadena, California

Organized on the 6-4-4 plan

PURPOSE:

See Pasadena Junior College Architectural Technology sheet.

ELEVENTH YEAR (High School Junior)

- Physical Science Survey
- Algebra
- Humanities Survey
- Orientation
- Production Processes Laboratory
- Metal Production Laboratory
- Instrumental Drafting
- Physical Education or R.O.T.C.

TWELFTH YEAR (High School Senior)

- Social Studies Survey
- Production Processes Laboratory
- Metal Production Laboratory
- Production Drafting
- Physics
- Slide Rule
- Trigonometry
- Solid Geometry
- Physical Education or R.O.T.C.

AVIATION TECHNOLOGY

PASADENA JUNIOR COLLEGE
Pasadena, California

Organized on the 6-4-4 plan

PURPOSE:

See Pasadena Junior College Architectural Technology sheet.

For first two years on the 6-4-4 Plan see the Aviation, Civil, Electrical and Mechanical Technology sheet of the Pasadena Junior College.

THIRTEENTH YEAR (Junior College Freshman)

Aeronautical Laboratory
Aeronautical Metallurgy
Aeronautical Machine Shop
Aeronautical Drafting
Aeronautical Wood Shop
Technical Mathematics
Applied Mechanics
Technical Reports
Physical Education or R.O.T.C.

FOURTEENTH YEAR (Junior College Sophomore)

All-Metal Aircraft Construction
Aeronautical Drafting
All-Metal Aircraft Design, Drafting and Construction
Strength of Materials
Aeronautical Mathematics
Industrial Organization
Physical Education or R.O.T.C.

CHEMICAL COURSE

SCRANTON-KEYSTONE JUNIOR COLLEGE
LaPlume, Pennsylvania

PURPOSE:

See Scranton-Keystone Junior College INDUSTRIAL COURSE sheet.

This curriculum is designed to give the student enough of the fundamentals of chemistry and allied subjects to enable him to go into an industrial laboratory and carry out routine analyses. Further, with the knowledge which the student should possess at the completion of the course he should be able to learn new methods and procedures with greater ease than the man who has not had such training. The aim of the course is not to make a finished technician, but rather to provide the student with the background which is so essential to the laboratory assistant.

FIRST YEAR

English
Chemistry
Mathematics
Public Speaking
Engineering Drawing
Integration
Physical Education and Hygiene

SECOND YEAR

Chemistry
Business Organization
Accounting
Economics
Mathematics
Electives
Industrial Chemistry
Physical Education

CIVIL ENGINEERING

LOS ANGELES CITY COLLEGE
(Los Angeles Junior College)
Los Angeles, California

PURPOSE:

See Los Angeles City College Architecture sheet.

FIRST YEAR

English
Engineering--
Drawing
Calculations
Surveying
Land Mapping
Civil Engineering Drawing
Materials of Construction
Physics
Physical Education

SECOND YEAR

Engineering--
Descriptive Geometry
Problems
Physics
Route Surveying
Astronomic Surveying
Elementary Hydraulics
Materials Testing Laboratory
Analysis
City Surveying
Structural Design
Computations
Social Science
Political Science
Physical Education

CIVIL TECHNOLOGY

PASADENA JUNIOR COLLEGE
Pasadena, California

Organized on the 6-4-4 plan

PURPOSE:

See Pasadena Junior College Architectural Technology sheet.

For the first two years on the 6-4-4 Plan see the Aviation, Civil, Electrical and Mechanical Technology sheet of the Pasadena Junior College.

THIRTEENTH YEAR (Junior College Freshman)

Surveying
Map Drafting
Technical Mathematics
Mechanics or Technical Mathematics
Technical Reports
Business Law
Typewriting
Psychology
Physical Education or R.O.T.C.

FOURTEENTH YEAR (Junior College Sophomore)

Surveying
Structural Drafting
Strength of Materials
Technical Mathematics
Industrial Organization
Physical Geology
Physical Education or R.O.T.C.

DRAFTING

SAN JOSE STATE COLLEGE
San Jose, California

PURPOSE:

To prepare draftsmen for positions in architectural offices or with various industrial firms.

