

T H E S I S

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VOCATIONAL GUIDANCE  
and  
REVISION OF CURRICULUM

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THIS THESIS HAS BEEN READ  
APPROVED AND RECOMMENDED  
FOR CREDIT




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C O N T E N T S

Part I

VOCATIONAL GUIDANCE

Part II

REVISION OF CURRICULUM

## Part I

### VOCATIONAL GUIDANCE

Many people, including some high school teachers, consider the department of vocational guidance an adjunct to the school; instead of this, it is both foundation and superstructure. The teachers' vision of the field and aim of vocational guidance has been blurred to some extent because the term has been confused with the type of limited education which seemed to be confined mainly to manual arts, because a few misguided enthusiasts claimed that it was possible to determine the exact vocation and then to select for the pupil the few necessary subjects, eliminate all others and thus shorten the time spent in school; because other misguided persons felt that job-getting was the important thing; and because we who profess to see its possibilities have failed to prescribe in an illuminating and convincing way the fact that vocational guidance is an inclusive field which invites and demands cooperation of all.

Vocational guidance has a cultural aspect in that it emphasizes the all around development of all the children of all the people. Likewise its value to society lies in the fact that while it emphasizes the development of the individual, through his work which continually demands the best from the worker, will make his best contributions to society. Again, if the individual selects his life career and makes

adequate preparations for it, he will be happy in this work and thus prevent the large loss resulting from turnover or from the inefficiency of the disgruntled, dissatisfied worker.

It is no longer necessary to argue the importance of vocational guidance with intelligent educators when they understand the real meaning of the term. -- Vocational education should equip the individual to secure a livelihood for himself and those dependent on him, to serve society well through his vocation, to maintain the right relationship toward his fellow-workers and society, and, as far as possible, to find in that vocation his own best development.

This ideal demands that the pupil explore his own capacities and aptitudes and make a survey of the world's work to the end that he may select his vocation wisely. Hence, an effective program of vocational guidance in the secondary schools is essential. Unless plans for such guidance are thoroughly incorporated and continuously exercised, the efforts of the school in behalf of the youth in its charge will be largely misdirected.

From the two preceding paragraphs, it will be observed that vocational guidance is to be definitely planned and this cannot be done by any "hap-hazard" method. Consciously or unconsciously, good or bad guidance has been given by the home, school and environment from time immemorial. In the high school, pupils were guided until recently either into academic courses or out of school; there was no other guidance possible under the course of study that was offered in most of the high schools.

Then one of the first essentials is an active, enthusiastic teacher who can "sell" vocational guidance to the principal if he has not already caught the vision of the possibilities of the work. If the high school principal cannot be completely convinced, there is little chance for systematic guidance.

However, the fact that many high school principals are already guiding pupils and have a broad view of education in its entirety frequently places the high school principal among the leaders in this movement.

The next step is to get the entire teaching force consumed with enthusiasm. This is often a difficult task but success in carrying out the program will be attained just in proportion as this is accomplished. There may be slackers, but the best teacher sees the possibilities of his subject for each pupil's future or else he fails in his task. The teacher should determine his work by a continuous aim. Many teachers teach their subject as best they can because they are found in the course of study and not because they are selected by any conscious purpose.

How different the end will be when each teacher realizes that he may encourage the pupil to discover his powers and possibilities with a view to investing them and also that he may teach the subject not as an end but as a means of self-discovery. Teachers often do more guiding than they know. Statistics from compulsory attendance reports from different



cities tell us that a greater percentage of "drop outs" occurs because children do not like school, or the subject, than for any other one reason even that of financial necessity.

History and civics as social sciences offer many illustrations of the relations of the individual to the various social groups of which he is a member and of the opportunities pupils have to develop habits and traits of good citizenship. A wider knowledge of the workers is necessary in order that many of our community relations may be understood correctly. Many pupils often have their dormant faculties aroused through science and an enthusiastic teacher.

One of the best ways to make enthusiasm contagious is for a group of teachers, who believe in guidance, to interest the pupils singly and in groups. The conservative and possibly the reactionary teacher will fall into line.

Another high school had a Vocational Guidance week. Speakers before the assembly presented the importance of preparation for one's life career and posters in all the corridors showed the value of education in many of the occupations and in the enjoyment of one's leisure and home. And every teacher discussed the value of his own subject with every class during the week.

