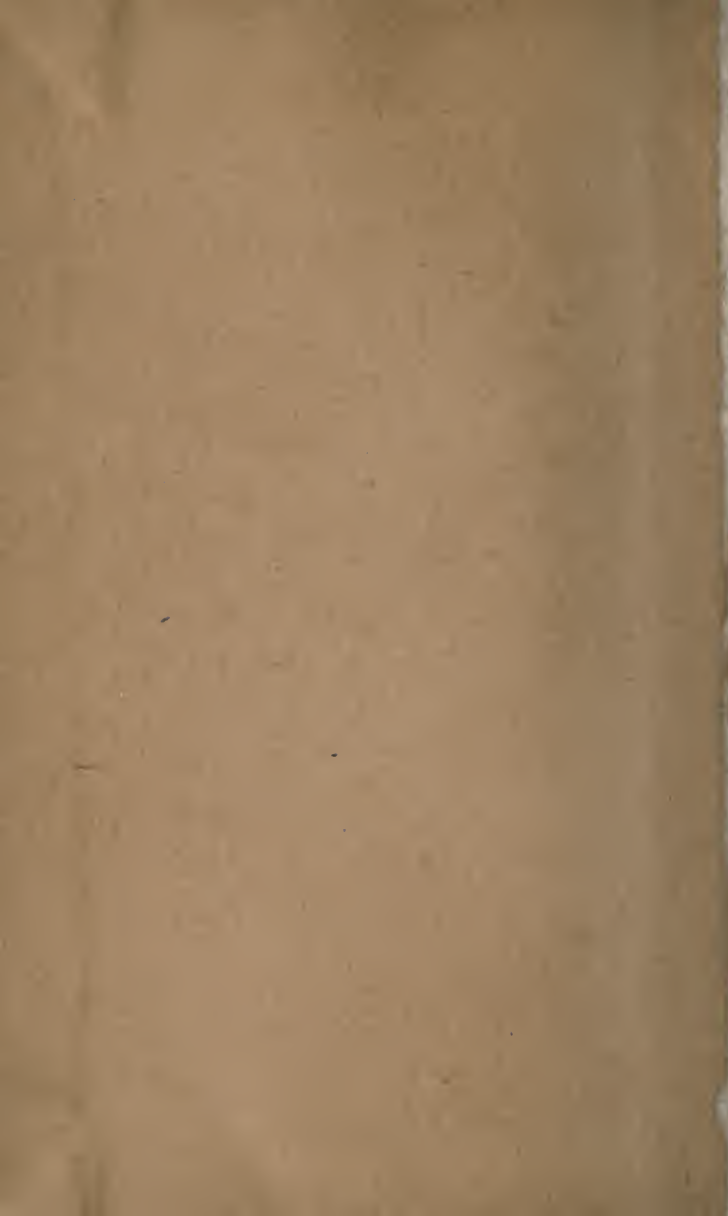


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blue

BY

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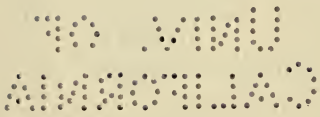
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TO MY PARENTS
JOHN E. GILBERT
REBECCA DIETZ GILBERT

PREFACE

THE purpose of this book is to bring together from all sources the more reliable and pertinent facts in the teaching of spelling, and to present them in their relation to the practical problems which the teacher has to face every day in the classroom.

The book is an outgrowth of a thesis on "The Experimental Studies of Spelling," which embodied an exhaustive study of some ninety investigations. In the preparation of the book, this material was supplemented by such information as could be gathered from the general literature of the subject, including books and articles on methods of teaching and on the psychology of learning, and the better spelling texts of the day. A third source of material was the author's three years' experience as an elementary school principal and supervisor in testing, evaluating, and applying in actual classroom work the conclusions of the preceding studies.

The author gratefully acknowledges his indebtedness to the many investigators and teachers whose fruitful labors have made this book possible. He is indebted, more especially, to Dean Thomas M. Balliet, of New York University, for suggesting the preparation of the book and aiding in its construction; to Dr. F. J. Kelly, Dean of the Department of Education, University of Kansas, Mr. F. S. Camp, Superintendent of Schools, Stamford, Connecticut, and Miss Alice Scott, Supervisor of Instruction, Elwood, Indiana, for reading the manuscript and offering many helpful suggestions; to Miss Nellie V. Wedderspoon, Miss Sara A. Ward, Miss Elizabeth M. Drumm, and Miss Helen A. Brown, teachers in

PREFACE

the Hart School, Stamford, Connecticut, for lesson plans; and to Mr. James M. Grainger, Head of the Department of English, State Normal School for Women, Farmville, Virginia, for reading the proof.

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THE TEACHING OF SPELLING

CHAPTER ONE

THE SELECTION AND CLASSIFICATION OF WORDS

THE TRADITIONAL SPELLING MATERIAL

THE study of spelling has value for the child just to the extent that the words learned are the words that the child uses or that he will use in the near future in doing the writing involved in carrying on the everyday affairs of life. This simple truth, so widely accepted today, was little understood in the past. As a consequence, curricula were filled with words of infrequent use and of unusual difficulty.

Large numbers of unusual words in spelling lists. The more recent offenders in this particular were the textbook makers and teachers, who by arbitrary selection, or by comparison with the results obtained by persons following similar methods of investigation, compiled long lists of words of special or limited use, including many technical terms from geography, history, government, law, medicine, physiology, and the like. This material came from many sources, but was most frequently taken from textbooks. The result of this method of selecting words is seen in the following groups of words taken almost at random from a speller in common use: dyspepsia, hydrophobia, sciatica, catarrh, eczema, rabies, gastritis, jaundice; macadamize, avoirdupois, imperturbable, inexplicable, porte-cochère.

Traces of the traditional material still found. Such compilations of words for spelling purposes, the product of a false conception of the aims and purposes of the teaching of spelling, have come down to us as a

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part of our inheritance from the past and have dominated the work of the school until quite recent years. Even yet traces of the traditional material are found in many schoolrooms. Time and effort spent in struggling for the mastery of words of this character are for the most part time and effort wasted. By dint of determined effort and persistent drill the child may be able to master these words and to retain them throughout his school life. But when the school doors finally close behind him the old knowledge and skill have little value; through disuse they soon pass away, while the child is left poorly equipped for the real demands of life.

THE SOURCE OF SPELLING MATERIAL

Improvement in the quality of spelling material depends upon the adoption of saner principles of selecting words. The first principle of importance concerns the source of material.