FIRST YEAR

Physical Education
Hygiene
Elements of Psychology
English Composition or Speech
Mechanical Drawing
Architectural Drafting
Appreciation
Color Design
Lettering
Electives

SECOND YEAR

Physical Education
American Constitution
Woodwork
Carpentry
Materials of Construction
Machine Shop
Industrial Arts Design
Machine Drawing
Special Problems in Drawing
Electives

ELECTRICAL

JOLIET JUNIOR COLLEGE
Joliet, Illinois

PURPOSE:

The junior engineering courses are designed to terminate at the end of the sophomore year. For this reason, junior engineering courses in the junior college are sometimes called "terminal courses." The curriculum is written in such a way that the training is "rounded out" at the end of the sophomore year. It is not possible to step from a junior engineering course into a four year engineering course at the end of the sophomore year. Any young man enrolling in a two year terminal course in junior engineering should thoroughly understand this situation and thus avoid possible disappointment later.

Recent surveys have shown that industry has almost three times as many jobs for the junior engineer as for the senior engineer. W.E. Wickenden, President of the Case School of Applied Science, from conclusions drawn from a study that lasted over a period of eight years says, "At present this potential demand is not more than one-fiftieth supplied."

FIRST YEAR

Electrical Laboratory
Technical Papers
Modern Industry
Mathematics
Electrical Drafting
Electrical Laboratory, D.C. Machinery
Electricity (D.C. Mach.)
Trigonometry
Mechanics
Gym

ELECTRICAL
(Continued)

JOLIET JUNIOR COLLEGE
Joliet, Illinois

SECOND YEAR

Electrical Laboratory, A.C. Machinery
Electricity, A.C. Machinery
Industrial History
Electrical Mathematics
Electrical Drafting
Electrical Laboratory, Special
Electricity, Special
Manufacturing Practice
Heat Engines
Gym

ELECTRICAL ENGINEERING

LOS ANGELES CITY COLLEGE
(Los Angeles Junior College)
Los Angeles, California

PURPOSE:

See Los Angeles City College Architecture sheet.

FIRST YEAR

- English
- Engineering--
 - Drawing
 - Calculations
 - Elements of Direct Currents
 - Direct Current Machinery and Alternating Current Principles
 - Electrical Drafting
 - Mechanical Laboratory
- Physics
- Psychology
- Physical Education

SECOND YEAR

- Engineering--
 - Problems
 - Alternating Current Machinery
 - Wiring for Light and Power
 - Heat Engines
 - Automatic Control Devices
 - Household Refrigeration
 - Heat Power Laboratory
- Economics
- Business Salesmanship
- Political Science
- Electives
- Physical Education

ELECTRICAL
(Industrial Engineering)

NORTH TEXAS AGRICULTURAL
COLLEGE
Arlington, Texas

PURPOSE:

See North Texas Agricultural College Aeronautical
sheet.

FIRST YEAR

- Electrical Testing
- Electrical Wiring
- Machine Shop
- Mathematics
- Drafting
- Industrial Science
- Business Correspondence
- Electrical Radio
- Direct Current Machinery
- Social Science
- Direct Current
- Military Science

SECOND YEAR

- Electrical Radio
- Alternating Current
- A.C. Machinery
- Machine Shop
- Mathematics
- Drafting
- Social Science
- Prime Movers
- Electrical Testing
- Business Organization
- Military Science

ELECTRICAL TECHNOLOGY

PASADENA JUNIOR COLLEGE
Pasadena, California

Organized on the 6-4-4 plan

PURPOSE:

See Pasadena Junior College Architectural Technology sheet.

For the first two years on the 6-4-4 Plan see the Aviation, Civil, Electrical, and Mechanical Technology sheet of the Pasadena Junior College.

THIRTEENTH YEAR (Junior College Freshman)

Industrial Electricity
Applied Electrical Theory
Electrical Drafting
Technical Mathematics
Applied Mechanics
Metallurgy
Pattern Making
Physical Education or R.O.T.C.

FOURTEENTH YEAR (Junior College Sophomore)

Industrial Electricity
Applied Electrical Theory
Electrical Drafting
Strength of Materials
Technical Mathematics
Industrial Organization
Physical Education or R.O.T.C.