While every teacher should be a guide to the immature pupils, one person or a committee should be chosen who will systematically direct the guidance work of the particular

school or of all the schools in the system. The director should be a person with a broad and liberal education.

Edward Rynearson of Pittsburg, Pennsylvania, summarizes the essentials of vocational guidance as follows:

- I. The principal and teacher must believe that vocational, moral, and educational guidance is the main purpose of the school. Our boys and girls must be prepared to do the best for themselves, to serve their respective communities, to live amicably with fellow-men, and to get into that life work that will call out their very best powers and abilities.
- II. Directors or counselors must give their best thought and unlimited time to aid the pupils in selecting school subjects, to assist the teachers, to confer with parents and with teachers of elementary school, and to study the occupations and working conditions of the community.
- III . Courses of study so arranged that every member of a democratic society shall get all the education and that sort of education for which as a free spiritual agent in relation of citizen he has the capacity and need.
- IV. The vocational guidance program ought to be so complete that it will be working at every point in the pupil's career rather than at a few specific times.

Vocational guidance has been carried on very well in Oakland and Berkeley. More problems in individual differences than ever before need to be settled due to the changing conceptions for the need of education. These changed conceptions through public opinion have forced hundreds into the high schools. In California, the age limit is 18 years; in Colorado, it is 16; or in both cases, at least an eighth grade education.

The present high school curriculum was made for a select group of students of high mental power. Fifty percent of the children in the United States never reach high school. In the future, our laws will practically see each student in some high school seeking an education which will best fit him for his duties as a citizen. These duties vary much as the occasion of the individual demands.

Junior-high pupils demonstrate their interests in a very pronounced and varied manner. And then is the time, of course, for counseling to be given most. Without counseling at this time and with a great many electives, we find that students select their courses on these arguments: "Don't take that course, it's too hard". "Take this one, it is a snap". "Old Lady Jones is a fright, keep out of her classes". "Mary Brown, my chum, is going to take this course, so I am, too." Of course, the time spent in these courses is then largely lost.

In Oakland and Berkeley, they have "school counselors" and not "vocational counselors", as they feel it is not wise to

place so much responsibility on any one person. Also they doubt if any one person is wise enough to be called a "vocational counselor".

Few students at this age know or even think they know what vocation they expect to follow. If they do, it is based upon unsound encouragement and caution from older friends of ~~boy~~ experience, or from past records of student friends, or perhaps from home and social aspects, or from environment which influences a lot in a temporary way.

Some argue that the duty lies with the teacher, but every teacher knows that he does not have the power to tell the pupil what to fit himself for, but he does have the power to tell him how at least to help determine by suggestion of various trades and industries.

Many high schools have advisory groups, that is, each teacher has a certain number of pupils under her supervision and guidance. Observation shows that students suffer greatly under this plan because of the attitudes of the teacher.

/ Every high school needs a person broad minded, scientifically trained, and widely experienced, and personally adapted to deal frankly and kindly with boys and girls, men and women.

Now by having this person as a "school counselor" does not lessen the duties of each teacher as one might expect, but it really inspires in them a greater interest and greater accuracy in the advisory work of all teachers.

This is not theoretical, but actually what has happened in Oakland in the past five years. At the present time they have a counselor either on full-time or part-time in every junior and senior high school.

The outstanding feature of this system is that while in junior high school each student knows what is offered in the senior high school, and the senior high school student knows what is offered in the colleges and universities. And two and one-half months before a student reaches the senior high school, his schedule has been worked out with his counselor and has been approved and signed by his parents. So there are no snap judgments on enrollment day when he registers in his senior high school.

The counselor is not a dictator. The time for counsel is before an individual gets into trouble and the real counseling program will usually anticipate trouble and prevent it from happening. Time should be equally divided between those hard disciplinary cases and those most capable. The chief duty of the counselor is to deal with the "misfit". A "misfit" is anyone who is not measuring up to his capacity.

Counseling that is worthy of name should be preventive and constructive -- preventive of waste and constructive of power. The plan should have the cooperation of teachers, principals, supervisors, administrative and executive officials and patrons of the school.

In conclusion of this topic, my findings are that the

increasing diversity of abilities and interests among our secondary pupils, coupled with an elective program by the schools, demanding careful counseling and guidance should be led by a person especially trained and qualified for the work, and that such a system of school counseling has been tried out and the verdict is that "it works".