Hearing, reading, speaking, and writing vocabularies distinguished. Instead of constituting one large vocabulary of words, each word of which serves as occasion demands in the getting of thought in hearing and in reading, and the expression of thought in speaking and in writing, the words that we use are seen on closer observation to fall into four more or less distinct groups which form the vocabularies of hearing, reading, speaking, and writing. A word of one vocabulary may or may not be found in the other vocabularies. To illustrate, the word *face* is familiar to us, whether we hear it spoken, see it on the printed page, or use it in speaking or writing. The same is not true of *impregnable* or *imperturbable*. The meaning of either is apparent when heard or read. *Impregnable* is common enough, also, to occur in our speech, but I doubt if we should

take any liberties with *imperturbable*. Probably neither word would be used commonly in writing, certainly not by children.

In short, there are kinds and degrees of acquaintanceship with words as with friends. Some words are known to us only as we hear them spoken by other persons. Others are recognized in our reading but are strangers to our speaking and writing vocabularies. Finally, there are a few choice words with which we are so familiar that we use them with confidence to convey our thoughts to others. Among the latter are the words that we use in writing.

Words for spelling limited to the writing vocabulary. These distinctions between the hearing, speaking, reading, and writing vocabularies must be kept in mind in making word lists. It is evidently unwise to have a pupil spend the greater part of his spelling time upon words that appear only in his hearing, reading, or speaking vocabularies. Obviously, the words that a child needs to know how to spell are in the main the words that he uses in writing. While the words of the writing vocabulary are common to the hearing, speaking, and reading vocabularies, and while the growth of the writing vocabulary is probably by way of hearing or seeing to speaking and then to writing, the writing vocabulary does not by any means represent a random selection of words from the other groups; rather, it consists of a relatively small number of the words most useful to the child in expressing his own thoughts. To select words for spelling from the reading vocabulary, as is commonly done, may not result in very serious mistakes in the lower primary grades, but the principle leads to vicious consequences if carried far up in the grades.

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The writing vocabulary found in the spontaneous compositions of children and adults. The restriction of the field of spelling material to the words actually used in writing makes the task of selecting words simple and definite. The words to be chosen for special drill in spelling are primarily the words found in the written compositions of children. This provides for the child's present spelling needs. But, since it is our duty to anticipate in a measure the growing needs of the child, we must teach him also the words that he will probably use as an adult. These are in all probability the words that adults now use, and are found in their written compositions. In seeking to discover what words really form the child's vocabulary, only spontaneous compositions should be considered, for in literal reproductions large numbers of the unassimilated words of the text are certain to be brought into the written work.

Common words only to be taken for special study. Not all the words that children use spontaneously are of equal importance for spelling purposes. In general the words vary in value as the frequency of use. That is, only the commonest words should be chosen for special study. In addition to the infrequent words, certain others should be omitted; namely, words of temporary use, words that are too easy, and words that are too difficult for children to learn to spell. For infrequent, transient, and unusually difficult words the spelling should be indicated by the teacher when the word is required, or the children should use the dictionary as the occasion demands.

The advantages of taking the spelling material from the words most commonly used by children and adults in their spontaneous compositions are twofold: this procedure does away with the necessity for the arbitrary

exercise of opinion, which teachers have found to be a very difficult task; and it places the selecting of words upon a simple, natural, and matter-of-fact basis.

Class word lists prepared by the teacher. A common practice among teachers of making up word lists from the written work handed in from day to day is valuable only to the extent that the teacher succeeds in hitting upon the common words. It is doubtful if the teacher can do this for a large number of words. The practice is useful in the way of emphasizing local needs and special difficulties, but does not take the place of a list based upon extensive concrete investigations.

The work of choosing the commonest words from a series of compositions, while simple and straightforward, is exceedingly laborious and time-consuming, as any one who will undertake the task may discover for himself. To get typical results for a word list of any size, it is necessary to examine many thousands of running words. Unless there is a large amount of clerical assistance, the work is likely to extend into years. This makes it practically impossible for each teacher to work out extensive lists of words for herself. Fortunately, we have a number of reputable and extensive investigations which make the task unnecessary.

CONCRETE INVESTIGATIONS . . .

A minimum list of common words. For the purpose of reporting in this book, a comparative study was made of the six important investigations of the words commonly used by children and adults in their written compositions. These included: (1) the Jones list of 4532 words selected from an examination of more than 15,000,000 words in the themes of 1050 school children; (2) the Smith list of 1125 words, consisting of the

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commonest words in 75,000 running words in the spontaneous compositions of the public school children of Madison, Wisconsin; (3) the Cook and O'Shea list, comprising 3200 of the most frequently used words in the compositions of thirteen adults; (4) the 1000 commonest words found by W. E. Chancellor in letters received daily from many sources; (5) a list of 3470 common words compiled from many sources, including the list of Dr. Burk, prepared by C. K. Studley and Allison Ware; and (6) a list of 1000 words, prepared by Ayres by combining the results of four concrete studies.

The combined results of these six investigations are presented in Appendix B, which shows the words found in four or more studies. The total number of such words is 1254. This is the most reliable list of the words most commonly used by children and adults that can be made at the present time. The words may be taken as the minimum essentials of a course of study in spelling. In actual use it will be found necessary to supplement this list greatly.

SPELLING BOOKS FREQUENTLY SHOW A POOR SELECTION OF WORDS

Ayres' study of the N. E. A. lists. As compared with this and similar lists of words, what showing is made by the spellers in daily use by teachers? Attention has already been called to the fact that cursory examination of many of the popular spelling books reveals long lists of unusual words and technical terms taken indiscriminately from readers, histories, physiologies, geographies, and the like. When more detailed comparisons are made, the disparity between the words of textbooks and the words selected on the basis of concrete investigation appears more striking. On this

point Dr. Ayres reports a comparison of the words of the National Education Association spelling lists used in the famous Cleveland tests of 1908 with his study of the vocabularies of 2000 business and personal letters. The results of the comparison show that of the 414 words of the National Education Association list, only 125 were found in the 2000 letters analyzed, while 289, or 70 per cent of the words, did not appear even once.

A study of thirteen common spellers. The author has made a study of thirteen spellers now in general use to determine what per cent of the words of these spellers are contained in (a) the 3324 words common to two or more of the six investigations reported above, and (b) all the 6250 different words found in the several investigations. The comparisons were based upon random selections of pages from the texts in two grades, IV and VII. The results show that on the average only 19 per cent of the words in Grade VII are contained in the smaller list, and only 35 per cent are contained in the larger list. For Grade IV the corresponding figures are 57 per cent and 74 per cent. That is to say, about four fifths of the words of Grade VII and two fifths of the words of Grade IV are not found in the list of 3324 words common to two or more of the six investigations; about two thirds of the words of Grade VII and one fourth of the words of Grade IV are not found even once in the 6250 words of the six different investigations.

