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The effect of the incidental teaching of spelling in two tenth-grade social studies classes

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THE EFFECT OF THE INCIDENTAL TEACHING OF SPELLING IN TWO TENTH-GRADE SOCIAL STUDIES CLASSES

Submitted by
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(B.S. in Education, Connecticut State College, 1932)

In partial fulfillment of requirements for the degree of Master of Education

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Additional comments or notes to
Supply of wanted materials

...
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CHAPTER I

THE PROBLEM AND JUSTIFICATION

Purpose of This Study

This experiment is an attempt to measure the effect, if any, on spelling achievement and Social Studies attainment, of one type of incidental teaching of spelling.

Importance of This Problem

The effect of the incidental teaching of spelling in a Social Studies class points to a problem with which all public school classroom teachers are confronted. All teachers are charged with the educational aim of teaching and supervising the training of the whole individual. Much of this instruction comes through indirect, or incidental teaching.

The Cyclopedia of Education refers to the Incidental Method of Teaching as,

"Any plan calling for the teaching of a series of facts, forms, or skills incident to the systematic study of some other subject utilizes the 'incidental' method of teaching. Arithmetic, spelling, and grammar are taught incidentally...it is urged that spelling should be discontinued as a subject with the close of the sixth year of school and taught incidentally thereafter."

1/ Monroe, Paul, Editor, Cyclopedia of Education, 3, Macmillan Company, New York, 1932, p. 397
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Organized in

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During the course of meetings with
the imperial delegations, visits to the American, British, and
African national delegations. The visit

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References to Bulletins

To ensure that the mandate and the violation with the
the conditions set by the mandate. Within the context of
the conference's discussions, significant steps were taken to
fulfill the objectives. These steps were consistent with the
obviously effective and seem to have been by many states and
<br>
References: American, British, and African national delegations.
Wesley makes recommendations which are more extensive. In his chapter, "Objectives in the Social Studies", he states,

"A valid educational objective is one that is susceptible to achievement through school instruction. This requirement doesn't imply that the objective must be susceptible of direct achievement, immediate or deferred, for achievement may come indirectly as a result of changed attitudes and habits... Presumably all subjects will contribute to the objectives for their levels and to the general education objectives."

That this is not easily done has been recognized by others. Peters writing on "Objectives and Procedures in Civic Education" devotes two chapters to this subject for a total of sixty-eight pages. He "blue prints" two hundred and thirty-four objectives of good citizenship and admonishes the reader that there have been omissions, and that he is referring to a "citizenship in the restricted sense".

Snedden clearly points to this problem in an article on "The Effect Upon Methods of a Changing Curriculum: With Special Reference to the Social Studies",

"What we are now calling the 'social studies' gives more than usual trouble to teachers at present because in certain respects the objectives or the valued purposes of these studies become highly ambitious and therefore more confused within recent years."

1/ Wesley, Edgar Bruce, Teaching the Social Studies, D.C. Heath and Company, Boston, 1942, 2nd Edition, pp. 78-83


The Social Studies teacher, then, faced with numerous educational and social aims, has a problem. Stated in specific terms, along with attempted achievement of manifold understanding and civic aims, the teacher has further responsibility to instruct for such educational aims as word understanding, legible handwriting, correct sentence structure, accepted punctuation, reading comprehension, clarity of speech, and correct spelling. In addition, there are niceties of classroom associations, attitudes towards study, work habits, and study skills to be acquired as the student's needs unfold.

Faced with such a conglomeration of objectives, the needed achievement of which is most evident, the teacher's problem is further limited by the "time honored" school day made up of the conventional forty-five to sixty-minute class periods.

In regard to this, Rugg's views are of interest.

"No adequate course in the Social Studies can be developed successfully in the time allotted to it in most public and private schools. Our elaborate program of research and our seven years of work with experimental editions of the Social Service Pamphlets proves conclusively that more than sixty minutes of daily class time must be devoted to the social studies in order that young people may obtain even a partial understanding of modern civilization."

The solution is clearly indicated. Much of the learning must of necessity be acquired by incidental, or indirect, or

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oblique teaching. Call it whichever is wished, but through various motivations, brief suggestions, quiet admonitions, the teacher directs pupil activity towards a solution.

The question therefore arises, -- is teaching incidental to the primary subject matter objectives effective? That it is not the best way of inducing learning is known, but by necessity it is required. It is not the purpose of this study to seek optimum conditions of learning, nor is an attempt made to prove the best type of indirect teaching.

**Incidental Teaching Defined**

Incidental teaching, as indicated above, may be called indirect, oblique instruction which attempts to influence behavior parallel to the main objectives of the subject course of study. Spelling was selected as the item of learning as it is susceptible to incidental teaching and the level of achievement may be objectively measured.

**Summary**

The Social Studies teacher is faced with the problem of accomplishing a manifold number of aims. To attain achievement of these objectives, the teacher frequently uses incidental teaching. The purpose of this study is to gauge the effect of this teaching, both on achievement in spelling and Social Studies.
This study proposes specifically:

1. to measure the effect of the incidental teaching of spelling on spelling achievement.

2. to measure the effect of the incidental teaching of Spelling on Social Studies achievement.
CHAPTER II
CHAPTER II
FINDINGS AND CONSIDERATIONS OF OTHERS

Incidental Teaching

The technique of teaching incidentally is recognized to be of some value, and this fact is not seriously disputed in educational literature. There seems to be no subject or curriculum organization to which it does not lend itself. However, the extent of the indirectness of the incidental teaching described or advocated raises a question.

Related Studies

Horn, after surveying the scientific research on methods of teaching spelling, cautions, "Do not depend solely upon the incidental teaching of spelling."

This admonition takes into consideration a controversy existant since the latter part of the nineteenth century among educators in regard to the systematic teaching of school subjects as against incidental methods. Direct teaching, many times enlisting monotonous and time-consuming drills, has been attacked as being of slight value and productive of little better achievement than could be

attained by incidental methods. Incidental teaching techniques have been belittled as haphazard and not so efficient as direct instruction.

This controversy points clearly to the problem of this study. On one side exists the manifold aims with the limited time factor. Opposite, lies the question of teaching method for more efficient results. The modern curriculum organization attempts a solution.

Fellows studied the influence of theme correction (incidental teaching) on the elimination of technical errors in the written composition of ninth-grade pupils. For a period of twelve weeks, he enlisted the aid of twelve teachers teaching two sections of ninth grade English students.

During the first four days of each week, the pupils of both sections were given a series of formal dictation and multiple response drills based upon thirty of the more definite and less debatable skills of written usage. The last day of each week was spent in the writing of compositions. Each teacher corrected the themes of one group of pupils by means of an error guide and code, checking all errors of the kinds embodied in the formal drills and assigning a letter

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1 Fellows, John E., The Influence of Theme-Reading and Theme Correction on Eliminating Technical Error in the Written Compositions of Ninth Grade Pupils, 7, (March 1, 1932) No. 1, University of Iowa Doctoral Thesis in Education, Iowa City, p. 9-44
grade or mark. The themes were then returned to the pupils to be rewritten and returned in corrected form. This technique was called the "theme-correction" method.

The compositions of the second group were also read, but no errors were checked or indicated in any manner, although a letter grade or mark was given to each theme. These themes were also returned to the pupils, but no rewriting and returning of corrected themes were required. This technique was termed the "non-theme-correction" method.

On the basis of his measurement, the author believed the following conclusions were warranted, in spite of the limitations of his study:

Theme-correction (incidental teaching) is slightly more effective than non-theme-correction in eliminating technical errors. It is more effective in eliminating errors in punctuation and grammar than in correcting those of spelling and capitalization. Theme-correction operated more effectively in securing improvement in English mechanics among the "bright" and very slightly among the "dull" pupils.

Value of Incidental Teaching

The importance of Fellows' study becomes clearer when the following advice by Bining is considered.

"Since the main objective of American education is to attain competent and worthy citizenship it is evident that some attention should be paid to English teaching in the social studies and that pure language should be insisted on, as far as possible... The teacher must emphasize the need of speaking good English at all times... in all replies to questions, in floor talks, oral reports, debates and explanation of black board work, only the best forms of language expression are to be used... Themes, papers and notebooks must be corrected and returned with the admonition that the pupil must not permit the same errors in English to occur again."

The above consideration is related to this study in that incidental teaching is clearly advocated for the Social Studies teacher. However, the results prove to be of doubtful value even where relatively simple learning is concerned.

To continue with another authority on the necessity and value of incidental teaching, Poley, writing in the English Journal, December 1945, states:

"There are so many phases of English which high-school students need to know that it is impossible to teach all of them directly. Hence the need for oblique teaching to supplement direct teaching."

"Much punctuation, much spelling, nearly all grammar in the senior high school, syllabification, pronunciation and the two or three most important diacritical marks, nearly all literary history and backgrounds of author's lives, figures of speech, nearly all vocabulary, alliteration and rhyme and the difference between them---these are some of the phases of English best taught obliquely...

"Of course oblique teaching is not new; many of us English teachers have used it, sometimes unconsciously, sometimes even a little apologetically because we have thought every lesson should be an obvious whole..."

That present-day teachers of English regard incidental

1/ Poley, Irvin C., "Teaching Obliquely and Testing Directly", The English Journal, (December 1945), 34, No.10, pp. 10-12
teaching as indispensible serves to accentuate the problem under present consideration. However, there are some other considerations.

**Weakness of Incidental Teaching**

Peters\(^1\) staunchly recommends incidental teaching in Civics, but he is most careful to point to its weakness. In writing on "Pitfalls Regarding Incidental Teaching", he states:

"There is danger that this incidental teaching may become too stilted and too obviously moralistic. If it does, it will lose much of its effectiveness. It must be so managed as to seem casual and natural. There is, however, the still greater danger that it will be neglected—that the teacher will claim possibilities for his subject yet go through the year without having actually done much with them—for to use history as a vehicle for any kind of practical ethical teaching does violence to the academic conscience of many subject-matter scholars. The teacher must repeatedly lecture himself about his temptation to teach his subject rather than to train his pupils for citizenship through his subject as a tool, and must particularly charge himself with his duty to utilize opportunities for incidental teaching. Indeed he should go through his text book or his course of study at the beginning of the year and note in the margins materials he could bring in, or problems he could raise, that would relate to particular civic ends, then faithfully take cognizance of these notations in making his daily lesson plans."

Professor Barr\(^2\) has some serious doubts about the prudence

\(^1\) Peters, *op. cit.*, p. 50

of using incidental teaching of vocabulary, particularly in the social studies. This is based on a study of the relation between achievement in history as measured by the Barr Diagnostic Test in American History and a preliminary issue of a word meaning test in four forms. Coefficients of correlation ranging from .591 to .639 indicated a strong dependence on word meaning for history achievement.