( Not so many years ago students went to high school only to prepare them for college.) But since then courses have been introduced until today we have the modern high school with its many courses.

Counseling is not intended to make children dependent upon outside factors; on the contrary, its result should be to make them self-dependent and independent by placing them in positions where they can work to the best advantage.

We all believe that the same course in any school is not good for all students. We also believe that all students even though they be adapted to the same kind of school work, are not competent to derive benefit from a given course if they are not held up to the same standards of achievement that other students are. In order to make reforms, facts must be known and these must be scientific. These facts are obtained by skillful questioning, by observation of school habits, by intelligence tests, and by conferences with parents and teachers.

Of an entrance class of 623 pupils in a senior high

school important studies were made. Of the 623 students

40 were inferior

155 average

170 above average

125 superior

13 very superior

Of the entire student body

0% were very inferior

5% inferior

16.5% slightly below average

27.9% average

29.4% slightly above average

18.3% superior

2.9% very superior.

These are sufficient illustrations to show the wide variation in the student material assembled in high school. We can thus see the folly of letting these students drift into any old high school course which might appeal to them and assume that they are being prepared for their life work. This is indeed the time when they need expert advice if they ever do.

## Part II

### CURRICULUM MAKING OUTLINE

Every high school which administers Vocational Guidance will soon realize that the curriculum must be revised and the real aims of education must be worked out. This work requires the best efforts of every teacher in the system meeting once a week for a period of a school year. The following is a proposed method of procedure. It is logical in order and it may be expanded to any desired degree. For the best results in curriculum revision, a whole new plan must be worked out anew by each faculty because the success depends directly on the amount of interest developed in the faculty.



# INTRODUCTION OF VOCATIONAL GUIDANCE IN ERIE, COLORADO.

## Introduction

### I. Definitions relative to Vocational Guidance.

A. Introductory sentence

B. Definition of terms

1. Of "education".

a. By Spencer

b. By Dewey

c. By Hanus

d. By Prosser

e. By Bagley

f. By Plato

g. By Thorndyke

h. By James

i. By Cubberly

j. By "1924" Education Class.

2. Of types of education.

a. Vocational education

b. Pre-vocational education.

c. Trade training.

d. General education.

e. Elementary education.

f. Industrial arts.

g. Cultural education.

3. Allen's short definitions of
  - a. Vocational education.
  - b. Pre-vocational education.
  - c. Trade training.
  - d. General education.
  - e. Elementary education.
  - f. Industrial arts.
  - g. Cultural education.

## II. History of Vocational Guidance.

### A. Early history.

1. First record from Plato.
2. In 1670 by Pascal.
3. In 1748 in England.
4. In 1795 by Henry MacKenzie.

### B. Modern history.

1. In 1901-03 Bloomfield organized Breadwinners Institute.
2. In 1908 Federal Vocational Bureau was organized.
3. In 1918 Became major objective in education.
4. In 1922 It had an enviable record.
  - a. Established vocational guidance in Boston, Oakland, Pittsburg.
  - b. Established training courses for teachers.
  - c. Summer school courses in vocational education in
    1. Harvard in 1911.
    2. University of California in 1913.

3. University of Indiana in 1913
  4. Colorado State Teachers College in 1913.
  5. Boston University in 1914.
  6. Columbia University in 1916.
  7. Dozens each year from then on.
- d. Held first National Conference with Boston Chamber of Commerce in 1910.
  - e. Published "The Vocational Guidance of Youth" in 1911.
  - f. Published pamphlets and books on trades, business, and professions.
  - g. Investigation of vocational guidance in Europe and in Porto Rico, and publication of "The School and Start of Life" in 1914.
  - h. Organized the "Boston Employment Managers' Association" in 1911.
  - i. Published "Youth, School, and Vocation" in 1915.
  - j. Published "Business Employments" and "Shoe Industry" in 1916.
  - k. Correspondence, conferences, interviews, lectures, schools, etc. by 1920.

### III. Importance of Vocational Guidance.

- A. Has held prominent place in N. E. A. Conventions.
  1. By Beveridge - Superintendent of Schools, Omaha.
  2. By Emery Filber - University of Chicago.