It is a significant fact, also, that spellers show little agreement among themselves in the words that they contain. In addition to Miss Arnold's results reported below, we have the statement of Cook and O'Shea ¹ that of a total of 12,489 different words used in three spellers

¹ Cook and O'Shea, *The Child and His Spelling*, 1914, page 226.

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only 1613, or less than 13 per cent, were common to all the spellers.

The need for discrimination in choosing texts. The purpose of the author is not to discredit all the spellers in common use, but rather to suggest the need for careful discrimination in choosing texts, and to give a standard of values which may be applied in the criticism of textbooks and courses of study. In spite of the poor selection of words, almost any speller will show some point of excellence. However, the desire to emphasize some one principle, such as the phonic relationship of words or the contextual presentation of words, should not lead to the exclusion or subordination of other important factors. The need of the day is a good, well-balanced, practical speller.

THE NUMBER OF WORDS TO BE TAUGHT

Another inheritance from the past which still causes a great waste of time and energy is the practice of teaching an extremely large number of words. It is not difficult to find in current use spelling books containing six, eight, ten, and even fifteen thousand words. In order to meet the requirements of these voluminous texts it is found necessary to make the daily assignments correspondingly large, so that ten to twenty words are commonly given in a lesson. Facts now well substantiated fail to support this practice.

The number of different words used in writing. There is not a great variety of words in the writing vocabularies of children and adults. Ayres² found that about nine words recur so frequently as to constitute one fourth of the whole number of words written, while

² Ayres, L. P., *A Measuring Scale for Ability in Spelling*, 1915, page 8.

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about fifty words with their repetitions constitute one half of all the words we write. Jones³ places the average writing vocabulary of the eighth-grade child at about 2500 words. Another investigator states that the average number of words used by the high school graduate is not more than 4000.

The number of words to be taught. Thus it appears that a writing vocabulary of 4000 or 5000 words is adequate for the most exacting and varied demands that are likely to be made upon the average child, and that the thorough teaching of 3000 to 3500 carefully selected words is about all that should be expected of the elementary school; provided, that in addition the child is taught how and when to use the dictionary. With a smaller vocabulary to be taught the number of words per lesson may be reduced.

THE GRADING OF WORDS

The grading of words is a matter that is usually taken out of the hands of the teacher by the makers of textbooks and courses of study. Nevertheless, because of the direct bearing which the proper grading of words has upon the success of her own work, it is well for the teacher to consider the defects of the present practice and the more important facts and principles that point toward the probable solution of the problem.

Assignment of words to grades. In common practice there is little agreement among textbook makers concerning the grades to which words belong. They disagree so widely as to put the same words in grades three to five years apart. Miss Arnold, who made a comparative study by grades of the entire vocabularies of five

³ Jones, W. F., *Concrete Investigation of the Material of English Spelling*, 1914, pages 26-27.

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of the leading spellers of the day, found "that not more than 19 per cent of the words in any one grade were common to more than two spellers, and that this percentage ranged between 11 per cent and 19 per cent."

Lack of principles of grading. Second, so far as can be discovered, no rational or scientific principles have been followed in the placing of words in grades. Apparently personal opinion and custom have largely controlled the matter. It would not be surprising if further investigation should show that as great mistakes have been made here as in the selection of words.

The positive suggestions that can be offered as having a basis in experimental data must be tentative and few in number. More conclusive statements must await the further investigation and study of the words used by children, grade by grade.

Decisive factors in grading. We are probably agreed that the use of the word is the most important factor in determining the grade in which it should be taught. The child should learn to spell words at approximately the time that he is going to use them. The question of the difficulty of the word as a principle of grading is secondary to that of use. Naturally, a word should not be placed in a grade when it presents little or no difficulty. In general, a word should be placed in the grade where it is used and where it needs to be taught.

Jones's investigation. Jones⁴ is the only investigator who has made a detailed report of a concrete study of the words used by children in the several grades. He found the total number of different words in the writing vocabularies, grade by grade, and the average number of words per pupil. The striking re-

⁴ Jones, W. F., *op. cit.*, pages 22-23.

sults of his study are the proportionately large number of different words used by second-grade children,— more than 1900 out of the 4500,— and the rapid growth of the pupils' vocabularies in the lower grades. The average number of words per pupil increased from 521 in Grade II to 908 in Grade III, to 1235 in Grade IV, to 1489 in Grade V, and to only 2135 in Grade VIII. When the total number of different words used in Grade II — 1900 — is compared with the average number of words per pupil in the same grade — 521 — it becomes clear that there is great variety in the vocabularies of children of the same grade and that it is practically impossible to teach all the words used by all the pupils. Just how frequently a word must be used before it is to be taught in a spelling exercise is largely a matter of individual judgment. Jones places in Grade II, 524 words used by 50 per cent of the pupils; in Grade III, 655 additional words used by 40 per cent of the pupils, etc. When he comes to Grade VII, he includes the words used by only 6 per cent of the pupils; and in Grade VIII, the words used by only 2 per cent of the pupils.

The study suggests that more emphasis might be placed upon spelling in the lower grades, where the children's writing vocabularies are increasing by leaps and bounds and where there is a relatively high degree of commonness among them, and that the formal work in spelling might take the form of independent study in the upper grades, where the commonness among children's vocabularies grows less and less and spelling becomes to a considerable extent an individual problem.

Peculiarities of word behavior, a factor. A complete and final solution of the problem of the grading of words must also take into consideration individual and type

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peculiarities of word behavior. Dr. Buckingham⁵ suggests three types of words for special consideration: (1) Words that need not be taught at all. These were excluded in our original selection. (2) Words that appear easy in the lower grades and hard in the upper. Such words, he suggests, may have been taught prematurely in the lower grades. (3) Words that possess special difficulties for the middle grades, such as *whose* when the apostrophe is taught.

THE GROUPING OF WORDS

Can the mere grouping of words on the page or on the blackboard be made to increase the ease and readiness of learning the spelling of the words? What is the best method of arranging words in groups? These are the problems of this section.

Natural relationships between words. Perhaps some of us have had the experience of being bothered by the spelling of a particular word until all at once the difficulty was removed by the discovery of a similarity between the spelling of the troublesome word and that of a simpler word already known to us. Thus it has been found that *separate* loses some of its difficulty if associated with *parade*, and that *piece* is not difficult if associated with *niece*. In a few cases even stronger associations may be made, such as *hear* with *ear* and *eat* with *meat*. In each case the inherent difficulty of the word is not affected. The mental lift comes from the association of two words having a common point of difficulty, one of which is known or has no confusing connections.