Believing that the acquisition of meanings is now brought about largely through the instrumentality of incidental learning, Barr raises the question as to whether or not this natural process of acquiring meanings may be hastened through specially designed modes of instruction.

In reply to this criticism of incidental teaching of vocabulary, Newburn showed that children studying history attach vague meanings to apparently simple phrases in history content which definitely limits their accomplishment in the subject. He found that relatively brief periods


of training (incidental teaching) in the acquisition of clearcut meanings for these terms results in greatly improved accomplishment. This authority states:

"Possibly the most successful method of teaching vocabulary will be the presentation of the meaning at the exact time it is needed in a specific situation and by individualizing the drill procedure. How to do this and at the same time provide for the positive improvement of achievement of history can be determined only by future experimentation."

Incidental Teaching Defined

The question arises at this point whether "relatively brief periods of training in the acquisition of meanings" is incidental teaching of vocabulary. According to the Dictionary of Education, "Teaching incidental is the teaching of certain skills or terms only as the need for them occurs in connection with other school work or with the pupil's activities or interests."

From the Semantics point of view, it would appear that the label "incidental teaching" as defined above, would correspond to the name for the training Newburn used to gain achievement in history and for the theme-correction technique of Fellows.

Incidental Teaching in New Type Curricula

Teachers have not been alone in considering incidental
teaching as a useful technique. The curriculum framers have also taken cognizance of this method of teaching. Hopkins, writing on the subject, "Integration, Its Meaning and Application", states,

"The correlated curriculum is in wide use all over America. In many instances, it is called by some other name, so that a classification cannot be made without examining the basic viewpoint and the actual practice. The correlated curriculum seems to be carried on in numerous ways which can be conveniently arranged on a scale. At the bottom would be located casual and incidental efforts to make relationships between or among subjects. At the top of the scale would be located those conscious and definitely planned efforts to see that relationships among subjects were made and carried out effectively. It is sometimes argued that all good teachers under the subject curriculum have always carried on individually a form of correlation with other subjects quite unknown to the teacher of the other subject. Though this is admitted, a much more definite attempt to increase the number and significance of such incidental relationships has taken place in the last five years. Furthermore, there is an increasing attempt to have the teacher of each subject so aware of possibilities that all opportunities for reasonable relationship may be utilized."

The present study, it appears, is related to curriculum organization. According to the above, incidental teaching is going to continue to be a device for promoting correlation. The question still persists as to the most efficient application.

Summary

The study and consideration of others in regard to the value of incidental teaching seems to vary. The technique is advocated, but efforts to measure the effectiveness yield, in most instances, gains which are not significant. In instances where more direct methods have been used, more significant gains have been reported. However, the consensus seems to indicate that incidental teaching will continue to be used as a teaching device.
CHAPTER III
DESCRIPTION OF EXPERIMENT

Groups Considered

One hundred and ten tenth-grade high school sophomores were selected for this experiment. They were naturally divided into two groups by virtue of the curriculum in which they were enrolled; namely, College Preparatory and Commercial. Control and instructional sections were set up consisting of approximately one-half of each group.

Group one consisted of fifty-two pupils in two business curriculum classes studying a required social studies course termed "Study of Nations". There were about two-thirds more girls than boys. Comparison of the I. Q. scores on the Otis Quick-Scoring Mental Ability Test\(^1\) proved the control and the instructional groups to be similar. The mean chronological age of the instructional group was 15-7.6 years, as compared to 15-7.1 years for the control group, according to the ages from student record cards. This group met four times weekly for rotating periods of fifty-five minutes. Both classes were taught by the same instructor with similar aims and objectives, except for the teaching

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\(^1\) Published by World Book Company, Yonkers-on-Hudson, New York, 1937
of spelling incidentally to the instructional class.

Group two consisted of fifty-eight pupils in two College Preparatory curriculum classes studying a required course of study termed "Study of Nations". This group consisted of about two-thirds more girls than boys. Comparison of the I.Q. scores on the Otis Quick-Scoring Mental Ability Test proved the control and instructional groups to be similar. The mean chronological age of the instructional group was 15.2.9 years, as compared to 14.11.9 years for the control group, according to ages from school records. This group met two times weekly for rotating periods of fifty-five minutes. Both classes were taught by the same instructor with similar aims and objectives, except for the teaching of spelling incidentally to the instructional class.

It was not possible to equate the experimental and control sections of either group for spelling or social studies ability and still retain the desired number for the experiment.

The text material covered in the Social Studies instruction for both groups consisted of one hundred one pages from the text book, Story of Nations.

Controlled Factors

An attempt was made within the necessary confines of the classes taught by the one instructor, to control the following factors for both the experimental and control groups of this experiment.

1. The same teacher taught all concerned.

2. The level of ability of all students was established by the Otis Quick-Scoring Mental Ability Test. The experimental and control sections were equated within the two groups on this basis.

3. The level of achievement in spelling and social studies was established at the beginning as a base for measuring the effect of the experimental factor on these two areas. Attempts to equate the sections proved to be inadequate, and for this reason, all pretest and retest scores were treated with a statistical technique to determine the amount gained for each group.

4. The chronological ages were ascertained and the sections equated on this factor.

5. The length of class periods for all were the same.

6. The number of class meetings for Group One, control and experimental class, were equal, being four times weekly and totaling 56 for the experiment. The number of class meetings for Group Two correspond, being twice weekly and totaling 28 for the experiment.

7. The educational objectives for the two groups were similar within the groups.

8. The same objectives in teaching were maintained.

Spelling and Social Studies Instruments Used

To measure spelling level at the beginning of this study and spelling achievement at the end, the Progressive
Achievement Spelling Tests,\textsuperscript{1} Forms A and B, were used from the advance battery of tests. This test is devised for grades 9 to 14 inclusive. This standardized test has percentile norms for the tenth-grade level. Form A was used to pretest and Form B for retest purposes.

To measure the Social Studies level at the beginning and end of the textbook study on Great Britain and Germany, an objective type non-standardized test was constructed and used. This test\textsuperscript{2} required one hundred eighty-eight responses. Fifty-five of these were of the true-false variety, one hundred nine of the completion type, and twenty-four of the matching type aided recall variety.

This non-standardized test was constructed with care by the instructor the year before this experiment was conducted. The one hundred eighty-eight items were devised to test for "understanding objectives" of the Study of Nations classes taught. Two Social Studies teachers checked each item and certain questions were revised as a result.

In further justification of this testing instrument, it should be noted that the required time for taking the test

\textsuperscript{1} Tiegs, E.W. and Clerk, W.W., \textit{Progressive Achievement Tests, Advanced Battery, California Test Bureau, Los Angeles, California}

\textsuperscript{2} A copy of this test will be found in the Appendix
was over one hour and fifteen minutes. Test scores for classes taking this test both years showed the instrument to be consistent by stability of score and at least face valid from the point of view of curriculum objectives.

For purposes of this study, it will be assumed and considered that this objective Social Studies test is a valid measuring device for the subject matter studied.

**Duration of Experiment**

The Otis Quick-Scoring Mental Ability Gamma Test was administered during the third week in October 1946. The pretests for Spelling and Social Studies were given the last week in October, 1946 and instruction began November, 1946. The experiment was completed February 21, 1947 after Group One had completed fifty-six meetings, and Group Two, twenty-eight meetings. This span of time includes the time devoted for retesting.

**Plan of Incidental Teaching**

The general procedure of teaching spelling incidentally in the two experimental groups of this study utilized two psychological learning factors of motivation and habit. During the Social Studies class period, care was taken not to use more than five minutes in consideration of spelling.

Motivation was used by praising correct spelling in the
experimental sections. The Business section was frequently reminded that accuracy would be expected in the "Business World"; the College section, that correct spelling was a requirement for collegiate scholarship.

A few minutes were allowed to check written work for misspelled words. Those who felt sure they had not made errors in spelling were asked to raise their hands. The instructor took a moment to scan one or two of these papers and offer praise when accuracy or improvement were noted.

All written work, including examinations, was corrected for spelling. Misspelled words were underlined, or when no errors were noted, a comment was written, such as "Good Spelling" or "spelling correct". A letter mark for spelling was used along with a letter mark for Social Studies, so that each paper returned was marked, for example, "Spelling A, Social Studies B".

The habit factor was promoted by the use of "Demon Lists" which each student in the experimental group kept before him during the class period. When examination and test papers were returned at the beginning of the class period with corrected spelling, each student wrote misspelled words correctly on the "Demon List". If no words were misspelled, the student listed words in the past assignment which were troublesome.

Before any written work was collected, a brief moment
was given to scanning the paper by each pupil for detection of careless errors or doubtful spelling. Four dictionaries were available and students were encouraged to bring their own and use them.

The instructor was careful to write on the black-board new words, or words being discussed in connection with the subject, pointing out unusual spelling. Proper pronunciation was listened for in oral talks by all members of the class. That mispronounced words usually result in misspelled words, was aptly demonstrated in each experimental group on several occasions.

Care was taken that all four classes were conducted the same except for the incidental spelling. Insofar as it was possible, the same words, the same questions for discussion, and the same textbook reading assignments were covered in both control and experimental groups.

Procedure for Gaining Data

The purpose of this study is to measure the influence of the teaching of spelling incidentally on two Social Studies classes. There were four classes available allowing for an instructional and control class in two groups which were similar in educational objectives. Group one consisted of two classes in the Business curriculum at the tenth-grade level. Group two consisted of two classes in the
College Preparatory curriculum at the tenth-grade level.

The procedure was to pretest all four classes in spelling achievement and Social Studies achievement. All four groups studied the same textbook material. In each instructional group spelling was taught as an incidental feature. At the close of the experiment each class was retested for spelling and Social Studies achievement.

Data were thus gained showing the increase in spelling achievement and Social Studies achievement as indicated from a standardized spelling test of two forms and the teacher-made Social Studies objective type test.

**Treatment of Data**

Measures of central tendency and dispersion were computed for each test instrument used with the experimental and control sections. The average amount of gain and loss for each section was computed for comparison where the precision and controls were not accurate. In this way, gains or losses resulting from the incidental teaching of spelling were determined.