3. By A. H. Edgerton - Detroit.
4. By Mrs. E. H. McCauley - Beaver, Pennsylvania.
5. By E. E. Lewis - Rockford, Illinois.
6. By H. B. Wilson - Berkeley, California.
7. By H. M. Skidmore - Washington, D. C.
8. By Edwin A. Lee - University of California.
9. By Ruth Mary Weeks - Kansas City, Missouri.
10. By Virgil E. Dickson - Oakland, California.
11. By C. L. Budenback - Berkeley, California.

B. Significance shown by Army Tests.

1. 1,700,000 men in army.
  - a. Classification by mental tests.
  - b. By ability to perform jobs.
2. Immigration characteristics revealed.

C. Significance shown by State tests.

1. Results of tests in Colorado and California 1916-19.
  - a. I. Q.
  - b. Number of cases
  - c. Per cent drop out.

D. Significance shown by Local tests in Longmont, Colorado.

1. Class given Vocational Guidance and results.
2. Results from inquiry cards.
  - a. Industrial
  - b. Professional
  - c. Commercial
  - d. Agricultural

**E. Significance shown by questionnaire sent to**

1. Successful merchants.
2. Successful bankers.
3. Successful miners.
4. Successful farmers.
5. Successful stockmen.
6. Successful professional men.

**IV. Plan for Vocational Guidance.**

**A. Analysis of the situation.**

1. Vocation guidance success.
2. Counselor.
3. Guidance must be stimulated by
  - a. Self-analysis.
  - b. Personal data.
  - c. Counselor's advice.
  - d. Occupational information.
4. Interest of teacher.
5. Ability of teacher.

**B. Aim**

1. To stimulate self-analysis on part of pupil.
2. To increase pupils' vocational information.
3. To study child's personality.
4. To instill industrial or vocational interests.
5. To introduce pre-vocational thought.
6. To guide intelligently to electives in curriculum.
7. To stimulate child into intellectual activities.
8. To develop power of personal efficiency.

C. Method.

1. Analysis by questionnaire.
2. Study of vocational trades.
3. Analysis of inquiry cards.
4. Leading child to vocational decisions.
5. Mental and educational measurements.
  - a. By a selected method of mental tests.
  - b. By a suitable method of manual dexterity.

D. Machinery.

1. The special work of preparing the child's mind for successful educational guidance must be done by

a. Regular teachers

1. English teachers thru English composition, oral discussion or debate.
2. History teachers by short talks or lessons showing how earlier generations chose occupations and developed individual talents.
3. Mathematics teachers by pointing out the significance of different phases of mathematics in various callings.

b. Special teachers

1. Industrial arts, agriculture, and commercial teachers by making their work pre-vocational and showing its relation to out of school occupations.

- c. Principals, by talks to groups or the entire school on occupational subjects.
  - d. Vocational teachers, by talks to students on their line of work.
  - e. Successful persons from the outside of school giving talks on their respective occupations.
2. By having each child under a counselor during his seventh and eighth year and passing the records on up through high school.
  3. Guidance of the child in choosing his elective studies for the following semester should be based upon
    - a. His personality and school record.
    - b. Data given on his questionnaire and report cards.
    - c. The idea and wishes of the child and his parents.
    - d. Careful consideration of other conditioning factors that will occur to the teacher.
  4. The selection of every elective study must have behind it a good and sufficient reason and not based upon reputed ease of work, or similar notions in the mind of the child.
  5. The principal will assist in different cases by advice to the teacher through conferences with the children.

**E. General Considerations.**

1. Educational guidance will supplement the home in giving much needed wise counsel and advice to the child at a critical time in his life, the beginning

of the adolescent period. This may be accomplished by

- a. A regular teacher in daily contact with students.
  - b. A professional director in personal talks and interviews.
  - c. Interview by appointment with some professional or business man who is known to all.
2. Educational guidance is a continual process and requires a combination of private work and class work together with counseling and follow-up work.
  3. Many children develop a disloyal attitude toward school and an antagonism toward authority which can be entirely changed by getting him into the right course of study, and giving him a definite aim in life.
  4. Educational guidance offers a rich field for teaching the individual child his relation and duties to society and the state by giving him lofty ideals, better standards of living, and making him a happier citizen.