HOTEL AND RESTAURANT
MANAGEMENT

SAN FRANCISCO JUNIOR COLLEGE
San Francisco, California

PURPOSE:

The technical nature of the operation of the several departments of a hotel or restaurant requires, today, professional training for young men and women entering this field. It is the purpose of the Hotel and Restaurant Management Division of the San Francisco Junior College, under the close guidance and supervision of the Educational Advisory Committee, to enable students to raise themselves to a standard of proficiency in every department to which they are particularly adapted. The training program is executed by means of a practical curriculum planned by industry. It is carried on by industrial experts selected from hotel and restaurant organizations who are specialists in hotel and restaurant management education.

FIRST YEAR

- Chemistry
- English
- Restaurant Accounting
- Dining Room and Kitchen Organization and Management lecture
- Dining Room and Kitchen Organization and Management Laboratory
- Foods and Nutrition
- Hotel Mathematics
- Food Chemistry
- Typing
- Food Preparation Laboratory
- Food Preparation Lecture
- Scientific Purchasing
- Front-Office Procedure and Practice
- Hotel English
- Food Cost Accounting
- Hygiene
- Field Survey
- Physical Education

HOTEL AND RESTAURANT
MANAGEMENT
(Continued)

SAN FRANCISCO JUNIOR COLLEGE
San Francisco, California

SECOND YEAR

- Advanced Food Preparation Laboratory
- Hotel Insurance
- Hotel Administration
- Hotel Law
- Advanced Food Preparation Lecture
- Hotel English
- Hotel Advertising and Promotion
- Hotel Housekeeping
- Hotel Drawing
- American Institutions
- Hotel Engineering
- Front-Office Psychology
- Hotel Accounting
- Restaurant Operation Lecture
- Restaurant Operation Laboratory
- Statistics and Graphical Presentation
- Hotel Protection and Public Relations
- Physical Education
- Field Survey

INDUSTRIAL COURSE

SCRANTON-KEYSTONE JUNIOR COLLEGE
LaPlume, Pennsylvania

PURPOSE:

In accordance with the October, 1935, report of the Society for the Promotion of Engineering Education, which recommends the creation of special programs of study terminating at the end of two years, Scranton-Keystone offers two two-year technician's programs.

A great number of functions may be filled by graduates of a two-year course. Among these functions are; routine draftsman; electrical draftsman; structural design draftsman; construction supervisor or foreman; shop foreman; calculator.

The Industrial Course is designed to prepare graduates to fill the foregoing functions. The course is parallel in many respects with the regular engineering program. The particular applications are introduced in the drafting courses, where the varying interests of students preparing for different specializations are stressed in the individual assignments.

FIRST YEAR

- English
- Mathematics
- Physics
- Engineering Drawing
- Economics
- Public Speaking
- Integration
- Physical Education and Hygiene

SECOND YEAR

- Mathematics
- Mechanics
- Machine Design
- Business Organization
- Accounting
- Shorthand
- Typewriting
- Physical Education

INDUSTRIAL ENGINEERING

SAN JOSE STATE COLLEGE
San Jose, California

PURPOSE:

To give semi-professional training in engineering for such positions in industry as drafting and designing, engineer's assistant, assistant to foreman or superintendent, and the management, production and sales of industrial products.

FIRST YEAR

Physical Education
Hygiene
Elements of Psychology
Survey Course in Mathematics
Trigonometry
Surveying
Woodwork
Materials of Construction
Mechanical Drawing
Fuels, Oils, and Greases
Solvents, Paints, Lacquers
Machine Drafting or Architectural Drafting
Electives

SECOND YEAR

Physical Education
American Constitution
Machine Shop
Elements of Electricity
Machine Woodwork
Forging and Welding
Cement and Concrete
Wood Pattern Making and Foundry Practice
English Composition or Speech
Modern Industries

MECHANICAL ENGINEERING

LOS ANGELES CITY COLLEGE
(Los Angeles Junior College)
Los Angeles, California

PURPOSE:

See Los Angeles City College Architecture sheet.