Mistake in promiscuous grouping. The promiscu-

⁵ Buckingham, B. R., *Spelling Ability: Its Measurement and Distribution*, 1913, page 112.

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ous or chance order of grouping words not only fails to take advantage of these natural relationships between words, but also makes possible the formation of accidental relationships in time and space which are a positive hindrance to learning. Arps⁶ gives experimental evidence for the latter part of this statement and suggests that words be learned independent of associates, unless such other associates form permanent and meaningful connections.

The discovery by observation and experiment of the value of association in the learning of words suggests that larger use should be made of this principle in teaching than is made at the present time, and leads us to a consideration of the best methods of grouping words for pedagogical purposes.

COMMON PRINCIPLES OF GROUPING WORDS

A very brief study of the common textbooks in spelling will show that little attention is paid to the grouping of words outside of certain classes of nouns. A few texts that attempt to classify words usually follow either one or both, or some modification, of two general principles: (1) grouping according to associated meaning or use, and (2) grouping according to common structure and phonetic elements.

Grouping by associated meaning or use. Outside of a possible increase of interest in the work, grouping words according to associated meaning or use has little pedagogical value. The relationship between the meaning and the spelling of words is very remote. To group words by it disregards the important means of associa-

⁶ Arps, G. F., "Attitude as a Determinant in Spelling Efficiency in Immediate and Delayed Recall." *Journal of Educational Psychology*, VI, 1915, pages 409-418.

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tion by sound and form. Furthermore, such grouping makes possible the formation of the accidental relationships which Arps found to interfere with the permanent learning of words. However, the advantages of this method may be secured by combining it with other methods of grouping, wherever possible. And words, principally nouns, that cannot be grouped in any other way may well be grouped according to their meaning or use.

Grouping by common structure and phonetic elements. Grouping by common structure and phonetic elements is the best type of grouping that has been evolved in common practice. It has the value of emphasizing the positive and vital relationships between words; that is, of forming close associations between similarities of sound and form. Thus the bonds between *piece* and *niece*, *separate* and *parade*, are those of form and sound. Such similarities of large phonogrammic units should be emphasized wherever possible, especially the association of a hard word with an easier word or a better-known word.

The value of this method of grouping in detail should not conceal its serious limitations as a general principle. These are: (1) It does not apply necessarily to words having minor phonetic likenesses, such as sound of letters or similar prefixes and suffixes. Prefixes and suffixes are usually phonetic in character and recur so often as to present little spelling difficulty. While there is, no doubt, a distinct advantage in calling attention to these common elements of words, the bonds of association are scarcely strong enough to justify grouping words upon this basis. (2) It is dangerous to apply to classes of words having similarities of sound only, such as *new*, *gnu*, *knew*. (3) It keeps separate many

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words that might well be grouped together in learning. To illustrate, *neither* goes with *either*; but *ceiling* and *deceive*, which have identical points of difficulty — the *ei* sounded as *e* — would be excluded from the group according to our principle of grouping. (4) The words to which it applies effectively, although important, are limited in number.

The lack of adjustment to pedagogical uses, characteristic of this method of grouping words according to their common structure and phonetic elements, is traceable to its origin. It is based fundamentally upon linguistic, philological principles and depends for its usefulness upon the constancy of the relationships between the form and the sound of words, a constancy which, unfortunately, does not exist in our language to any considerable extent.

GROUPING WORDS ACCORDING TO A COMMON DIFFICULTY

What is needed, evidently, is a principle of grouping that is fundamentally pedagogical in character, that is, a principle based upon the economy and hygiene of learning, and broad enough to include all classes of words. The principle which seems to meet most of the conditions of this test is that of grouping words according to a common difficulty. This principle focuses attention upon the difficult parts of words, thereby making for economy of teaching; it develops effective bonds of association; and it applies to 90 per cent of the words that possess real spelling difficulty, and to a very large per cent of all the words that we use. The words grouped according to their common structure and phonetic elements come naturally under this head. So also do certain groups of words having common

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prefixes or suffixes, such as the confusing *ance* and *ence* groups.

Wagner's experiment. The experimental determination of the value of this plan of grouping was made by Dr. Wagner⁷ of the University of Pennsylvania, who compared the growth in ability of two sixth-grade classes. In one class the words were classified according to a common difficulty and special attention was called to the words of the group. In the other class the words were presented in a chance order. In ten learning lessons the class following the grouping method showed a greater gain, amounting to about 20 per cent, or 1.1 times the improvement of the ordinary class as calculated by the author. The conclusion is: Grouping words into lessons according to spelling difficulty is better than the ordinary plan of spelling lessons. It secures better daily lessons, better final results, and greater steadiness or constancy of correct spelling. Further investigations should be made to establish beyond question the value of this method of grouping.

Use by the teacher. The task of working out detailed classifications for any considerable number of words according to a common difficulty must be left to makers of textbooks. Nevertheless, the alert teacher will find many opportunities for using this principle in her daily work. They arise in almost every lesson. Two words of the lesson having similar difficulties may be associated in learning, or the hard word of the lesson may be connected with a word previously learned. Groups or families of words having common difficulties may be built up from day to day, such as the *ie*, *ei*, *ate*, *ait*, and *aight* groups. This work presupposes, of

⁷ Wagner, C. A., *Experimental Study of Grouping by Similarity as a Factor in the Teaching of Spelling*, 1912.

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course, some knowledge on the part of the teacher of the common types of errors. If the teacher does not already possess such information, she may learn much from a little systematic observation of the written work of children. The omission and the insertion of silent letters and the confusion of vowels will soon stand out as the chief kinds of errors. These two classes constitute three fourths of the errors that children make.

HOMONYMS

The "together" versus the "separate" method of presentation. The grouping of a particular class of words, homonyms, deserves special consideration. The time-honored dispute is whether words of this class are to be taught together or separately. Unfortunately, the experimental investigation of the problem leaves the decision still in doubt.

Pearson's investigation. Mr. Pearson's investigation,⁸ conducted under carefully controlled conditions at the Horace Mann School, showed a definite arithmetical superiority of the "together" method. These results were corroborated when the same experiment was performed under substantially the same conditions in the Montclair, New Jersey, public schools. Yet the proper interpretation of the results is held in question even by Mr. Pearson, who says that owing to the inequality in difficulty of the words it is impossible to say with confidence whether the together method is really superior to the separate method.