- A. Vocational Guidance is needed in Erie schools.
  - I. Sixty percent of students are from working industrial families.
  - II. Thirty-five percent are from the farming district.
  - III. Remaining five percent are scattered.
  
- B. Vocational Guidance can be given in Erie schools.
  - I. By the system adopting a set of controlling aims.
  - II. By committees adopting a set of departmental aims.
  - III. By teachers adopting certain grade aims.

### Conclusion

It is the function of the Erie school system to educate every boy and girl, to eliminate none, to accept all. It fits work and methods to individual needs, and strives to send children out of school just as individually diverse as Nature designed them to be, and as the diversity of service which awaits them requires.

AIM OF EDUCATION  
"SOCIAL EFFICIENCY"

Necessary Outcomes:

- a. Knowledge
- b. Habits and skills
- c. Attitude.

PHASES OF EFFICIENCY

1. Vital or Physical Efficiency:

Health: The building up of strong and healthy bodies in our children must be a first consideration of the schools. This should be fundamental to all the other work in education, for without health one is seriously handicapped in his pursuit of the other aims that we set for him.

2. Vocational Efficiency:

Economic independence: Education, in addition to suitable training for all degrees of mental ability, should also do the utmost to make people self-supporting. It should aim to lead children to become effective workers in some direction that is worth while to society.

3. Avocational Efficiency:

a. Culture: Education should furnish the suggestions and influence necessary to make the child receptive to culture.

b. Use of leisure: So much does one's happiness depend upon his use of the leisure hours that we must give in school some training in this direction. A desire for recreation that is worthy should be established and cultivated.

c. Home membership: Especially in this day should we have as an important aim of education the inculcation of right ideas of home membership. The privileges and duties which children have in the homes of their parents and those which they will have later in homes of their own should be impressed upon them.

#### 4. Civic Efficiency:

Citizenship: Each child should be made to feel his relation to the rest of society. He should be given some sound basis for understanding other "walks of life" than that in which his present lies or his future seems to lie. Thus will he get, if he can get it from school, the broad outlook which is necessary for intelligent citizenship. He should know how other people live, what they think and why they think it. He should be trained to the judicial attitude which will lead him to see both sides of a question and to judge on the merits which he discovers in them. He needs to see the degree to which his own conduct affects society and to feel the responsibility which this places upon him. He needs also to be given an invincible enthusiasm for doing that which will be of most service to society, his own community, perhaps, at first, then his country, and later the whole world.

#### 5. Moral and Religious Efficiency:

Character building: Good habits, high moral principles, and what are called "Christian virtues" - unselfishness, kindness, charity and the like - should be objectives that are kept constantly in mind from the beginning to the end of the education period of the child.

## A REVISION OF HIGH SCHOOL MATHEMATICS

There is only one objective in this field of endeavor -- to make high school mathematics more practical. Recently a questionnaire was circulated among all of the business men of our town and surrounding community, with a list of items taught in high school mathematics on it. We asked each person who received a questionnaire to indicate which of the items taught were of value to him, and furthermore asked him to suggest items which would be of value. The result was amazing, but the truth was evident. We must revise our course of study. After two years of investigation we adopted this plan.

For years we have been teaching all of our high school students that mathematics which only one in one hundred would use. We have been cramming into the students cube root, quadratics, equations of high degrees, when the most difficult mathematic operation which they had to do in their successful after life was to measure a yard of cloth, or a cup of flour, or a load of lumber, or a piece of pipe. Little wonder that these same people, the tax-payers, are a little reluctant about bonds for a new half million dollar high school with a salary schedule for the faculty from \$1500 to \$3000. For these reasons we have felt the need of becoming a unit in this progressive movement.

Nor have we forgotten the student who wishes mathematics for college preparatory work, for I have consulted professors

from the four colleges and universities in our state. The plans of Berkeley, Pittsburg, Chicago, etc. have been studied and criticised. This is not the passing whim of mathematics teachers, but it is the growing demand of our whole nation.

My plan of procedure is simple:

First: The general aims of education.

Second: The aims of mathematics and the content of the textbook.

Third: The correlation of the mathematics content to the general aims.

Fourth: The method of applying the mathematics course to useful operation.

Now that it is evident what we are attempting to do, and the reasons for our attempting this task is of no little consequence, we will proceed with the methods of how we propose to do it. It is to be noted that the aims which we have drawn up in mathematics correlate with our general aims on page 21.