Data treated consisted of the following from both experimental and control sections of each group:

1. I.Q. scores from the Otis Quick-Scoring Mental Ability Test.
2. Chronological ages.

3. Pretest scores in spelling from the Progressive Achievement Spelling Test, Form A.

4. Pretest scores in Social Studies achievement from the objective, non-standardized, teacher-made tests.

5. Retest scores in spelling from the Progressive Achievement Spelling Test, Form B.

6. Retest scores in Social Studies achievement from the objective, non-standardized, teacher-made tests.

Criterion for Critical Ratio

In the interpretation of the data derived from this investigation, a critical ratio of 3.0 or better was considered statistically significant, in keeping with the following thought. Mills states:

"If a given difference between hypothetical and observed values would occur as a result of chance only one time out of one hundred, or less frequently, we may say that the difference is significant. This means that the results are not consistent with the hypothesis we have set up. If the discrepancy between theory and observation might occur more frequently than one time out of one hundred solely because of the play of chance, we may say the difference is not clearly significant. The results are not inconsistent with the hypothesis. The value of T (the difference between the hypothetical value and the observed mean, in units of the standard

\[ T \]

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\[ Mills, Frederick C., Statistical Methods (Revised), Henry Holt and Company, New York, 1938, p. 471 \]
error of the mean) corresponding to a probability of 1/100 is 2.576. One hundredth part of the area under a normal curve lies at a distance from the mean, on the axis, of 2.576 standard deviations or more. Accordingly, tests of significance may be applied with direct reference to T, interpreted as a normal deviate (i.e., as a deviation from the mean of a normal distribution expressed in units of standard deviation). A value of T of 2.576 or more indicates a significant difference, while a value of less than 2.576 indicates that the results are not inconsistent with the hypothesis in question."

The .26 per cent level of significance selected in this study for evaluation of the critical ratio findings means that a difference of this magnitude could occur by chance but once in 376 experiments run with identical conditions. Therefore, since the chance occurrence is so small, the conclusion will be that the difference is due to the experimental factors, and not to chance.

Summary

This chapter describes the College and Commercial groups in this experiment in detail. There was a control and experimental section in each group. Both groups were taught by the same instructor and studied the same text book material with similar objectives. The experimental classes were taught spelling incidentally.

The College group met twice a week for the fourteen weeks of the experiment, whereas the Business group met four times per week for a total of fifty-six meetings. The I.Q. scores show the College Preparatory group to be "brighter"
but within each group the experimental and control classes were similar.

The .26 per cent level of significance, a critical ratio of 3.0 was selected for the evaluation of the critical ratio in this study.

Data were obtained by determining the gains on pretest scores over retest scores in spelling and social studies. Comparison between the experimental and control sections for the central tendencies and dispersions, as well as mean gains, losses, and non-gains on pretests provided the statistical pattern for measuring the effect of the experimental factor.
CHAPTER IV
CHAPTER IV
TREATMENT OF THE DATA

The data in this chapter will be concerned with the effect of the incidental teaching of spelling on spelling achievement and social studies attainment in two tenth-grade Social Studies classes.

Description of the Groups

The students involved in this experiment consist of one hundred ten tenth-grade pupils studying a required course of "Study of Nations". There are two groups, equated on the basis of I.Q. scores and chronological ages divided into two sections to make a control and experimental section in each group.

Distribution of Chronological Ages

Group One is composed of Business Curriculum pupils, and Group Two is made up of College Preparatory students. To describe these two groups more in detail, the distribution of chronological ages is shown in Table One.
### TABLE I
DISTRIBUTION OF CHRONOLOGICAL AGES OF THE BUSINESS AND COLLEGE GROUPS, EXPERIMENTAL AND CONTROL SECTIONS, FOR ONE HUNDRED TEN TENTH-GRAGE STUDENTS

<table>
<thead>
<tr>
<th>Group</th>
<th>Experimental Section</th>
<th>Control Section</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>S.D.</td>
</tr>
<tr>
<td>Group One</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Business</td>
<td>15-7.6</td>
<td>8.72</td>
</tr>
<tr>
<td>Group Two</td>
<td></td>
<td></td>
</tr>
<tr>
<td>College</td>
<td>15-2.9</td>
<td>4.46</td>
</tr>
</tbody>
</table>

The mean chronological age of the experimental section, Business Group was 15 years 7.6 months with a standard deviation of 8.7 months. Similarity of the mean age and standard deviation for the control section is to be observed. Based on chronological ages, it is possible to say these are nearly homogeneous sections.

The mean chronological age of the experimental section, College Group was 15 years 2.9 months with a standard deviation of 4.46 months as compared with the mean age of 14 years 11.9 months and a S.D. of 5.82 months for the control section.

The M. of 15 years and 2.9 months and S.D. of 4.46 months of the College Group, experimental section, indicates that the chronological ages spread from 15 years 7.36 months to 14 years 10.44 months sixty-eight per cent of the time. The control section, College Group, with a M. of 14 years 11.9 months and a S.D. of 5.82 months indicates these sections are very similar.
Distribution of Intelligence Scores

The Otis Quick-Scoring Test of Mental Ability was administered to both sections of groups one and two. Table Two points out the mean and standard deviation of the Otis I.Q. scores for these two groups.

**TABLE 2**
MEANS, STANDARD DEVIATIONS, AND STANDARD ERROR OF SCORES ON THE OTIS QUICK-SCORING TEST OF MENTAL ABILITY OF THE BUSINESS AND COLLEGE GROUPS, EXPERIMENTAL AND CONTROL SECTIONS FOR ONE HUNDRED TEN TENTH-GRADE STUDENTS

<table>
<thead>
<tr>
<th>Measures</th>
<th>College Group</th>
<th>Business Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Experimental</td>
<td>Control</td>
</tr>
<tr>
<td>Mean</td>
<td>109.38</td>
<td>109.35</td>
</tr>
<tr>
<td>S.E. m</td>
<td>± 0.603</td>
<td>± 0.583</td>
</tr>
<tr>
<td>S.D.</td>
<td>3.20</td>
<td>3.25</td>
</tr>
<tr>
<td>S.E. σ</td>
<td>± 0.421</td>
<td>± 0.412</td>
</tr>
</tbody>
</table>

Table Two presents the groups which were obtained as a result of equating approximately ninety-five per cent of the members of each class on the basis of I.Q. scores and chronological ages. The five per cent not included were extreme cases. These were omitted to obtain groups, at the beginning, which would be more similar in respect to I.Q. scores and chronological ages.

The mean Otis I.Q. of the experimental section, College Group, was 109.38 with an error of the mean of ± 0.603, or, the true mean lies between 108.777 and 109.983 sixty-eight per cent of the time. The spread of scores indicates that this group falls within the normal range.
The mean Otis I.Q. of 109.35 with a S.D. of 3.25 for the control section of this College Group indicates 68 percent of this group falls between Otis I.Q. scores of 106.10 and 112.60. The two sections of the College group are considered very homogeneous and highly similar for both the S.D. and errors of the measures show this point.

The Business Group, experimental section, had a mean Otis I.Q. of 97.38 with a S.D. of 3.24, while the control section had a mean Otis I.Q. of 97.92 and a S.D. of 3.69. Both the spread of scores and the errors of these measures indicate the degree of homogeneity of the Business Group students used in this experiment.

To compare the two groups, the mean Otis I.Q. of 109.38 for the experimental section of the College Group and the mean Otis I.Q. of 97.38 for the Business Group, experimental section, indicates the difference in types of groups used in this study. The mean difference of 12.00 between the Otis I.Q. scores of these two groups over the standard error of the difference of 0.877 points out the significant difference between the College and the Business Group in regard to mental ability.

Spelling Pretest and Retest Data

Business Group

The Progressive Achievement Spelling Test, Form A, was administered to the Business Group, control and experi-
mental sections, at the beginning of this experiment as a pretest. This was done to ascertain the level of spelling achievement at the outset.

**TABLE 3**

MEANS AND STANDARD DEVIATION OF THE SCORES ON THE PROGRESSIVE ACHIEVEMENT SPELLING PRETEST (Form A) FOR THE EXPERIMENTAL AND CONTROL SECTIONS OF THE TENTH GRADE BUSINESS GROUP

<table>
<thead>
<tr>
<th>Measures</th>
<th>Experimental Section</th>
<th>Control Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>13.42</td>
<td>17.02</td>
</tr>
<tr>
<td>S.E.m</td>
<td>£0.631</td>
<td>£0.516</td>
</tr>
<tr>
<td>S.D.</td>
<td>3.22</td>
<td>2.58</td>
</tr>
<tr>
<td>S.E.σ</td>
<td>£0.445</td>
<td>£0.364</td>
</tr>
</tbody>
</table>

Table Three indicates that at the beginning of this experiment the Business Group, control section, was more advanced in spelling, as measured by the Progressive Achievement Spelling Test. The comparison of the mean of 17.02 for the control section with a S.D. of 2.58 and a Mean of 13.42 with a S.D. of 3.22 for the experimental section proves this.

The error of the mean for the control section of £0.516 indicates that the true mean lies between 16.504 and 17.536 sixty-eight per cent of the time. The true mean for the experimental section falls between 12.789 and 14.051 sixty-eight per cent of the time.
The standard deviation for the control section of 2.58 and the S.D. for the experimental section of 3.22 shows that sixty-eight per cent of the students scored between 19.60 to 14.44 in the control section spelling test and between 16.64 to 10.20 in the experimental section on the Progressive Achievement Spelling pretest.

The standard error of the S.D. for the control section indicates that the S.D. for similar groups, will fall within 2.216 and 2.944 sixty-eight per cent of the time.

After teaching incidental spelling to the experimental section a retest to measure spelling achievement was administered. Table Four shows the results.

<table>
<thead>
<tr>
<th>TABLE 4</th>
<th>MEANS AND STANDARD DEVIATIONS OF THE PROGRESSIVE ACHIEVEMENT SPELLING RETEST (Form B) FOR THE EXPERIMENTAL AND CONTROL SECTIONS OF THE TENTH-GRADE BUSINESS GROUP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measures</td>
<td>Experimental Section</td>
</tr>
<tr>
<td>Mean</td>
<td>14.42</td>
</tr>
<tr>
<td>S.E.m</td>
<td>£0.501</td>
</tr>
<tr>
<td>S.D.</td>
<td>2.56</td>
</tr>
<tr>
<td>S.E.σ</td>
<td>£0.354</td>
</tr>
</tbody>
</table>

Table Four shows that at the end of this experiment the Business Group, control section, maintained a superiority in spelling over the experimental section as measured by the Progressive Spelling retest. However, this original
difference had been reduced by slight gains for the experimental section according to comparison of Tables Three and Four.

Attention is invited to the mean scores of 13.42 and 14.42 of the experimental section on the spelling pretest and retest, Tables Three and Four. This represents an average gain of one additional correctly spelled word per pupil on the Progressive Achievement Spelling retest after having received incidental instruction in spelling for fifty-six class meetings.

The standard deviation of 3.22 on the pretest showed sixty-eight per cent of the experimental section scored between 16.64 and 10.24 as compared to a mean range from 16.98 to 11.86 after instruction, based on a S.D. of 2.56 for the retest scores. This indicates that, after incidental spelling instruction, the dispersion of scores for the experimental group was reduced in comparison to pretest scores.