FIRST YEAR

English
Engineering--
Drawing
Calculations
Plane Surveying
Machine Drawing
Problems
Materials of Construction
Manufacturing Processes
Mechanical Laboratory
Physics
Physical Education

SECOND YEAR

Engineering--
Descriptive Geometry
Analysis
Physics
Applied Electricity
Heat Engineering
Elementary Hydraulics
Materials Testing Laboratory
Machine Design
Domestic Refrigeration and Air Conditioning
Heat Power Laboratory
Social Science
Political Science
Physical Education

MECHANICAL TECHNOLOGY

PASADENA JUNIOR COLLEGE
Pasadena, California

Organized on the 6-4-4 plan

PURPOSE:

See Pasadena Junior College Architectural Technology sheet.

For the first two years on the 6-4-4 Plan see the Aviation, Civil, Electrical and Mechanical Technology sheet of the Pasadena Junior College.

THIRTEENTH YEAR (Junior College Freshman)

Machine Drafting
Machine Tool Laboratory
Production Methods
Metallurgy
Technical Mathematics
Applied Mechanics
Technical Reports
Pattern Making
Physical Education or R.O.T.C.

FOURTEENTH YEAR (Junior College Sophomore)

Machine Drafting
Machine Tool Laboratory
Production Methods
Technical Mathematics
Strength of Materials
Industrial Organization
Electives
Physical Education or R.O.T.C.

MECHANICAL
(Industrial Engineering)

NORTH TEXAS AGRICULTURAL
COLLEGE
Arlington, Texas

PURPOSE:

See North Texas Agricultural College Aeronautical sheet.

FIRST YEAR

- Machine Shop
- Pattern Shop and Foundry
- Electrical Shop
- Welding
- Mathematics
- Business Correspondence
- Drafting
- Industrial Science
- Social Science
- Military Science

SECOND YEAR

- Machine Shop
- Pattern Shop and Foundry
- Mathematics
- Social Science
- Drafting
- Prime Movers
- Business Organization
- Military Science

PETROLEUM TECHNOLOGY

TAFT UNION HIGH SCHOOL AND
JUNIOR COLLEGE
Taft, California

FIRST YEAR

Petroleum Chemistry
Oil Fields Mathematics
Petroleum Geology
English Composition
Social Science
Physical Education

SECOND YEAR

Oil Drilling, Production and Natural Gas Plant
Operation (Shop work, 3 hours a day).
Technical Related
Surveying
Hygiene
Social Science
Electives
Physical Education
Science

PHOTOGRAPHY

SAN JOSE STATE COLLEGE
San Jose, California

PURPOSE:

To provide sufficient fundamental training in the science and art of photography so that the student may become a competent assistant in any field of photography, may understand the special applications which are involved in any process, and in the end may come to a real mastery of the subject.

FIRST YEAR

Physical Education
Hygiene
Elements of Psychology
English Composition or Speech
Elementary Chemistry
Elementary Physics
General Photography
Art Appreciation
Perspective
Lettering
Drawing, Scientific
Drawing, Sketching
Plastics
Color Design
Prints and Print Makers
Electives

SECOND YEAR

Physical Education
American Constitution
Advanced Photography
Applied Photography
Photographic Composition
Design and Composition
Art in Modern Merchandise
Accounting
Art
Electives

PHOTOGRAPHY--ART

LOS ANGELES CITY COLLEGE
 (Los Angeles Junice College)
 Los Angeles, California

PURPOSE:

This curriculum is open to any student, regardless of whether he has had previous art training. It trains for advertising, industrial design, fashion illustration, costume design, stage design, interior decorating, and window display. It is helpful in all fields of merchandising such as: Home furnishing, clothing, art objects, and flowers. This course is also a good foundation for advanced art study. It promotes valuable avocational interests and adds to personal culture and appreciation.

FIRST YEAR

English

Art--

Design

Drawing and Painting

Aesthetics

Social Science

Electives from Art, English, Drama, Cultural Arts,
Language, Music or Photography

Physical Education

SECOND YEAR

Art Electives

Psychology

Science

Electives

Philosophy

Political Science

Science

Physical Education

PHOTOGRAPHY

The student who intends to pursue seriously the study of photography should major in Art, offering the following courses as electives:

Chemistry, General
 Photography 53A,
 Selected topics
 Drama, Make-up

Photography, Advanced
 Photography 53B,
 Selected topics

RADIO ENGINEERING

SAN JOSE STATE COLLEGE
San Jose, California

PURPOSE:

To train students for positions as amateur or commercial operators or as sales and service men in radio merchandising firms. Some graduates may enter the allied fields of sound engineering and television.