AIMS IN MATHEMATICS  
SOCIAL EFFICIENCY

Necessary Outcomes:

- a. Knowledge.
- b. Habits and Skill.
- c. Attitudes.

PHASES OF EFFICIENCY

I. Vital or Physical Efficiency:

- a. To teach by the graphing of statistics concerning health records, physical developments, and athletic achievements, the developments due to proper food correct physical training.
- b. By graphing comparative heights and weights thus giving a clearer insight into the physical fitness of the individual.

II. Vocational Efficiency:

- a. Commercial:
  - 1. To Promote business ability by:
    - a. Familiarity with business terms
    - b. Familiarity with business methods
    - c. Understanding of business principles.
  - 2. To promote thrift by:
    - a. The use of problems that stress thrift.
    - b. Showing how a small unit acting through an ordinary duration of time becomes a large

amount either as income or expenditure.

c. Teaching economy by conservation.

1. Time

2. Materials

3. By-products.

d. Teaching the value of money (foreign exchange)

e. Teaching maxima and minima.

b. Home Economics:

1. To develop accurate knowledge of proportionate parts.

2. To develop thrift by household economics.

a. By use of budgets.

b. By household accounts.

c. By quantitative buying and time of purchase.

c. Agriculture:

1. By farm management and accounting.

2. Practical farm problems.

3. Ratio and proportion.

d. Industrial.

1. To give the power to understand and express the true worth of things, men, and institutions.

2. To show the relationship between output and wages.

3. To so educate the child that he will choose to build better houses instead of poorer ones for his own good; or to increase a poorly paid laborer rather than to build up his own art gallery.

e. Professional:

1. To promote accuracy with as much rapidity as possible in dealing with quantitative values, (if not accurate).
2. To establish a foundation for his professional career.
3. To acquire knowledge of the functional relationship of quantitative values.
4. To have a working knowledge of the different methods of representing values and development of special imagination.

III. Avocational Efficiency:

a. Cultural:

1. Appreciation of the beauty of geometric forms, of nature, art, and industry.
2. To satisfy the child's felt need for a knowledge of laws of numbers.
3. Teach symmetry of forms.

b. Use of leisure time:

1. Mathematical recreations.
2. Mathematical clubs.
3. By making those things of use in or around the home, such as small furniture, laying out gardens, etc.

c. Home membership:

1. To teach appreciation of equal division in the home
  - a. of income
  - b. of time



c. of work

d. of luxuries.

2. To teach the individuals remunerative contributions to the home if necessary.

#### IV. Civic Efficiency:

- a. To teach responsibility by taxes, tariff, assessments, insurance, etc.
- b. To teach the value of the individual's service to the community work.
- c. To give an understanding of types of bonds.
- d. To teach an understanding of civic affairs or questions by means of graphs.
- e. To teach a conservation of civic resources (not applicable in Longmont).
- f. To give the power to evaluate customs and precedents.

#### V. Moral and Religious Efficiency:

- a. To cultivate a reverence for truth.
- b. To cultivate honesty.
- c. To cultivate the good habit of neatness, perserverance and of self-reliance.
- d. Character building.
  1. To judge well.
  2. To reason well.
  3. To comprehend well.
  4. To express well.
  5. To execute well.

- e. To convey to the child the knowledge of the fact that all the fundamental laws of the universe are formed and executed by a Supreme Power.

- - - - -

## FIRST YEAR OF HIGH SCHOOL MATHEMATICS

I. To plan the courses in each year in such a way as to give the pupil the most valuable mathematical information and training which he is capable of receiving in that year with little reference to the courses which he may or many not take in succeeding years.

The content of the textbook should be so selected as to include those mathematical notions and processes which have the greatest social value and which emphasize thinking rather than mere manipulation.

II. To limit drill in algebraic manipulation to those processes and to the degree of complexity required for a thorough understanding of principles and probable applications either in common life or subsequent mathematics

And so acting on this criteria (that is social worth and thinking value) about one-third in the first year algebra should be eliminated as drill as an end in itself can have no justification.

III. To promote the one idea which is sufficient in its scope to unify the course is that of functional relation. The concept of a variable and of the dependence of one variable upon another is of fundamental importance.

The textbook should emphasize a systematic organization of three methods of representing and determining functionality; that is, the graphic method, the tabular method, and the equational method.