To examine the difference between retest and pretest scores from a basis of gains, non-gains, and losses between the control and experimental sections of the Business Group, all individual variations between pretest and retest scores were computed and may be compared in the following table.
TABLE 5
MEAN GAINS, LOSSES, AND STUDENTS WHO NEITHER GAINED NOR LOST IN THE EXPERIMENTAL AND CONTROL SECTIONS OF THE BUSINESS GROUP OF TENTH-GRADE STUDENTS USING THE PROGRESSIVE ACHIEVEMENT SPELLING TESTS, FORM A AND FORM B

<table>
<thead>
<tr>
<th>Business Group</th>
<th>No. of Students Who Gained in Spelling Score</th>
<th>Mean Gain</th>
<th>No. of Students Who Lost in Spelling Score</th>
<th>Mean Loss</th>
<th>No. of Students With No Gains or Losses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental Section</td>
<td>14</td>
<td>3.21</td>
<td>7</td>
<td>3.0</td>
<td>5</td>
</tr>
<tr>
<td>Control Section</td>
<td>12</td>
<td>3.18</td>
<td>11</td>
<td>3.59</td>
<td>2</td>
</tr>
</tbody>
</table>

The above table shows two more pupils gained, four less pupils lost, and three more students neither gained nor lost in the Business experimental section than in the control section. This numerical advantage for the experimental section is shown to be slight when the mean gains and mean losses are observed between the experimental and control sections.

To determine the significance of the difference of the mean gains between the control and experimental sections of the Business Group using the Progressive Achievement Spelling Test, all individual gains between pretest and retest scores were computed and compared in the following table.
TABLE 6
SIGNIFICANCE OF THE DIFFERENCE OF MEAN GAINS USING THE PROGRESSIVE ACHIEVEMENT SPELLING PRETEST-RETEST SCORES FOR THE EXPERIMENTAL AND CONTROL SECTIONS OF THE BUSINESS GROUP

<table>
<thead>
<tr>
<th>M_e</th>
<th>σ_{me}</th>
<th>σ_e</th>
<th>Diff. M_e - M_c</th>
<th>S.E. Diff.</th>
<th>C.R.</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.21</td>
<td>0.547</td>
<td>2.04</td>
<td>0.03</td>
<td>0.792</td>
<td>0.037</td>
</tr>
<tr>
<td>M_c</td>
<td>σ_{mc}</td>
<td>σ_c</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.18</td>
<td>0.572</td>
<td>1.90</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The above table shows the difference of 0.03 between the mean gains for the experimental and control sections, Business Group, using the Progressive Achievement Spelling Test over the standard error of the difference of 0.792 resulted in a critical ratio of 0.037. The difference is not considered significant.

In similar fashion, the significance of the difference of mean losses between the control and experimental sections of the Business Group were computed and compared in Table 7.

TABLE 7
SIGNIFICANCE OF THE DIFFERENCE OF MEAN LOSSES USING THE PROGRESSIVE ACHIEVEMENT SPELLING RETEST-PRETEST SCORES FOR THE EXPERIMENTAL AND CONTROL SECTIONS OF THE BUSINESS GROUP

<table>
<thead>
<tr>
<th>M_e</th>
<th>σ_{me}</th>
<th>σ_e</th>
<th>Diff. M_e - M_c</th>
<th>S.E. Diff.</th>
<th>C.R.</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.0</td>
<td>0.35</td>
<td>1.00</td>
<td>0.59</td>
<td>0.61</td>
<td>0.967</td>
</tr>
<tr>
<td>M_c</td>
<td>σ_{mc}</td>
<td>σ_c</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.59</td>
<td>0.50</td>
<td>1.68</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The above table shows the difference of 0.59 between the mean losses for the experimental and control sections using
the Progressive Achievement Spelling pretest-retest scores as the basis. The critical ratio of 0.967, although favoring the experimental section for least loss, is not significant and might have occurred by chance.

**College Group**

The data portrayed and explained above were obtained in a similar way for the College Group in this experiment. The Progressive Achievement Spelling Test, Form A and Form B, was used similarly as a pretest-retest device to measure spelling achievement at the beginning and end of this experiment.

<table>
<thead>
<tr>
<th>TABLE 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>MEANS AND STANDARD DEVIATIONS OF THE SCORES ON THE PROGRESSIVE ACHIEVEMENT SPELLING PRETEST (Form A) FOR THE EXPERIMENTAL AND CONTROL SECTIONS OF THE TENTH GRADE COLLEGE GROUP</td>
</tr>
<tr>
<td>Measures</td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td>Mean</td>
</tr>
<tr>
<td>S.E.m</td>
</tr>
<tr>
<td>S.D.</td>
</tr>
<tr>
<td>S.E.σ</td>
</tr>
</tbody>
</table>

Table Eight shows the college group, experimental section, to be more advanced in spelling at the start of this experiment. A comparison of the group scores on the Progressive Achievement Spelling Test shows the experimental section with a mean of 22.14 and a standard deviation of 3.15 and the control section with a mean of 21.02, S.D. of 2.55.
The measures of central tendency and dispersion were computed and are compared in Table Nine for the Progressive Achievement Spelling Retest, Form B, used with the experimental and control sections of the College Group.

**TABLE 9**
MEANS AND STANDARD DEVIATIONS OF THE SCORES ON THE PROGRESSIVE ACHIEVEMENT SPELLING RETEST (Form B) FOR THE EXPERIMENTAL AND CONTROL SECTIONS OF THE TENTH-GRADE COLLEGE GROUP

<table>
<thead>
<tr>
<th>Measures</th>
<th>Experimental Section</th>
<th>Control Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>23.57</td>
<td>21.22</td>
</tr>
<tr>
<td>S.E._m</td>
<td>0.639</td>
<td>0.482</td>
</tr>
<tr>
<td>S.D.</td>
<td>3.39</td>
<td>2.69</td>
</tr>
<tr>
<td>S.E.</td>
<td>0.452</td>
<td>0.341</td>
</tr>
</tbody>
</table>

To determine the difference between pretest and retest scores all gains, non-gains, and losses between the individual scores of the control and experimental sections of the College Group were computed and are shown in Table Ten.
Table 10 shows variations between pretest and retest scores for each individual in the experimental and control section of the College Group. In the experimental section, six more students scored gains, ten less scored losses, and one additional student neither lost nor gained, as compared to the control section. This numerical advantage is decreased by the mean gain being less for the experimental section; however, the mean loss is shown to be smaller for this section.

This indicates that, in spite of six more people gaining, the gains of these six students were offset by larger gains for fewer students in the control section. Also the ten additional students scoring losses in the control section scored only 0.96 larger mean losses.

To note whether any significant difference in mean gains was to be found between the experimental and control
sections' performance on the Progressive Achievement Spelling pretest and retest, the mean gain and standard error of the differences are compared in the following table.

**TABLE 11**
SIGNIFICANCE OF THE DIFFERENCE OF MEAN GAINS ON PROGRESSIVE ACHIEVEMENT SPELLING PRETEST-RETEST. SCORES OF EXPERIMENTAL AND CONTROL SECTIONS FOR THE COLLEGE GROUP

<table>
<thead>
<tr>
<th></th>
<th>( M_e )</th>
<th>( \sigma_{me} )</th>
<th>( \sigma_e )</th>
<th>Diff. ( M_e - M_c )</th>
<th>S.E. Diff.</th>
<th>C.R.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.61</td>
<td>0.351</td>
<td>1.49</td>
<td></td>
<td>1.22</td>
<td>0.586</td>
<td>2.0819</td>
</tr>
<tr>
<td>3.83</td>
<td>0.472</td>
<td>1.64</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The above table shows the difference of 1.22 between the mean gains for the experimental and control sections, College Group, using the Progressive Achievement Spelling Test, over the standard error of the difference of 0.586 resulting in a critical ratio of 2.0819. This ratio indicates that the control section gained more when only gains between pretest and retest scores are considered. This difference of 2.0819 is of doubtful significance, but it should be noted that the average gain is in excess of one more correctly spelled word for the control section.

Similarly, the significance of the difference of mean losses between experimental and control sections for all individual losses between pretest and retest scores were computed and may be compared in the following table.
TABLE 12
SIGNIFICANCE OF THE DIFFERENCE OF MEAN LOSSES USING THE PROGRESSIVE ACHIEVEMENT SPELLING PRETEST-RETEST SCORES FOR THE EXPERIMENTAL AND CONTROL SECTIONS OF THE COLLEGE GROUP

<table>
<thead>
<tr>
<th>Me</th>
<th>σme</th>
<th>Se</th>
<th>Diff. Me - Mc</th>
<th>S.E. Diff.</th>
<th>C.R.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.25</td>
<td>0.530</td>
<td>2.01</td>
<td>0.96</td>
<td>0.765</td>
<td>1.254</td>
</tr>
<tr>
<td>Mc</td>
<td>σmc</td>
<td>Sc</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.21</td>
<td>0.545</td>
<td>1.09</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table Twelve shows the difference of 0.96 between the mean losses for the experimental and control sections, College Group, using the Progressive Achievement Spelling Test over the standard error of the difference of 0.765 resulting in a critical ratio of 1.254. This indicates that the experimental section scored fewer losses than the control, but this difference is not significant on the basis of the losses alone.

Social Studies Pretest-Retest Data

Business Group

The procedure discussed above regarding spelling was duplicated for Social Studies. It should be noted, however, that all students showed gains in the retest scores, thus only a comparison of gains will be necessary.

The instrument used was an objective type, non-standardized, teacher-constructed test consisting of one hundred eighty-eight items. This test is described fully in
Chapter Three. At the beginning of the experiment, a pretest was administered to find the level of Social Studies achievement. The pretest scores are shown in the following table.

**TABLE 13**

MEANS AND STANDARD DEVIATIONS OF THE SCORES ON THE OBJECTIVE SOCIAL STUDIES PRETEST FOR THE EXPERIMENTAL AND CONTROL SECTIONS OF THE TENTH-GRADE BUSINESS GROUP

<table>
<thead>
<tr>
<th>Measures</th>
<th>Experimental Section</th>
<th>Control Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>24.77</td>
<td>21.61</td>
</tr>
<tr>
<td>$S.E._m$</td>
<td>0.554</td>
<td>0.559</td>
</tr>
<tr>
<td>$S.D.$</td>
<td>2.87</td>
<td>2.80</td>
</tr>
<tr>
<td>$S.E._\sigma$</td>
<td>0.393</td>
<td>0.394</td>
</tr>
</tbody>
</table>

The above table shows that in the beginning of this study the experimental section was more advanced than the control section, as measured by the objective Social Studies pretest. The comparison of the mean of 24.77 for the experimental section and a standard deviation of 2.87 with a mean of 21.61 and a S.D. of 2.80 for the control section proves this.

The error of the mean for the experimental section of 0.554 indicates the true mean lies between 24.216 and 25.324 sixty-eight per cent of the time. The true mean for the control section lies between 21.051 and 22.169 sixty-eight per cent of the time.
The standard deviation for the experimental section of 2.87 and the S.D. for the control section of 2.80 shows that sixty-eight per cent of the students scored between 21.90 and 27.64 in the experimental section and between 18.81 and 24.41 in the control section on the objective Social Studies pretest.