FIRST YEAR

Physical Education
Hygiene
Elements of Psychology
English Composition or Speech
Elementary Radio
Commercial Radio Application
Radio Code
Elements of Electricity
Survey of Mathematics
Trigonometry
Electives

SECOND YEAR

Physical Education
American Constitution
Advanced Radio
Radio Operators Practice
Typewriting
Salesmanship
Social Science
Psychology in Modern Business
Electives

RADIO AND SOUND ENGINEERING LOS ANGELES CITY COLLEGE
(Los Angeles Junior College)
Los Angeles, California

PURPOSE:

See Los Angeles City College Architecture sheet.

FIRST YEAR

English
Physics--Mechanics--Magnetism, Electricity and
Sound
Engineering--
Drawing
Calculations
Elements of Direct Currents
Problems
Direct Current machinery and Alternating Current
Principles
Psychology
Physical Education

SECOND YEAR

Physics--
Radio Circuit
Sound
Vacuum Tube Circuits
Commercial Application of Radio
Transmitting
Economics
Mathematics
Law
Business Salesmanship
Philosophy
Political Science
Physical Education

BIBLIOGRAPHY

1. Austin, W.H. Can the junior college give necessary work of the engineering course? Journal of engineering education, 26:770-8, June 1936.
2. Barton, John W. Trends in the junior college curriculum. Junior college journal, 5:418, May 1935.
3. Bingham, Walter V. Aptitudes and aptitude testing. New York, Harper and brothers, 1937. 390 p.
4. Case school of applied science, Cleveland, Ohio. Catalog, announcements for the fifty-eighth year 1938-39. [Cleveland, O., 1938] 298 p.
5. Chaffey junior college, Ontario, Calif. General catalog, 1937-38. Ontario, Calif., 1937. 64 p. (Volume 21)
6. Christensen, E.H. Industrial arts in certain junior colleges. Industrial education magazine, 37:11-13, January 1935.
7. Colorado state college, Fort Collins, Colo. Catalog, 1939-40. [Fort Collins, Colo., 1939] 182 p. (Colorado state college bulletin, series 32, no. 1, March 1939)
8. Colvert, C.C. Curriculum trends in junior college. Junior college journal, 9:12-17, October 1938.
9. Davis, Raymond E. Engineering curriculum in the junior college. Journal of engineering education, 26:782-4, June 1936.
10. Dietsch, F.J. Case for semi-professional students. Junior college journal, 9:89-90, November 1938.
11. Dietsch, F.J. Semi-professional credit. Junior college journal, 9:93, November 1938.
12. Duluth, Minn., junior college. Information, announcement of curricula and courses for 1937-38. [Duluth, Minn., 1937]. 42 p.

13. Eells, W.C. Bibliography on junior colleges. Washington, Govt. print. off., 1930. 167 p. (U.S. Office of education. Bulletin, 1930, no. 2.)
14. Eells, W.C. The junior college. Washington, U.S. Govt. print. off., 1935. 11 p. (U.S. Office of education. Good references. No. 31.)
15. Eells, W.C. Vocational or semi-professional? Junior college journal, 9:61-2, November 1938.
16. Garrett, Henry E. Statistics in psychology and education. New York, Longmans, Green and Co., 1926. 317 p.
17. Groneman, C.H. Industrial education in the junior college. Industrial education magazine, 39: 135, May 1937.
18. Harbeson, John W. Can junior colleges meet youth's needs? Junior college magazine, 9:169, January 1939.
19. Hutchinson, Kansas, junior college. Information and announcements for 1939-40. [Hutchinson, Kans., 1939]. 49 p.
20. Joliet, Ill., junior college. Junior electrical engineering course. Joliet, Ill., 1931. 19 p.
21. Kansas state college. Catalog number, seventy-sixth session, 1938-39; announcements for session of 1939-40. Manhattan, Kans., 1939. 294 p. (Kansas state college. Bulletin, v. 23, no. 4, February 15, 1939)
22. Kansas University. Annual catalog ... for 1938-39, and announcements for 1939-40. Lawrence, Kans., 1939. 164 p. (Kansas university. Bulletin, v. 40, no. 1., January 1, 1939)
23. Los Angeles, Calif., junior college. Circular of information and announcement of courses, 1937-38. [Los Angeles, 1937]. 168 p. (Los Angeles, Calif., city school district. School publication no. 299)
24. Mead, J.F. Transfer relations with senior colleges. Junior college journal, 9:235, February 1939.