IV. The primary and underlying principle of the course in algebra and trigonometry should be the notion of relationship between variables, including the methods of expressing and determining such relationship. The notion of relationship is fundamental both in algebra and in geometry. (The teacher should have it constantly in mind).

The textbook should contain that material which shall give the student the ability to recognize relationships between magnitudes, to represent such relationships economically, and to determine such relationships.

V. To enable the student to gain a clear working knowledge of the idea of ratio and its uses, and what is meant by saying "A variable is proportional to another variable." The subject of variation may receive considerable emphasis in view of the usefulness of the ideas and training involved, and the wealth of significant and easy problem material.

The textbook should bring in very early in the course ratio and the laws of variation, as its use is more important than square root, radicals and the quadratic equation.

VI. To consider only the important cases in factoring; that is, (1) monomial factors, (2) the difference to two squares, (3) the square of a binomial, (4) and trinomials of the second degree that can be easily factored by trial.

The textbook should contain only these problems and examples of the new method of factoring. The order should be scientific and psychological.

VII. To confine the consideration of radicals to the simplification of expressions of the form  $\sqrt{a^2 \pm b}$  and  $\sqrt{\frac{a}{b}}$  and the numerical evaluation of simple expressions involving the radical sign. Extraction of the square root of numbers should be included but extraction of the square root of polynomials should be omitted with the exception of the square of trinomial squares.

The textbook should omit the over complicated and useless material, as the extraction of the square root of a polynomial, excepting the square roots of trinomial squares because they are needed in simple quadratic equations.

VIII. To give an insight on trigonometry by (1) the definition of sine, cosine, and tangent, (2) their elementary properties as functions, (3) their use in solving problems

involving right triangles.

The textbook may present trigonometric ratios as a way to use the right triangle for indirect measurements.

**IX.** To omit the following the first two years:

1. The highest common factor and the lowest common multiple, except the simplest cases involved in addition of simple fractions.
2. The theorems on proportion relating to alternation, inversion, composition and division.
3. Literal equations except such as appear in common formulas such as may be necessary in the derivation of the formulas.
4. All radicals except as recommended above.
5. Extraction of square root of polynomials.
6. Cube root.
7. Theory of exponents.
8. Simultaneous equations in more than two unknowns.
9. Pairs of simultaneous quadratic equations.
10. The theory of quadratic equations.
11. The binomial theorem.
12. Arithmetic and geometric progressions.
13. The theory of complex and imaginary numbers.
14. Radical equations except such as arise in dealing with elementary formulas.
15. All equations of degrees higher than the second.

Textbook should omit all of the above.

X. A laboratory course should be introduced to take the place of the work omitted in Section IX. One period a week should be given over to laboratory work. The following are suggested experiments:

1. The relation of the diameter to the circumference.
2. Demonstration of the Pythagorean Theorem.
3. Demonstration of leverage problems.
4. The relation of the diagonal of a square to its side.
5. The relation of the hypotenuse to the shorter side of a  $30^\circ$  triangle.
6. To find the area of irregular planes.
7. To find the volume of irregular solids.
8. To find the area of a very irregular area.
9. To find the volume of a very irregular solid.
10. To make a series of estimations.
11. Densities.
12. Use of Logarithms.
13. Use of Tables.
14. Use of Slide Rule.
15. Short cuts in mathematics.
16. Comparison of volumes.

In like manner a proposed course of study in Civics and History was prepared.

GENERAL AIMS IN HISTORY AND CIVICS  
"SOCIAL EFFICIENCY"

Necessary Outcomes:

- a. Knowledge,
- b. Habits and skill.
- c. Attitudes.

PHASES OF EFFICIENCY

I. To produce vital and physical efficiency by:

Depicting man's conquest of physical and natural obstacles.

Imparting a knowledge of the evolution of physical education, games, and sports.

Tracing the development of our knowledge of medical sciences, sanitation, and control of disease.

Showing the necessity of biological fitness and vigor for the success of men and of nations.

Arousing a sense of social responsibility in connection with the control of disease and the maintenance of public health.

II. To produce vocational efficiency by:

A study of the various vocations in their historical perspective - their development, possibilities, and opportunities.

Guiding the pupil to a choice of a suitable vocation and acquainting him with its evolution, resources,

raw materials, tools, and processes.