Confusion in common theory and practice. In common practice and in the general treatments of the peda-

⁸ Pearson, H. C., "The Scientific Study of the Teaching of Spelling." *Journal of Educational Psychology*, Vol. II, 1911, pages 241-252.

gogy involved, a somewhat similar confusion is observed. Some teachers and authors favor one method; some, the other method. However, the balance of opinion and practice seems to favor the separate method of grouping. This diversity of opinion and practice is doubtless traceable to a number of causes, but one fact seems to stand out from the rest. This is the common failure to discriminate between the use of the two methods for the original and the subsequent presentation of words. It is quite possible that the peculiar value of each method has been overlooked.

Jones's suggestion. In his now famous investigation Jones made the pertinent observation that homonyms do not usually appear in the child's writing vocabulary at the same time; that, in fact, they often appear years apart. If this is actually the case, then the separate presentation of words in the order in which they appear would seem to be the natural and simple method. Another bit of evidence pointing in the same direction is the common adult experience of a sudden awareness that two words of this class have lodged in the mind for some time without our consciousness of the fact and without any confusion in use.

The superior value of the separate method was established, according to Jones, by experiments in the teaching of homonyms in the University of South Dakota. Unfortunately, these experiments were not published, so that it is impossible to judge of their worth.

Conclusion. The best statement, in my opinion, that we can make at the present time is that as far as possible, in initial presentation, homonyms should be taught separately; but when they appear together, in the same grade, or when they have been confused by the pupil, they should be taught together.

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Our general principle of grouping, also, is applicable to the teaching of homonyms. Members of pairs should be associated where possible with other words having similarities of form and sound; e. g., *deer* with *cheer*; *dear* with *hear* and *tear*; *waste* with *haste*; and *piece* with *niece*.

The principles of teaching homonyms are largely the same as the principles of teaching other words, except that more emphasis must be placed upon the development of the meaning and the use of the words.

SUMMARY

1. The spelling lists with which tradition has provided us contain many words of infrequent use and unusual difficulty.

2. Economy of time and effort in teaching demands a vitalized spelling list, consisting of the words which occur commonly in the writing of children and adults.

3. A number of reliable investigations provide us with a minimum list of such words.

4. Spelling books frequently show a poor selection of words. Careful discrimination in choice of texts is necessary.

5. As shown by repeated investigation, the number of words to be taught need not be large,—3000 to 3500 words.

6. There is little agreement among authors of text-books on the theory and practice of grading words.

7. The most satisfactory rule seems to be, to place the word in the grade where it is used, and where it needs to be taught.

8. The chance grouping of words fails to take advantage of the natural relationships of words.

9. Grouping by associated meaning or use, and

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grouping by common structure and phonetic elements, emphasize relationships which are not essentially vital or which are limited in applicability.

10. Grouping according to a common difficulty is a principle which appears to meet our needs. It is fundamentally pedagogical in character, and broad enough to include all classes of words.

11. Experimental investigation still leaves in doubt the question of the best method of teaching homonyms.

12. Possibly each method has a peculiar value: the "separate" method, in initial presentation; and the "together" method, when words have been confused by the pupil.

CHAPTER TWO

PRELIMINARY TESTING FOR WORD DIFFICULTY

ASSIGNING *lessons versus teaching.* The conspicuous fault in the past teaching of spelling was the absence of any serious effort of the kind we are accustomed to associate with the teaching of other subjects. Spelling was not *taught* at all in the sense that other school subjects were taught. This was not for lack of time, for spelling received its due proportion of time and frequently more than its due proportion. But methods and devices for improving spelling efficiency received scant attention on the part of teachers. The type of teaching prevailing is familiar to all. It consisted primarily of the assignment of "the next ten words." Some of the more difficult words may have been pronounced and, possibly, defined; then the pupils were directed to "study your lesson." Parenthetically, we may notice that work of this sort presupposed greater skill on the part of the pupil in studying than the teacher showed in teaching. It has been recognized for a long time that there are right methods and wrong methods of teaching arithmetic, geography, history, and most of the other common school subjects, but a pedagogy of spelling is a recent acquisition.

This attitude toward spelling may be explained by the apparent simplicity of the subject. Spelling, more than any other subject, may be divided into units of supposedly uniform size and constituency and parceled out to pupils to be learned by their own undirected efforts. Again, to the casual observation of teachers, the appearance of words does not suggest enough difference in kind and degree of difficulty to show the need of

a variety of methods of presentation. But the teaching of no subject is simple. Recent scientific investigation shows that spelling, like handwriting, presents many confusing alternatives in the way of method, and that mere conjecture upon the subject will not lead us very far. Fortunately, these facts have been gradually coming home to teachers, and they are now making as serious a study of the teaching of spelling as they have made of the teaching of other subjects.

Steps in the teaching of words. In the process of teaching words, as carried on in the classroom, there are several distinguishable steps into which the work naturally falls. These steps roughly form the basis for the organization of the material of the succeeding chapters. They are: preliminary testing for word difficulty, presentation of words and class study, independent study by the pupil, or drill, testing, the correction of errors, and reviews.

The need for word study. The unsatisfactory results of much of our work in the teaching of spelling have been due to our ignorance of the material with which we deal. We have already seen that this is true in the selection and classification of words. In that connection we found it necessary to consider what words should be selected for teaching, in what grades they should be placed, the particular spelling difficulty of words, the grouping of words on the basis of their common difficulties, and the grouping of a particular class of words, homonyms. Ignorance of the material is equally a handicap in the teaching of words. We must determine the relative difficulty of words, the particular parts of words that present spelling difficulty, the words that should be kept apart and the words that should be placed together in teaching, the kinds and classes of

errors, the frequency with which different classes of words should be reviewed, and the value of words in marking. All of this means a more careful study and analysis of the words that we teach in spelling.

In concluding his thesis on *Spelling Ability: Its Measurement and Distribution* (1913, page 112), Dr. Buckingham says: "If this study does no more than show the need of word criticism and indicate a method, it may be worth while. Every school affords a place and every day a time at which something may be done to help throw light on the nature of the material we deal with in spelling."

Significance for the teacher of the unequal difficulty of words. One of the commonest consequences of the lack of careful word study is the failure to discriminate in teaching between words of unequal difficulty. To illustrate: if five words are to be taught in a period of 20 minutes, the teacher will spend approximately 4 minutes on each word, or she will have the children repeat or copy each word the same number of times. In marking, also, each word is given the same weight. It is true that some exceptions to the rule may be noticed, such as keeping individual and class word lists, and throwing out written work that contains one misspelled word from a given list of the most commonly misspelled words. These so-called best practices of the day are but incidental and detached illustrations of a principle as yet imperfectly recognized.