25. Minnick, J.H. Junior colleges and professional preparation. Junior college journal, 8:444-7, May 1938.
26. Missouri university. Catalog ... 1938-39; announcements 1939-40. Columbia, Mo., 1939. 435 p. (Missouri university. Bulletin, v. 40, no. 5; general series, 1939, no. 5.)
27. Nebraska university, college of engineering. Announcements for the session of 1939-40. Lincoln, Neb., 1939. [67] p. (Nebraska university. Bulletin, series 44, no. 7, March 8, 1939).
28. North Texas agricultural college, Arlington, Texas. Twenty-first annual catalog, announcements for 1937-38. Arlington, Texas, 1937. 170 p. (Bulletin, n. 20, no. 3, June 1937)
29. Pasadena, Calif., junior college. Bulletin 1937-38. [Pasadena, Calif., 1937]. 158 p.
30. Proctor, William M. Vocations and avocations. Nation's schools, 15:17-18, January 1935.
31. Purdue university, Lafayette, Ind. Catalog number for the session of 1936-37; with announcements for the session of 1937-38. Lafayette, Ind., 1937. 475 p. (Bulletin, v. 37, no. 8, April 1937)
32. Rensselaer polytechnic institute, Troy, New York. Catalog, November 1937. Troy, N.Y., 1937. 218 p. (Bulletin, v. 36, no. 1)
33. Sacramento, Calif., junior college. Annual catalog 1939-40. [Sacramento, Calif., 1939]. 114 p.
34. San Francisco, Calif., junior college. Hotel and restaurant management at San Francisco junior college, 1937-38. [San Francisco, 1937]. 15 p. (Hotel and restaurant management, Bulletin no. 2, April 1937)
35. San Jose state college, San Jose, Calif. Announcement of two-year technical courses, 7th ed. San Jose, Calif., 1938. 36 p. (San Jose state college bulletin, v. 17, no. 6, April 1938)

36. Scranton-Keystone junior college, LaPlume, Penna.
Annual catalog, 1937-38. LaPlume, Penna.,
[1937]. 88 p.
37. Smith, Vesta. Status of home economics in public
junior colleges in Kansas. Master's thesis,
1934. Colorado state college. 82 p. ms.
38. Snyder, Louis M. A profile of Los Angeles junior
collegians. Junior college journal, 7:180-4,
January 1937.
39. Taft, Calif., junior college. Circular of informa-
tion and announcements of courses for 1939-40.
[Taft, Calif.] 61 p.
40. Thorpe, T.D. Engineering curriculum in the junior
colleges. Journal of engineering education,
26:779-82, June 1936.
41. U.S. Bureau of foreign and domestic commerce.
Division of economic research. 1938 supplement:
survey of current business. Washington, U.S.
Govt. print. off., 1938. 217 p.
42. U.S. Bureau of labor statistics. Handbook of
labor statistics; 1936 edition. Washington, U.S.
Govt. print. off., 1936. 1151 p. (Bulletin,
no. 616)
43. Walker, K.P. Need for terminal courses. Junior
college journal, 8:179-80, January 1938.
44. Weitzel, H.I. Needs of two types of students.
Junior college journal, 9:22-4, October 1938.
45. Wellemeier, J.F., and Walker, Earl. The public
junior college in Kansas.. n.p., Kansas associ-
ation of public junior colleges, 1937. 98 p.
46. Williams, R.E. Employment study of men alumni of
the Parsons junior college. Master's thesis,
1938. Colorado state college. 121 p. ms.

LIBRARY
COLORADO STATE COLLEGE OF A. & M. A.
FORT COLLINS, COLORADO