The standard error of the S.D. for the experimental section indicates that the S.D. for similar groups will fall within 3.263 and 2.477 sixty-eight per cent of the time.

At the completion of fifty-six class meetings a retest of the objective Social Studies Test was administered. The following table shows the results.

<table>
<thead>
<tr>
<th>Measures</th>
<th>Experimental Section</th>
<th>Control Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>54.17</td>
<td>45.89</td>
</tr>
<tr>
<td>S.E. m</td>
<td>£0.654</td>
<td>£0.636</td>
</tr>
<tr>
<td>S.D.</td>
<td>3.34</td>
<td>3.18</td>
</tr>
<tr>
<td>S.E. S</td>
<td>£0.464</td>
<td>£0.449</td>
</tr>
</tbody>
</table>

The above table shows that in the Business Group, at the end of this experiment, the experimental section increased its superiority in Social Studies over the control group as measured by the objective Social Studies retest.
Whereas on the pretest the experimental section averaged slightly better than three correct responses over the control section mean score, on the retest the experimental section averaged better than eight correct responses on the Social Studies objective retest over the mean scores of the control group on the retest.

In determining the significance of the difference of mean gains between the control and the experimental sections of the Business Group using the Social Studies objective test, all individual gains between pretest and retest scores were computed. The comparison of these scores is portrayed in the following table.

| TABLE 15 |
| SIGNIFICANCE OF THE DIFFERENCE OF MEAN GAINS USING THE OBJECTIVE SOCIAL STUDIES PRETEST-RETEST SCORES FOR THE EXPERIMENTAL AND CONTROL SECTIONS OF THE BUSINESS GROUP |

<table>
<thead>
<tr>
<th>$M_e$</th>
<th>$\sigma_{m_e}$</th>
<th>$\sigma_e$</th>
<th>Diff.</th>
<th>S.E.</th>
<th>C.R.</th>
</tr>
</thead>
<tbody>
<tr>
<td>57.85</td>
<td>0.470</td>
<td>2.40</td>
<td>$M_e - M_c$</td>
<td>10.45</td>
<td>0.701</td>
</tr>
<tr>
<td>$M_c$</td>
<td>$\sigma_{m_c}$</td>
<td>$\sigma_c$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>47.40</td>
<td>0.518</td>
<td>2.59</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The above table shows the difference of 10.45 between the mean gains for the experimental and control sections, Business Group, using the objective Social Studies test over the standard error of the difference of 0.701 resulting in a critical ratio of 14.907. This difference is highly significant, in favor of the experimental section of the
Business Group.

College Group

The data just described for the Business Group was obtained in a similar way for the College Group in this experiment. The objective Social Studies test was used as a pretest-retest measure to gauge Social Studies achievement at the beginning and the end of this study. The following table shows the beginning Social Studies scores for the College Group.

<table>
<thead>
<tr>
<th>Measures</th>
<th>Experimental Section</th>
<th>Control Section</th>
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<tbody>
<tr>
<td>Mean</td>
<td>28.98</td>
<td>29.07</td>
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<tr>
<td>S.E.(m)</td>
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<td>0.466</td>
</tr>
<tr>
<td>S.D.</td>
<td>1.87</td>
<td>2.60</td>
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<tr>
<td>S.E.(\sigma)</td>
<td>0.242</td>
<td>0.324</td>
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</tbody>
</table>

The above table shows that in the beginning of this experiment, both sections of the College Group were at about the same level in Social Studies, as measured by the objective Social Studies pretest. The comparison of the mean of 28.98 for the experimental section with a standard deviation of 1.87, and a mean of 29.07 with a standard deviation of 2.60 for the control section shows this.
At the completion of twenty-eight class meetings, a retest of the objective Social Studies test was administered. The following table portrays the results.

**TABLE 17**

**MEANS AND STANDARD DEVIATION OF THE SCORES ON THE OBJECTIVE SOCIAL STUDIES RETEST FOR THE EXPERIMENTAL AND CONTROL SECTIONS OF THE TENTH-GRADE COLLEGE GROUP**

<table>
<thead>
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<td>£0.570</td>
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<td>2.18</td>
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<tr>
<td>$S.E.\sigma$</td>
<td>£0.465</td>
<td>£0.403</td>
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The above table shows the experimental section to be somewhat more advanced in Social Studies at the end of this experiment, as measured by the objective Social Studies retest. Whereas these two sections scored means of but 0.09 difference on the pretest, the experimental section is 2.25 different on the mean retest score of the objective Social Studies retest after twenty-eight class meetings for the college group.

The significance of the difference of mean gains between the control and experimental sections of the College group were determined by using the objective Social Studies test to compute individual gains between pretest-retest scores. The comparison of gains for each section is shown in the following table.
The above table shows the difference of 4.60 between the mean gains for the experimental and control sections, College Group, using the objective Social Studies test over the standard error of the difference of 0.615 resulting in a critical ratio of 7.479. This difference is clearly significant at the .26 per cent level selected at the outset of this study for the measure of significance.

Summary

The two groups, Business and College, equated on a basis of chronological ages and scores on the Otis Quick-Scoring Test of Mental Ability were compared with scores on pretests and retests of the Progressive Achievement Spelling Test, Forms A and B. Measures of central tendency and dispersion were shown graphically.

Frequency tables showing numbers of students who gained in spelling, or neither gained nor lost, or lost, were shown for differences between individual pretest and retest spelling scores with measures of central tendency and dispersion. Standard errors for mean losses, mean gains, and
standard deviations were indicated in tables with the critical ratios for differences in mean gains and losses in the experimental and control sections of both groups.

The same measures were used for pretest and retest scores of the objective Social Studies teacher-constructed test. In that both experimental and control sections in the two groups scored gains on the objective Social Studies retest, it was necessary to compare for gains only.

In regard to the data portrayed in this chapter, the following items were most notable:

1. Significant differences were not noted in the Business and College groups between experimental and control sections on a basis of spelling scores. Tables Five, Six, and Seven show data for the Business Group Progressive Achievement Spelling pretests and retests. Critical ratios of 0.037 and 0.967 for mean gains and losses respectively prove there was no significant difference between the experimental and control sections. Tables Ten, Eleven, and Twelve show the data for mean gains and losses on the spelling tests for the College group. Critical ratios of 2.0819 and 1.254 for mean gains and losses respectively are shown. The C.R. of 2.0819 favors the College control section. This is of doubtful significance favoring the experimental section when mean losses are compared.
2. Highly significant differences in mean gains were noted in both Business and College experimental sections for Social Studies achievement in comparison to the control sections. Tables fifteen and eighteen show critical ratios were scored of 14.907 for the Business experimental section, and 7.479 for the College experimental section when the comparison was mean gains on the objective Social Studies retest scores.

3. The mean gain between College and Business experimental sections varied approximately in direct proportion to the time involved; i.e., the Business experimental section showed about twice the extent of mean gain in relation to the College experimental section, which met one-half the number of class meetings in comparison to the Business experimental section.
CHAPTER V
CHAPTER V

SUMMARY AND CONCLUSIONS

The purpose of this study was to learn the effect of one type of incidental teaching of spelling in two Social Studies classes on spelling achievement and Social Studies attainment.

The fact that teachers are charged with accomplishing a complex number of educational and subject-course-study aims in the brief periods of time allotted necessitates incidental teaching. The question arises as to whether this method is productive of results.

One hundred ten tenth-grade high school sophomores assigned to one instructor in four classes of "Study of Nations" were the subjects. Two groups, College and Business, were designated, with control and experimental sections in each group.

The groups were equated on the basis of chronological ages and Otis I. Q. scores. The College group met twice weekly and the Business group four times, for periods of one hour. Each group consisted of about two-thirds more girls than boys.

The plan was to conduct pretests before instruction in spelling and social studies. After fourteen weeks of incidental instruction in spelling in the experimental
[No text on this page]
sections, retests in spelling and social studies were administered. The Progressive Achievement Spelling Test, Form A and Form B, with an objective, teacher-made Social Studies test were the instruments used for determining the effect of the experimental factor.

Insofar as possible, all sections in this experiment were taught alike, with the exception of the two experimental sections. These were taught spelling incidentally to the Social Studies instruction.

Motivation, habit, and brevity were the keynotes to the incidental teaching of spelling. An attempt was made to arouse interest in spelling in line with the student's educational objectives. Praise was given for accurate spelling. The habits of checking written work, and keeping "Demon Lists" were developed by allowing time at the beginning of each period to list misspelled words from previous written work which had been marked by the instructor. The time allowed for incidental teaching was less than five minutes in each experimental section.

The data for finding the effect of the experimental factor were obtained from pretest and retest scores in spelling and social studies. The individual retest scores were examined for gains, losses, and non-gains over the beginning pretest scores. Critical ratios were computed to determine significant differences in comparing mean
gains and mean losses where they occurred in the experimental and control sections of both groups. A critical ratio of 3.00 or better was considered to be statistically significant.

Findings

When the final measure was spelling achievement, it was shown that no true difference was noted in either the College or Business Group between experimental and control sections in regard to spelling.

When the final measure was Social Studies achievement, a true difference existed between the experimental and control sections of both Business and College groups. The experimental sections, in which incidental teaching of spelling was used as the experimental factor, were found to have highly significant differences in Social Studies achievement.

In the Social Studies area, the Business group, experimental section, scored the larger amount of mean gain. Considering that this group met twice as many class periods as the College experimental section, it is noted that the mean gain on pretest scores on the objective Social Studies test increased in about direct proportion to the time spent in the classroom.
Conclusions

Within the reliability and validity of the techniques and procedures used in this investigation, the following conclusions seem warranted.

1. Sections in which incidental teaching of spelling of the type used in this study showed no significant gain in spelling achievement when compared to a control group in which no incidental spelling instruction was administered. This conclusion is subject to some qualification because of the inconsistencies found as a result of careful study of the frequency and quantity of gains, losses, and non-gains between experimental and control sections of the College Group on the Progressive Achievement Spelling Test, pretest and retest scores.

Although a significance of doubtful value at the 2.66 per cent level was found in favor of the control section in comparing mean gains on spelling retest scores, the amount of these gains were established by fewer numbers of students. Stated otherwise, this tends to show that the use of incidental instruction in the experimental section resulted in small gains for a larger number of students. In either case, the significant differences are of doubtful proportions, and more data are needed.
to prove the effectiveness of teaching spelling incidentally.

2. The experimental sections in both College and Business Groups showed significantly larger gains in Social Studies achievement when compared with control sections in which no incidental teaching of spelling was practised. This conclusion is not subject to qualification, as highly significant critical ratios above 7.40 were found.