Evidence of the unequal difficulty of words. The fact of the unequal difficulty of words has been proved by Thorndike, Buckingham, and others. Professor Thorndike¹ shows that for six words taken from a fifth-

¹ See Buckingham, B. R., *Spelling Ability: Its Measurement and Distribution*, 1913, page 2.

grade test, errors were made as follows: *disappoint*, 37; *necessary*, 42; *changeable*, 42; *better*, 3; *because*, 1; *picture*, 0. Additional evidence may be obtained by any teacher who cares to take the trouble to give a test of such words as occur in the daily lessons and to set down the number of times each word is misspelled. A sample of what may be expected in such a test is given in Plan I, Appendix A. The words were selected from a well-known speller. The results, given in the second column, show that in a class of 44 pupils some words were missed only once, while others were missed as many as 22 and 36 times.

Use to be made of this knowledge. The fact of the unequal difficulty of words is no longer held in doubt. The only question that remains is, what use is to be made of this knowledge? Thorndike, Buckingham, Starch, and other investigators have been interested in the inequality of word difficulty for the purpose of establishing standard tests and scales with which to attain greater precision in the marking and measuring of the spelling efficiency of school children. These instruments have greatly facilitated the work of administration and supervision, but they have benefited the teacher only indirectly.

The knowledge of the unequal difficulty of words is quite as significant for the proper teaching of words as for the testing of pupils. Teaching which disregards differences amounting to 80 per cent in the spelling difficulty of words is bound to result in the waste of time and effort. Practically, it means that some words are overlearned, while the drill on others stops short of mastery. There is waste in either instance. In the latter case, the words poorly learned are quickly forgotten. A knowledge of the relative difficulty of the

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words of the lesson will enable the teacher so to distribute her time and energy that each word will receive its due proportion.

THE DETERMINATION OF THE DIFFICULTY OF WORDS IN DAILY PRACTICE

The present unreliability of teachers' judgments.
The next step is to get a practicable plan for determining the difficulty of words in daily practice. Up to this time two possible plans have appeared as the result of schoolroom experience and experimental study. The first one is to leave the matter to the judgment of the individual teacher. Bearing upon this attractively simple plan Dr. Buckingham² makes the pertinent remark: "Whatever may be the value of a consensus of many individuals, the trustworthiness of the judgment of a single teacher appears to be of almost no value." Again, he says: "The results of this study sufficiently indicate the present unreliability of individual judgments unless the list is very short and the judgments are very numerous." The results of my study of the judgments of some twenty-five teachers support the conclusions of Dr. Buckingham to a considerable degree. Therefore, it would seem that the untutored judgment of the individual teacher is too inaccurate and variable to be relied upon in this important matter.

The present use of standard scores impracticable.
The other suggestion is to use standard scores and lists of words grouped according to their degrees of difficulty. For example, five words taken from column "L" of the Ayres scale might be subjected to the same amount of drill on the assumption that they are, as it is claimed, of equal difficulty. Apart from theoretical

² Buckingham, B. R., *op. cit.*, pages 70, 75.

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objections to using word lists graded according to difficulty rather than according to frequency of use, there are several important practical difficulties. In the first place, comparatively few of the words of any particular course of study have been standardized; and, in the second place, while such standardized scores may be accurate as an average of a large number of classes, they probably fall far short of representing the real difficulty of the words for any particular class. We have found this to be the case with words taken from the Ayres scale.

A suggested plan. Any plan for determining word difficulty must be accurate and practicable. That is, it must be workable; it must be objective, based upon actual spelling of children; and it must fit the conditions and needs of a particular class.

Such a plan has been used in the author's school for two years, and in several other schools to his knowledge. A typical weekly lesson plan for Grade VI is given in Appendix A, Plan I. It provides for a preliminary test of the words for a week on the Friday preceding the week in which the words are to be taught. The words are dictated to the children; then spelled back to the children for correction; finally, the teacher determines the number of errors for each word by a show of hands and enters the figure after each word on her record sheet. Thus her work for the week is laid out. By comparison with the "number present," the figures give some notion of the degree of difficulty of the several words and show the teacher the relative emphasis that should be laid on each word. After each day's lesson a similar test is given and the figures are entered in the appropriate column. If the teaching is thorough, there should be few errors or none in the

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daily test. If the teaching has been well proportioned, the words will have about the same number of mistakes. When a word is found to have too many errors, it is carried over into the next day's lesson and treated as before. The plan provides also for a review lesson of all the words of the week on Friday, with a record of errors; and finally, a test without study after two weeks. The last is to get some evidence on the timing of reviews and may be varied as necessity demands. The use of this plan shows the teacher how to distribute her time and effort among the words of the lesson and gives her effective and repeated checks upon the efficiency of her work. Teachers who have used the plan find that they take no more time for spelling than before,— 15 to 20 minutes per day. The plan is suggested here for what it is worth as one that has been tried and used with some degree of success in actual classroom work. There is a possible source of weakness in the nearness of the preliminary test to the presentation of the words. This may be remedied by giving more words at a time in the preliminary test and by lengthening the interval between the two steps.

INTERPRETING PERCENTILE DIFFERENCES IN TERMS OF AMOUNT OF DIFFERENCE

Actual differences in the difficulty of words. One thing yet remains to give the teacher the power to distribute her time effectively among the words of the lesson; namely, an interpretation of the differences in percentages of incorrect spelling in terms of differences of amount, expressed by the *number of times* one word is harder than another. For example, how many times harder is a word misspelled by 98 per cent of a class than a word misspelled by only 2 per cent? If the

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first word is 10 times harder than the second, then it should receive 10 times the effort in teaching. The opinion of teachers, which in this matter can amount to little more than a guess, is far from the real fact. The average estimate of several groups of teachers was that a word misspelled by 98 per cent of the pupils is about 20 times as hard as a word misspelled by only 2 per cent. Some individual estimates were as high as 28 per cent. The fact is that the true difference in difficulty between a word which all the class can spell and a word which practically no one of the class can spell is not more than 5 times. It ranges between 5 times in Grade III and 2 times in Grade VIII. This difference, while small as compared with estimates of teachers, is nevertheless large enough to affect appreciably the teaching of the words.