Teaching the relation of each vocation to the whole economic system, and the inter-dependence of different economic groups.

Arousing the pupil to an appreciation of the nobility of labor, and a sense of pride and contentment in his work.

III. To produce avocational efficiency by:

Arousing interest in the pursuit of information for its own sake.

Imparting to the pupil a store of valuable historical material which may furnish a background for many useful activities.

Vitalizing and giving perspective to other subjects.

Arousing an interest in the story of the human race and its innumerable interests and activities, its arts, literature, science, and all cultural achievements.

Laying the foundation for true culture and refinement.

Contrasting the things which are ephemeral with those things which have endured and are, therefore, of permanent value.

Enlarging the mental horizon of the pupil and thus bringing him into touch with the worthwhile activities of society and stimulating him to participate in them.



IV. To produce civic efficiency by:

Imparting a knowledge of the origin, development, and essential nature of social institutions.

Developing the power to collect, arrange, and analyze facts, and to utilize them in the solution of social problems.

Developing the intelligence and ability to participate effectively in worthwhile social activities.

Arousing a sense of responsibility in the individual as a member of the social group.

Broadening the outlook; developing an attitude of sympathy and tolerance toward other individuals, classes, nationalities, and races.

Arousing a spirit of sane and healthful nationalism.

Showing the evolution of national ideals and their significance in the life of a nation.

Stimulating the large group consciousness and a sense of world citizenship.

Arousing respect for democracy as a form of government, and loyalty to its institutions and ideals.

V. To produce moral and religious efficiency by:

Tracing the development of man's moral nature and his religious convictions.

Inculcating ethical ideals through a study of historical characters, their motives, conduct, and actions.

Training the judgment, imagination reasoning power, and memory.

Imparting a larger view of life, and the power to see all things in their essential relations -- historical-mindedness.

Developing the spirit of tolerance.

Arousing a love of truth, for its own sake.

Arousing respect and reverence for things of lasting value,

Imparting the conception of human development as a progress toward higher ideals, a progress which may be taken in hand and consciously assisted.

In like manner each subject should be taken up and a revision of the material should be made.

Because this is such a new field of endeavor and because the material concerning it is so limited it is well at this time to introduce some subjects which might be well discussed at faculty meetings.

#### Faculty Meeting Subjects.

- I. Vocational Guidance as a Function of the Junior High School, presented by the Principal.
- II. Organization and Differentiation of Courses.
- III. School Socialization.
- IV. The Administration of Vocational Guidance in Other Junior High Schools.
- V. Home Visiting as a Function of the Vocational Counselor.
- VI. Psychological Tests and Vocational Guidance.
- &  
VII.
- VIII. Literature for Teachers on Vocational Guidance.

- IX. Sources of Vocational Information for Students.
- X. Vocational Guidance Through the Continuation School and Employment Supervision.
- XI. The Teacher as a Counselor.
- XII. Contributions of Vocational Guidance to Student Training.

In conclusion, the following facts are much in evidence.

First, the revision of the curriculum requires the work of experts who are broad-minded enough to deviate far from the beaten course when necessary.

Second, The education we now give is not far different from that brought over in the Mayflower.

Third, vocational guidance is now being given and the curricula is in a state of revision in many progressive schools.

The aims and revisions in Part II of this Thesis are the results of two-years study and research. The auther has noted a marked improvement in the interest and efficiency of sixty-four teachers in a school system in a town of 8,000 population, and the school system that is not working on this problem belongs in the Dark Ages.

## B I B L I O G R A P H Y

### Books

- Cubberley - Public School Administration.  
Dewey - Schools of Tomorrow.  
Hill - Introduction to Vocational Education.  
Dewey - Democracy and Education.  
Bobbitt - The Curriculum.  
Allen - The Instructor, The Man, and The Job.  
Snedden - Vocational Education.  
Payne - Administration of Vocational Education.  
Weeks - Vocational Education.

### Periodicals

- N. E. A. Journal - 1921-1922-1923.  
Schools and Society - 1922-1923  
School Life - 1923-1924.  
Educational Review - 1924.

(See C. A. C. Readers' Guide for dates and pages)

### Bulletins

- Pittsburg City Schools.  
Oakland Curriculum.  
U. S. Bureau of Industrial Education.