Whether these gains in the Social Studies achievement resulted solely from the incidental teaching of spelling is problematical. It might be that gains were scored in Social Studies attainment as a result of increased attention gained in the experimental sections by the incidental teaching method.

3. The length of time in the classroom in teaching spelling incidentally appears to be a determining factor in the amount of achievement in Social Studies. This conclusion is subject to qualifications, in that no significant difference was obtained in spelling achievement where normally some effect would be expected.
CHAPTER VI
CHAPTER VI

LIMITATIONS OF THIS STUDY AND NEED FOR FURTHER RESEARCH

This experiment was undertaken in four classes assigned to an instructor. An attempt was made to meet the standards of educational research, and much roughness is apparent.

Inadequacies of This Study

1. The student population for this experiment is typical of only a portion of tenth-grade curricula; namely, College Preparatory and Business. It might have been more meaningful if the sample were larger and composed of other grades and curricula. There is an assumption present that tenth-grade College Preparatory students will not become Business or General Terminal students in the eleventh or twelfth grades.

2. The duration of this study is not adequate. Any attempt to accurately measure the effect of one teaching technique in relation to another should involve more class meetings and be conducted in more than the winter season, when absence and sickness in the school population are more pronounced.

3. In equating the groups on the basis of I.Q. and chrono-
logical ages only, it was not feasible to compare mean pretest-retest scores between the experimental and control sections. It would have been better to equate on a basis of spelling ability and Social Studies ability also. To equate on the basis of reading ability might have added more meaningful results.

4. The procedure of using a pretest for obtaining a base score from which to gauge results is open to error. Students not informed as to why they are being tested are prone to perform half-heartedly, and, if informed, might reason that their mark would benefit by a less ambitious performance on pretests.

5. The objective Social Studies test, even though carefully constructed and refined as described in Chapter Three, was not a completely reliable instrument. Two forms of this test would have reduced the crudeness in this instance.

6. The technique for the incidental teaching was poorly defined as to time, emphasis, and procedure. Much of such a technique is a matter of judgment. Perhaps involving more than one teacher in such a study would be an advantage in this respect.

7. That the incidental teaching of spelling was really the experimental factor may be doubted. It is uncertain that spelling can be taught without word meaning entering
the instruction. It might have produced clearer results if incidental vocabulary instruction had been chosen as the area for training.

Suggestions for Further Research

It would be impossible, after witnessing the confusion in Civic Education instruction as described in Chapter One, not to consider incidental teaching as a fertile area for further research. It may serve to lessen this confusion if consideration is given to some of the suggestions listed below.

1. It might be of value to repeat this experiment for different grades, correcting the above items which tend to limit the accuracy of such a study.

2. It might be of value to determine the effect of incidental teaching on influencing attitudes, habits, or other communication skills. In view of the fact that this and other studies show that skills are not susceptible to gain from incidental teaching, it is possible that the areas of attitudes and habits would be more so.

3. It might be enlightening to study the effect of incidental teaching where emotional appeal is used in developing respect, tolerance, or interest in things political.
4. It might be valuable to determine the effectiveness of audio-visual aids from the standpoint of incidental teaching in areas such as speech training or character education.

5. It might be valuable to determine the effectiveness of merely the time element in incidental learning on students of varying ability, sex, age, and educational objectives.

Implications For Teaching Procedures

It is apparent from this study that to direct incidental teaching towards the accomplishment of such educational aims as spelling skill is of little value. That the incidental teaching may affect the achievement in the subject objectives might be the case, as was found in this study, but more likely a well planned and related procedure for keeping students alert and attentive seems to be the causative factor.

On the basis of this study, the incidental teaching of skills similar to spelling cannot be recommended. It seems apparent that if incidental teaching is to be used in a productive manner, it will be a starting point from which to develop individualized drill by the student outside of the classroom.
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BIBLIOGRAPHY

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**PROGRESSIVE ACHIEVEMENT SPELLING TEST**

**Form A**

**Directions:** I shall give you some spelling words. I shall pronounce the word, use it in a sentence, and then pronounce it again. Then you will write only the word on the line.

1. grocery  I just returned from the GROCERY store.
2. doubt  We DOUBT whether we shall be able to go.
3. concert  We went to the music CONCERT last night.
4. accident  Mary had an automobile ACCIDENT last week.
5. electricity  ELECTRICITY has many different uses.
6. genuine  My sister has a GENUINE diamond.
7. material  The dressmaker ruined the MATERIAL.
8. emperor  The EMPEROR was a tyrant.
9. grateful  I am very GRATEFUL for your assistance.
10. disease  Chickenpox is a contagious DISEASE.
11. sensible  Elsie is a SENSIBLE girl.
12. isthmus  The Isthmus of Panama connects North and South America.
13. artificial  Helen wore ARTIFICIAL flowers.
14. persevere  To PERSEVERE means to persist.
15. convenient  It is CONVENIENT to have a meeting.
16. orchestra  The High School ORCHESTRA is playing.
17. resemblance  She bears some RESEMBLANCE to her grandmother.
18. immense  The waves were IMMENSE.
19. millinery  Her sister owns a MILLINERY store.
20. parallel  Draw a line PARALLEL to the edge.
21. recommend  We RECOMMEND that he be transferred.
22. mischievous  My sister has a MISCHIEVOUS kitten.
23. sufficiently  She has recovered SUFFICIENTLY to return to school.
24. apologize  He came to APOLOGIZE for his error.
25. kerosene  Mother has an old KEROSENE stove.
26. guarantee  I had to GUARANTEE her account at the store.
27. syndicate  They organized a financial SYNDICATE.
28. souvenir  She brought a beautiful SOUVENIR from Europe.
29. inflammable  Gasoline is an INFLAMMABLE liquid.
30. conscientious  His folks are very CONSCIENTIOUS people.
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</table>
Directions -- I shall give you some spelling words. I shall pronounce the word, use it in a sentence, and then pronounce it again. Then you will write only the word on the line.

1. motion  The car was in MOTION.
2. arrive  We may not ARRIVE in time.
3. believe  We BELIEVE that he will go.
4. estimate  He cannot ESTIMATE the cost.
5. deceive  Do not DECEIVE yourself.
6. exception  This is an EXCEPTION to the rule.
7. issue  You may ISSUE two books.
8. elegant  He lives in an ELEGANT apartment.
9. interfere  I shall not interfere with his plans.
10. fatigue  He suffered great FATIGUE.
11. vehicle  The VEHICLE was an old model.
12. cordially  John greeted him CORDIALLY.
13. associate  He introduced his ASSOCIATE.
14. peculiar  This is a PECULIAR situation.
15. development  The child's DEVELOPMENT was rapid.
16. parliament  He entered PARLIAMENT at an early age.
17. recommend  I do not RECOMMEND her work.
18. leopard  The LEOPARD sprang from the tree.
19. extraordinary  Washington had EXTRAORDINARY skill
20. physician  John became a PHYSICIAN.
21. allege  He will ALLEGRO that it is true.
22. municipal  This is a MUNICIPAL election.
23. vaguely  The explanation was VAGUELY stated.
24. discipline  Military DISCIPLINE is strict.
25. immediately  The doctor came IMMEDIATELY.
26. incessant  My friend is an INCESSANT talker.
27. chauffeur  I do not have a CHAUFFEUR.
28. embarrassment  He suffered great EMBARRASSMENT.
29. miscellaneous  He had a MISCELLANEOUS collection of toys.
30. disension  There is DISENSION in the conference.
OTIS QUICK-SCORING MENTAL ABILITY TESTS

By Arthur S. Otis, Ph.D.

Formerly Development Specialist with Advisory Board, General Staff, United States War Department

GAMMA TEST: FORM AM

For Senior High Schools and Colleges

Score......

Read this page. Do what it tells you to do.

Do not open this booklet, or turn it over, until you are told to do so.

Fill these blanks, giving your name, age, birthday, etc. Write plainly.

Name.......................................................... Age last birthday ...... years
First name, initial, and last name

Birthday.............................. Teacher....................... Date.............. 19......
Month Day

Grade.............. School................................ City

This is a test to see how well you can think. It contains questions of different kinds. Here are three sample questions. Five answers are given under each question. Read each question and decide which of the five answers below it is the right answer.

Sample a: Which one of the five things below is soft?

1) glass 2) stone 3) cotton 4) iron 5) ice

The right answer, of course, is cotton; so the word cotton is underlined. And the word cotton is No. 3; so a heavy mark has been put in the space under the 3 at the right. This is the way you are to answer the questions.

Try the next sample question yourself. Do not write the answer; just draw a line under it and then put a heavy mark in the space under the right number.

Sample b: A robin is a kind of—

6) plant 7) bird 8) worm 9) fish 10) flower

The answer is bird; so you should have drawn a line under the word bird, and bird is No. 7; so you should have put a heavy mark in the space under the 7. Try this one:

Sample c: Which one of the five numbers below is larger than 55?

1) 53 2) 48 3) 29 4) 57 5) 16

The answer, of course, is 57; so you should have drawn a line under 57, and that is No. 14; so you should have put a heavy mark in the space under the 14.

The test contains 80 questions. You are not expected to be able to answer all of them, but do the best you can. You will be allowed half an hour after the examiner tells you to begin. Try to get as many right as possible. Be careful not to go so fast that you make mistakes. Do not spend too much time on any one question. No questions about the test will be answered by the examiner after the test begins. Lay your pencil down.

Do not turn this booklet until you are told to begin.

Patent No. 1,586,628

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**ANSWER SHEET**

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**NOTE:** This Answer Sheet is not intended for machine scoring. [ 2 ]
1. The opposite of hate is —
   1 enemy  2 fear  3 love  4 friend  5 joy

2. If 2 pencils cost 5 cents, how many pencils can be bought for 50 cents?
   5 100  7 10  9 20  11 25  13 5

3. A dog does not always have —
   11 eyes  12 bones  13 a nose  14 a collar  15 lungs

4. A recollection that is indefinite and uncertain may be said to be —
   16 forgotten  17 secure  18 vague  19 imminent  20 fond

5. Which of these words would come first in the dictionary?
   22 more  23 pile  24 mist  25 pick  26 mine

6. A fox most resembles a —
   27 pig  28 goat  29 wolf  30 tiger  31 cat

7. Gold is more costly than silver because it is —
   32 heavier  33 scarcer  34 yellower  35 harder  36 prettier

8. The first drawing below is related to the second in the same way that the third one is to
   one of the remaining four. Which one?