TABLE I

RATIOS OF WORD DIFFICULTY BASED UPON PERCENTAGES OF INCORRECT SPELLING

Per cent incorrect	Number of P. C.	Ratios					
		III	IV	V	VI	VII	VIII
100-97	4	10	10	10	10	10	10
96-89	8	9	9	9	9	9	9
88-73	16	8	8	8	8	9	9
72-51	22	7	7	7	8	8	8
50-29	22	6	6	7	7	7	7
28-13	16	5	5	6	6	6	7
12- 5	8	4	4	5	5	6	6
4- 1	4	2	4	4	5	5	5

The Use of Table I. Ratios of word difficulty for Grades III to VIII are given in Table I. The figures represent the proportionate amount of time and effort that words of the several degrees of difficulty should re-

ceive. For example, in the third grade, if a word spelled incorrectly by 100-97 per cent of the pupils is repeated 10 times, then a word misspelled by 96-89 per cent of the pupils should be repeated 9 times; a word misspelled by 88-73 per cent of the pupils, 8 times, etc. The teacher who will fix the ratios for her grade in mind will have a rough yardstick by which the relative difficulty of the words in the day's lesson may readily be measured and her time and effort apportioned accordingly.

The statement in percentages, in the first column of the table, of the distribution of words incorrectly spelled need not cause trouble. They can be converted into actual number of mistakes for any class by dividing each percentage in turn by the part, approximately taken, that the number of the pupils in the class is of 100. Thus, for a class of 48 pupils, divide by 2; the groups under "Per cent incorrect" become 50-48, 48-44, 44-36, etc., actual number of words misspelled.

Justification of intensive work in determining the difficulty of words. This intensive work in determining the relative difficulty of words and in distributing time and effort in spelling upon the basis thereof is made possible by a better selection of words, by the teaching of a smaller number of words, and by a more effective use of the time given to spelling. Formerly, each recurring storm of popular criticism of the ineffectiveness of the public school in preparing children for the demands of ordinary business and college life was met by increasing the amount of time devoted to spelling, until it was discovered that, as spelling was then taught, the amount of time spent made little or no difference in the quality of the spelling product. Denied this dubious expedient for increasing the spelling efficiency of our pupils, it

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would seem that our only recourse is to a more intensive development of the resources at hand, involving a refinement of our methods of selecting and teaching words.

SUMMARY

1. *Testing* spelling has given way to the *teaching* of spelling.

2. Improvement in method depends primarily upon a more systematic word study.

3. Inequality in the difficulty of words is abundantly proved by observation and experiment.

4. The relative difficulty of the words of the lesson is the basis for distributing time and effort.

5. For determining word difficulty the judgment of individual teachers is too inaccurate and too variable to be relied upon.

6. The use of lists of standardized words is unsatisfactory.

7. The only practicable way of obtaining reliable information is the use of a preliminary test.

8. Average word difficulties expressed in per cent may be converted into figures showing the *number of times* one word is harder than another by the use of Table I.

CHAPTER THREE

THE PSYCHOLOGICAL BASIS OF SPELLING

THE ultimate aim in the teaching of spelling is to give the individual such control over the ordering of letters in words that the expression of thought in writing may go on freely and accurately, without attention to mechanical details. In short, it is the automatic control of the means of written expression. This is the standard by which the teacher selects and judges her methods of teaching; it is the goal to which she directs her efforts. An analysis and description of the mental processes involved in this intimate relation between thought and the written word, and a description of the steps by which it is reached, is the task of the psychology of spelling.

MENTAL IMAGERY

Visual and auditory images. Our knowledge of word forms, like all other knowledge, comes to use through the senses. We do not taste or smell words, and people in possession of their full powers do not come to know words through the sense of touch; but we do see and hear words. All word forms that pass into the mind must take one of these routes, the eye or the ear. So entering, they form pictures in the mind and as such are retained.

Motor images. Word pictures are not all of the visual and auditory sort. Words are spoken and written as well as seen and heard. The former as well as the latter form distinct impressions on the mind, which we call mental images. Unlike merely hearing and seeing a word, the oral or written spelling of it brings into

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play definite sets of muscles. In oral spelling the muscles of the throat are at work; in written spelling, the muscles of the hand and arm. It is claimed that in the writing process at least 150 muscles are involved. These muscular movements are recorded in the brain, forming the basis for *motor images* of words. These motor images are explained thus: the oral or written spelling of a word involves a definite and specific series of adjustments of the muscles of the throat or hand; the same series of movements is called into play every time the word is spelled, so that by repeated use a particular series of movements comes to be associated with a particular word; just as no two words look alike to the eye or sound alike to the ear, so no two words feel alike to the throat or hand; that is to say, each word comes to be associated with a certain distinct kinesthetic image of the arm or throat in making a particular series of movements, thus attaining a motor individuality of its own.

The part that motor images play in learning spelling is a significant one. When the series of movements for each word has become completely established through frequent use, as in the writing of common words, we no longer need to think of individual letters as we did in the original learning. † One nervous impulse is sufficient for the whole word. The thought of the word or of wanting to spell the word sets the machinery in motion and the word, as we say, spells itself. It is through the service of motor images that spelling is finally made automatic. Motor imagery aids also in forming clearer visual and auditory images, in the way that expression strengthens impression. In writing, the eye, by following the point of the pen, gets a detailed and accurate impression of the word each time the

word is repeated. Finally, motor images serve as additional bonds of association in the learning of words.

Mental images of spelling words should not be confused with mental images of words involved in hearing, speaking, and reading. The processes of hearing, speaking, and reading words involve mental images of a different sort from those used in spelling. They are images of whole words, while the imagery immediately involved in the spelling of words is the imagery of the order of letters. (The peculiar task of spelling is to associate with pictures of whole words, which are already a part of the child's experience, detailed images of the order of letters.)

Preferred kinds of imagery. In learning the spelling of words it is possible to employ several kinds of word pictures. From our previous discussion it is clear that such pictures must include the eye or the ear on the one hand, and the throat or the hand on the other. With the eye may be associated movements of hand, throat, or both hand and throat. The same is true of the ear. Also, the eye and ear together may be associated with movements of hand, throat, or hand and throat. While, theoretically at least, there are nine possibilities in the combination of word images, certain combinations are preferred to others. In general the eye is preferred to the ear, and the throat and hand, while of no practical value for independent use, are a direct and positive aid to either eye or ear.

Individual differences in imagery. While this is true, speaking generally, the preferred type of imagery is yet more or less an individual matter. Common observation shows that there are some persons to whom the natural method of verifying the spelling of a word is to spell it orally to themselves; others must see the word

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before them; while still others must write the word. That is, people naturally employ different kinds of imagery in doing the same kind of mental work. At least three types stand out; namely, visual, auditory, and motor. Of the last, two types are distinguishable, speech-motor and hand-motor. The practical implication of this fact is that methods of teaching do not have the same value for all children. They vary for different individuals according as they are favorable or unfavorable to the dominant type of learning. The best method of presentation is a matter of getting for each person the right combination of the processes that may enter.