   This is to this as this is to —

9. A radio is related to a telephone in the same way that (?) is to a railroad train.
   37 a highway  38 an airplane  39 gasoline  40 speed  41 noise

10. The opposite of wasteful is —
   42 wealthy  43 quiet  44 stingy  45 economical  46 extravagant

11. A debate always involves —
   47 an audience  48 judges  49 a prize  50 a controversy  51 an auditorium

12. A party consisted of a man and his wife, his two sons and their wives, and four children
    in each son's family. How many were there in the party?
   52 7 53 8 54 12 55 13 56 14

13. One number is wrong in the following series.
    1 5 2 6 3 7 4 9 5 9
    What should that number be?
   57 9 58 7 59 8 60 10 61 5

14. A school is most likely to have —
   62 maps  63 books  64 a janitor  65 a teacher  66 a blackboard

15. What letter in the word WASHINGTON is the same number in the word (counting
    from the beginning) as it is in the alphabet?
   67 A  68 N  69 G  70 T  71 O

16. Which word makes the truest sentence? Fathers are (?) wiser than their sons.
   72 always  73 usually  74 much  75 rarely  76 never

17. Four of these five things are alike in some way. Which one is not like the other four?
   1 nut  2 turnip  3 rose  4 apple  5 potatoes

18. The opposite of frequently is —
   8 occasionally  7 seldom  6 never  9 periodically  10 often

19. This is to this as this is to —

20. At a dinner there is always —
   16 soup  17 wine  18 food  19 waiters  20 dishes

21. If 10 boxes full of apples weigh 400 pounds, and each box when empty weighs 4 pounds,
    how many pounds do all the apples weigh?
   21 40 22 360 23 396 24 400 25 404

(Go right on to the next page.)
22. If a boy can run at the rate of 5 feet in \(\frac{1}{3}\) of a second, how many feet can he run in 10 seconds?
\[\text{\(1\) \(50\) \(250\) \(2\) \(25\)}\]

23. A thermometer is related to temperature as a speedometer is to —
\[\text{\(1\) fast \(2\) automobile \(3\) velocity \(4\) time \(5\) heat.}\]

24. “State of changing place” is a good definition for —
\[\text{\(1\) advancement \(2\) retardation \(3\) rotation \(4\) motion \(5\) revision.}\]

25. If the first two statements following are true, the third is (?)
All residents in this block are Republicans.
Smith is not a Republican. Smith resides in this block.
\[\text{\(4\) true \(2\) false \(3\) not certain.}\]

26. If the words below were arranged to make a good sentence, with what letter
would the second word of the sentence begin?
same means big large the as
\[\text{\(a\) \(b\) \(m\) \(s\) \(t\).}\]

27. Sunlight is to darkness as (?) is to stillness.
\[\text{\(q\) quiet \(s\) sound \(d\) dark \(l\) loud \(m\) moonlight.}\]

28. A grandmother is always (?) than her granddaughter.
\[\text{\(s\) smarter \(m\) more quiet \(o\) older \(s\) smaller \(s\) slower.}\]

29. Such things as looks, dress, likes, and dislikes indicate one’s —
\[\text{\(a\) character \(w\) wisdom \(p\) personality \(g\) gossip \(r\) reputation.}\]

30. A tree always has —
\[\text{\(l\) leaves \(f\) fruit \(b\) buds \(r\) roots \(a\) a shadow.}\]

31. In general it is safest to judge a man’s character by his —
\[\text{\(v\) voice \(c\) clothes \(d\) deeds \(w\) wealth \(f\) face.}\]

32. Which of these words is related to many as exceptional is to ordinary?
\[\text{\(a\) none \(e\) each \(m\) more \(s\) much \(f\) few.}\]

33. This is to this as this is to —
\[\text{\(s\) same \(p\) the same \(o\) the opposite \(n\) neither same nor opposite.}\]

34. What is related to a cube in the same way that a circle is related to a square?
\[\text{\(c\) circumference \(c\) corners \(s\) sphere \(s\) solid \(t\) thickness.}\]

35. Which one of these pairs of words is most unlike the other three?
\[\text{\(r\) run \(f\) fast \(l\) large \(b\) loan \(l\) lend \(b\) buy \(p\) purchase.}\]

36. The opposite of awkward is —
\[\text{\(a\) strong \(p\) pretty \(g\) graceful \(s\) short \(w\) swift.}\]

37. The two words superfluous and requisite mean —
\[\text{\(t\) the same \(o\) the opposite \(w\) neither same nor opposite.}\]

38. Of the five words below, four are alike in a certain way. Which one is not like these four?
\[\text{\(p\) push \(h\) hold \(l\) lift \(d\) drag \(a\) pull.}\]

39. The idea that the earth is flat is —
\[\text{\(a\) absurd \(m\) misleading \(i\) improbable \(u\) unfair \(w\) wicked.}\]

40. The opposite of loyal is —
\[\text{\(t\) treacherous \(e\) enemy \(t\) thief \(c\) coward \(j\) jealous.}\]

41. The moon is related to the earth as the earth is to —
\[\text{\(m\) Mars \(s\) the sun \(c\) clouds \(s\) stars \(u\) the universe.}\]

42. The opposite of sorrow is —
\[\text{\(f\) fun \(s\) success \(j\) joy \(p\) prosperity \(h\) hope.}\]

43. If the first two statements are true, the third is (?)
Frank is older than George. James is older than Frank.
George is younger than James.
\[\text{\(t\) true \(f\) false \(n\) not certain.}\]

44. If \(2\frac{1}{2}\) yards of cloth cost 30 cents, what will 10 yards cost?
\[\text{\(d\) \$1.20 \(s\) 75\(\text{c}\) \(q\) 40\(\text{c}\) \(d\) \$3.00 \(d\) 37\(\frac{1}{2}\)\(\text{c}\).}\]

45. Congest means to bring together, condole means to grieve together.
Therefore con means —
\[\text{\(t\) to bring \(t\) together \(g\) to grieve \(d\) to bring or grieve together.}\]
46. The law of gravitation is —
   ⑥ obsolete  ⑦ absolute  ⑧ approximate  ⑨ conditional  ⑩ constitutional

47. Oil is toil as (?) is to hate.
   ⑪ love  ⑫ work  ⑬ boil  ⑭ ate  ⑮ hat

48. If 4¾ yards of cloth cost 90 cents, what will 3½ yards cost?
   ⑯ $3.15  ⑰ 86½¢  ⑱ 70¢  ⑲ 89¢  ⑳ 35¢

49. Which number in this series appears a second time nearest the beginning?
   6 4 5 3 7 8 0 9 5 8 8 6 5 4 7 3 0 8 9 1
   ① 9  ② 0  ③ 8  ④ 6  ⑤ 5

50. This   is to this   as this   is to —
      "  "  "  "

51. If the first two statements following are true, the third is (?)
   Some of our citizens are Methodists. Some of our citizens are doctors.
   Some of our citizens are Methodist doctors.
   ① true  ② false  ③ not certain

52. Which one of the five words below is most unlike the other four?
   ① fast  ② agile  ③ run  ④ quick  ⑤ speedy

53. One who says things he knows to be wrong is said to be —
   ① careless  ② misled  ③ concealed  ④ untruthful  ⑤ prejudiced

54. If the words below were arranged to make the best sentence, with what letter would the last word of the sentence end?
   sincerity traits courtesy character of desirable and are
   ⑩ r  ⑪ y  ⑫ s  ⑬ e  ⑭ d

55. If a strip of cloth 36 inches long will shrink to 33 inches when washed, how many inches long will a 48-inch strip be after shrinking?
   ① 47  ② 44  ③ 45  ④ 46  ⑤ 45½

56. Which of these expressions is most unlike the other three?
   ① draw pictures  ② clean house  ③ come home  ④ work problems

57. If the following words were seen on a wall by looking at a mirror on the opposite wall, which word would appear exactly the same as if seen directly?
   ① MEET  ② ROTOR  ③ MAMA  ④ DEED  ⑤ TOOT

58. Find the two letters in the word ACTOR which have just as many letters between them in the word as in the alphabet. Which one of these two letters comes first in the alphabet?
   ⑥ A  ⑦ C  ⑧ T  ⑨ O  ⑩ R

59. A surface is related to a line as a line is to a —
   ④ solid  ⑦ plane  ⑨ curve  ⑩ point  ⑪ string

60. One number is wrong in the following series.
   1  2  4  7  11  16  23
   What should that number be?
   ⑨ ⑩ ⑪ ⑫ ⑬ ⑭ ⑮ ⑯ ⑰ ⑱ ⑲ ⑳ ㉑

61. This   is to this   as this   is to —
      "  "  "  "

62. How many of the following words can be made from the letters in the word STRANGLE, using any letter any number of times?
   greatest, tangle, garage, stresses, related, grease, nearest, reeling
   ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪

63. Which of the following is a trait of character?
   ① reputation  ② wealth  ③ influence  ④ fickleness  ⑤ strength

(Go right on to the next page.)
64. A statement the meaning of which is not definite is said to be —
   © erroneous © doubtful © ambiguous © distorted © hypothetical

65. Evolution is to revolution as crawl is to —
   ©1 baby ©2 floor ©3 stand ©4 run ©5 hands and knees

66. Coming is to came as now is to —
   ©2 today ©3 some time ©5 tomorrow ©6 before now ©8 hereafter

67. One number is wrong in the following series.
   1 2 4 8 16 32 64 96
   What should that number be?
   ©1 3 ©2 6 ©3 12 ©4 48 ©5 128

68. If George can ride a bicycle 60 feet while Frank runs 40 feet, how many feet can George ride while Frank runs 30 feet?
   ©1 50 ©2 10 ©3 45 ©4 20 ©5 70

69. What letter is the fourth letter to the left of the letter which is midway between D and I in the word REPRODUCTION?
   ©1 C ©2 R ©3 O ©4 N ©5 D

70. Which of the five things following is most like these three: ivory, snow, and milk?
   ©2 butter ©3 rain ©4 cold ©5 cotton ©6 water

71. A hotel serves a mixture of 2 parts cream and 3 parts milk.
   How many pints of milk will it take to make 25 pints of the mixture?
   ©1 25 ©2 16 3 ©3 15 ©4 12 3 ©5 10

72. A man who spends his money lavishly for non-essentials is considered to be —
   ©2 fortunate ©2 thrifty ©3 extravagant ©4 generous ©5 economical

73. This [ ] is to this [ ] as this [ ] is to —
   ©1 ©2 ©3 ©4 ©5 ©6 ©7 ©8

74. If the first two statements following are true, the third is (?)
   One cannot become a good violinist without much practice. Charles practices much on the violin. Charles will become a good violinist.
   ©2 true ©3 false ©4 not certain

75. Which of these expressions is most unlike the other three?
   ©4 small to tiny ©5 pretty to beautiful ©6 warm to hot ©7 excellent to good

76. If the words below were rearranged to make a good sentence, the fifth word in the sentence would begin with what letter?
   life friends valuable to The make asset in a is ability
   ©1 l ©2 f ©3 v ©4 t ©5 a

77. What number is in the space that is in the rectangle and in the triangle but not in the circle?
   ©1 1 ©2 2 ©3 3 ©4 4 ©5 5

78. What number is in the same geometrical figure or figures (and no others) as the number 6?
   ©1 1 ©2 2 ©3 3 ©4 4 ©5 5

79. How many numbers are there each of which is in two geometrical figures but only two?
   ©1 1 ©2 2 ©3 3 ©4 4 ©5 5

80. If a wire 40 inches long is to be cut so that one piece is \( \frac{5}{6} \) as long as the other piece, how long must the shorter piece be?
   ©1 \( 26\frac{2}{3} \) in. ©2 \( 39\frac{3}{4} \) in. ©3 18 in. ©4 24 in. ©5 16 in.
Part 1

Directions — To the left of each statement below, write plus (+) if true or probably true; write minus (-) if false or probably false.

1. All Englishmen could be British, but all British are not English.

2. The British control all inlets into the Mediterranean Sea.

3. Once the British Isles were part of the Continent of Europe.

4. Traces of Roman Civilization still left in England show the Romans conquered the Celtic Britons easily.

5. The Saxons were good settlers.

6. Christianity was first taught in England during the time of the Saxons.

7. The Magna Charta is important because the common people benefited for the first time in an act by the British Government.

8. The British are seamen principally because they lacked the metals for weapons and were forced to go abroad in ships for the needed ores.

9. William the Conqueror laid the foundation of the English nation by bringing the small kingdoms together into a strong central government.

10. Cromwell was a dictator but refused to become King.

11. William and Mary refused to sign the Bill of Rights.

12. A part of the U. S. Constitution is called the Bill of Rights.

13. Henry VIII could be called the Father of the Church of England.

14. Queen Elizabeth, unlike her father, tried to restore the Roman Catholic Church in England.

15. The Industrial Revolution started in England about 1750 and is still going on.
16. One reason why the change in production from hand to machines took place in England was because of their superior scientists.

17. Spain and France were easily defeated by England in the race for colonies.

18. The Industrial Revolution served to spur the British on in gaining colonies.

19. Hadrian's Wall was built to keep the fierce Welchmen from raiding the early Romans.

20. No part of the British Isles is more than 100 miles from water.

21. The Gulf Stream helps keep the British warm in winter.

22. The mountains on the British Isles are mostly in the east and south.

23. The choppy water of the English Channel is an unimportant fact in British history.

24. Parliament grew from the King's Council.

25. The President of the U. S. is elected the same as the Prime Minister of Great Britain.

26. The House of Lords has become the most powerful part of Parliament.

27. The King of England can advise, warn and instruct his ministers publicly.

28. The Commonwealth of Nations are as separate nations and make their own laws.

29. All members of the Commonwealth of Nations supported Britain in the recent war.

30. The British like pomp and ceremony, but do not like to boast of their achievement.

31. At one time, the British were the only large nation fighting the Nazis.

32. Our time for holding elections to governmental positions is similar to Great Britain's.
33. A characteristic of the British Isles is abundant rain and seldom very cold or warm climate.

34. The British are crowded for living space more than any other European nation.

35. The Tory Government believed in a strong central government with the House of Commons being the dominant part of Parliament.

36. The Australian Ballot was first used in Great Britain.

37. The present King of England is of German ancestry.

38. Britain has gained her present possessions by discovery and conquest.

39. Cecil Rhodes was prominent as an empire builder and was known as "Rhodes Colossus".

40. Even after "D-Day", there was a large vocal movement on the part of the British people to sue for peace with Hitler.

41. The British have helped the Dutch to save their Empire in the Dutch Indies.

42. Disraeli is famous for engineering the Suez Canal and buying the controlling shares of stock from the French.

43. The British never drafted Indians for war service, in the recent war.

44. British India includes all of the Indian territory on the Peninsular of India.

45. Russia wants to fortify the Dardenelles, because Britain fortifies Gibraltar and Suez.

46. The British are anxious to have the Jews in Europe settle in Palistine, yet not rile the Arab population to anger.

47. The British Empire at its greatest included 1/4 of the earth's surface and 1/5 of the earth's people.

48. All the British authorities on finance believe that Britain must get a loan of $3,000,000,000 to survive.

49. Winston Churchill was a member of Parliament, and represented the Conservatives during the war.
50. The precedent for our present patent laws in the U. S. comes from Great Britain.


52. Canada produces enough manufactured products for her population.

53. The provinces of Quebec and British Columbia are the most thickly populated in Canada.

54. The Indians in New Delhi are faced with somewhat similar problems as was the United States from 1787 to 1791.

55. The British have one of the oldest forms of government in the world today.
Part 2

Directions — Complete the following sentences by supplying the correct information. Where a question is asked, give a brief answer.

1. The specific part of the U. S. Constitution which contains most of the democratic freedoms we inherited from the British is

2. The type of law which we inherited from the British is known as

3. The church most like the Church of England in the United States is called

4. Britain's form of government may be most correctly described as a

5. The most famous British author was named

6. Britain's largest possession in the Western Hemisphere is

7. Britain's most populous possession in 1940 was

8. The continent that Britain possesses as part of her empire is

9. The man who fought against the British in the Boer War and is presently the leader in South Africa is

10. The principal farming pursuit in Australia is

11. Great Britain gained most of her possessions after the first World War through mandates granted by

12. The British Commonwealth of Nations consists of what six countries?

   1. 3. 5.

   2. 4.

13. Which British possession remained neutral in the recent war?

14. One British possession in the Western Hemisphere which fought in the 18th Century for its independence from Great Britain was
15. The Industrial Revolution was a change in methods of production from hand to

16. The first American invention which aided the textile industry was

17. The British scientist connected with the dynamo is

18. William and Mary agreed to the provisions of before becoming the rulers of Britain.

19. The recent Battle of Britain had a precedent in the 16th Century when was defeated.

20. In 1066 William of Normandy became

21. The present Prime Minister of Britain is

22. The Minister of Foreign Affairs is

23. The political party in Britain presently in power is

24. In his last visit to the U. S., Winston Churchill proposed that the U. S., in the interest of World Peace,

25. President Wilson advocated war on Germany in 1917 because

26. Russia may justly criticise Britain's refusal to allow her to control the Dardanelles, because Britain controls and in the Mediterranean Sea.

27. The Queen most responsible for gaining Britain's empire was

28. Two famous British artistic painters were and

29. Two famous British scientists were and

30. Our U. S. businessmen have benefited from the loan to Great Britain because

31. Authorities in the United States have pointed out that a permanent alliance with the U. S. and Great Britain is unnecessary because

32. The part of the British Empire which was most upset over the fall of Singapore in 1942 was

33. The last successful invasion of Britain was by people called
34. The biggest single factor in the realm of defense of the Empire has been

35. In comparison to other European countries, there is a noticeable lack of great men in the field of in Britain.

36. Besides India, famine is a problem in a European British sphere of influence, namely

37. An important principle in the Hindu religion is the belief in

38. The British Viceroy representative to India who did most for Indian freedom is

39. Besides the Moslems, the group which does not want the British to leave India is

40. The biggest single factor in stimulating the Industrial Revolution in England was

41. In relation to comparative area of other countries, Canada ranks

42. Comparing population, Canada has nearly as many people as our State of

43. The present Prime Minister of Canada is

44. An outspoken critic of Great Britain in the U. S. Senate is a Senator from Florida named

45. The method of voting secretly in elections and legislative bodies used in the U. S. originated in

46. Most of the early inventions by the British were concerned with the making of
PART I

1. In what direction do most of the rivers in Germany flow?

2. The only natural resource the Germans have in great quantity is

3. The mountains in Germany are mainly located in what section of the country?

4. The most prominent of the early small German states was , which later became

5. What occurrence around 1800 caused Prussia to regard the French as enemies?

6. The German state which never united willingly with the Fatherland was

7. Germany is smaller in area than our State of

8. Germany made up for her lack of natural resources by

9. After World War I the Germans changed their government from Dictatorship to

10. Hitler's speeches will be remembered because of his genius for

11. Nazism was opposed to, and originated to fight against, the form of government called

12. Hitler educated his people to hate the Treaty of and the People.

13. What geographic fact accounts for German accomplishment in art and music?

14. Who is the famous German scientist who ran from Hitler, and helped us win the war?

15. The three countries on Germany's western border which suffered most by German invasion are

16. Germany benefited by cheap water transportation from her rivers and

17. In Germany, boys and girls not going to college were compelled to
18. The Father of Socialism was named

19. In government, the Germans contributed a good example to the world in the way they governed their

20. The river that played a historic part in German history is

21. List 5 countries in Europe before 1875 which the German State of Brandenburg - Prussia had waged war with.
   1.
   2.
   3.
   4.
   5.

22. List 5 men before 1917 who helped make Germany a strong military nation.
   1.
   2.
   3.
   4.
   5.

23. List 3 countries which are on the Southern borders of Germany.
   1.
   2.
   3.

24. List 5 practices the Nazis used to maintain their power.
   1.
   2.
   3.
   4.
   5.

25. List 3 innovations the Germans have started in education.
   1.
   2.
   3.

26. Give a synonym or a brief explanation of the following terms.
   1. Swastika
   2. Erzatz
   3. Herrenvolk
   4. Antisemitism
   5. Verboten
   6. Blood and Iron
   7. Treaty of Versailles
   8. Weimar Republic
   9. Munich Conference
  10. Reformation
Place in the blank space in the left-hand column the number of the item in the right-hand column which most nearly agrees.

( ) 1. 40 miles of romance 1. The First Unifier of Germany
( ) 2. Black Forest 2. Rulers of Austria
( ) 3. Prince Metternich 3. Connecting North Sea & Baltic
( ) 4. Kiel Canal 4. The Great Elector
( ) 5. Thirty Years War 5. The Rhine River
( ) 6. Frederick William 6. The Friend of Voltaire
( ) 7. Brandenburg 7. Prime Minister of Austria
( ) 8. Hohenzollern Family 8. Rulers of Prussia
( ) 9. Hapsburg Family 9. Southwestern Germany
(10) Napoleon I 10. Conflict over religion
(11) Frederick the Great 11. Northeast Germany
(12) Otto von Bismarck 12. Father of the German State
13. The Bavarian Leader

Place in the blank space in the left-hand column the number of the item in the right-hand column which most nearly agrees.

( ) 1. Durer 1. The Theory of Relativity
( ) 2. Martin Luther 2. Socialism
( ) 3. Goethe 3. Mein Kampf
( ) 4. Schiller 4. Snow White
( ) 5. Roentgen 5. Printing
( ) 6. Gutenberg 6. Blue Danube Waltz
( ) 7. Diesel 7. The Child Prodigy
(8) 8. Grimm 8. Faust
(9) 9. Hitler 9. Protestantism
(10) Marx 10. Engraving
(11) Einstein 11. Engines
(12) Mozart 12. William Tell
13. The X-ray