ORDER OF MENTAL PROCESSES IN LEARNING SPELLING

The exact mental processes employed in spelling have been made the subject of experimentation by trained observers. As nearly as they have been determined, these processes appear to be as follows:¹ Preliminary to the spelling exercise, ideas have been associated with auditory, visual, and speech-motor images of whole words. The first step in spelling is to get a clear, accurate mental picture of the whole word in visual, auditory, and speech-motor form. These are already closely associated in the mind, so strong is the connection between the perception and the oral expression of words. For example, it is said that in silent reading, instead of the idea being associated directly with the written symbol, the written symbol calls up the speech-motor image of the word and the latter calls up the idea. In the second step the word is broken up into syllables. With the clear visual imagery of the syllables.

¹ See Hollingworth, Leta S., *The Psychology of Special Disability in Spelling*, pages 79-80.

ble, it is usually pronounced. With the visual and speech-motor-auditory image of the syllable is associated a visual image of the letters in order. The visual image of the order of letters is associated with the throat movements necessary to spell the word orally, and the hand movements necessary to write the word.

Individual variations. From our knowledge of mental types, we do not expect these processes to be the same for all pupils. For example, a pupil leaning strongly toward ear-mindedness might associate the letters of a syllable directly with the sound of the syllable, without having the accompanying visual image.

Ordinary adult observers may fail to discover each of the steps in their own conscious experience. As learning approaches the stage of habituation, the tendency is for the written form to become more and more directly connected with the idea, due to the dropping out of some of the intermediate steps. The mental processes involved are best shown in the recall of a forgotten word or in the learning of a new word. Even here they are somewhat obscured by the intervention of familiar parts of words, such as common phonograms.

Importance of the syllable. Another fact needs to be emphasized. A great many words, nearly all polysyllabic words, contain too many separate letters to be taken in by the eye at one glance, as is necessary for a detailed and accurate mental picture. The perception span is from three to five distinct objects. Therefore, the syllable is important in learning, since it at once divides the word into a number of perceivable units and at the same time makes possible a clear, definite, detailed picture of the letters.

SPELLING AS HABIT FORMATION

Spelling, as we have seen, involves the association of mental images of words. Learning of this kind, which has in it less of thought, variety of content, and originality, and more of the repetition of certain set forms or movements, is learning of the habit-formation type. It consists primarily of the association of certain arbitrary symbols, and then of practice in making these symbols until they can be made automatically, or "without thinking" about them. The emphasis in learning is upon exercise and effect. The principles for the formation of habit are vivid picturing, attentive repetition, and automatic control. These principles represent also the steps or stages of learning.

Vivid picturing. The ease of habit formation depends in the first place upon the strength of the mental push with which the child is started. Vivid word pictures, like vivid experiences of an unusual and thrilling nature, such as an automobile accident, make lasting impressions on the mind. The strength of the impression, as in other phases of learning, depends largely upon the child's interest. Therefore ways and means of adding interest and enthusiasm to the work are an important consideration for the teacher. To add vividness, the word under investigation may be made to stand out from other words by letting it assert its individuality. We do this by picking out the common elements of the word, by pointing out its peculiar difficulties, by associating it with other words of similar form, and by a variety of other devices that will appear in succeeding pages. Further, the strength of the image will be increased by appealing to the pupil's dominant type of word imagery. If a child is visual-minded, then visual

presentation is better for him; if ear-minded, then auditory presentation will have the most lasting effect. Since visual learners are in the majority, visual presentation should be the basic method. Lastly, variety of presentation is equally important. There is no such condition as pure ear-mindedness or pure eye-mindedness. A child may be more strongly inclined toward one mode of imaging than another, but all modes are present to some degree. Therefore all methods of presentation will be effective to some extent. The effect of variety will be a multiplicity of appeal which we recognize as an important principle in learning. Moreover, a variety of methods of presentation is necessary to provide for the children who belong to the exceptional imaginal types, the ear-minded and the motor-minded individuals.

Attentive repetition. There is a period of learning between the first clear picturing of the word and the use of the word freely in expressing thought when the child must focus his attention and effort definitely upon fixing the image of the word in mind. This is the beginning of the drill or practice stage in learning. In order to be effective this first drill work must be accompanied by a high degree of attention. Otherwise, not only will there be little improvement, as is shown by studies of the curve of learning by Book, Bryan and Harter, and others, but also through carelessness mistakes will be made, the correction of which will require the expenditure of additional time and energy. A good example of what a drill should not be is seen in the old "assigning lessons" method of teaching. Frequently the child, in a spirit of any-way-to-get-through-with-it, wrote the word the prescribed number of times, with increasing illegibility if not inaccuracy. The formal demands of

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the teacher were scrupulously complied with, but the result was an increasingly distorted if not actually erroneous mental picture of the word. It is not mechanical repetition, but repetition with attention, that facilitates the process of habit formation.

As in case of the original presentation of words, attention is to a considerable extent a condition of the child's interest in the work, and time spent in making spelling significant and attractive to children in the long run will be time well spent. Equally important is the active direction of the beginning drill work by the teacher. Only thus may the teacher be sure of the active attention of the children. This work is often closely associated with the presentation of the word and is a regular part of class study. The drill should be short, spirited, varied.

Value of trial recall. In this phase of the work the child not only is shown the word or told how to spell it, but also is allowed to spell it by himself. Active recall is better than additional presentation from without. This is a helpful way of securing close attention and forms the connection in the way in which it will be used. Such recall, also, shows the child when he does not know a word and allows him to distribute his time among the different words of the lesson according as they are easy or difficult.

Automatic control. There is no abrupt break between attentive repetition and automatic control. With repetition and use there is a gradually decreasing amount of attention, and consequently more and more automaticity. The mind is increasingly freed from the necessity of directing the ordering of letters and is left free to follow the thought. But for most persons perfection of skill is never realized in spelling even the com-

monest words. [The more we become absorbed in thought and composition, the less sure we are of the spelling of words; rather, the surer we are of incorrect spellings. Few of us would want a first draft turned over to the printer. Yet for practical purposes we may regard a word as learned when it is used freely and with a high degree of accuracy in ordinary composition, such as letter writing; and, when attention is especially directed to spelling, as in going over a sheet a second time, misspellings are readily detected and corrected.

The power of automatic or habitual spelling of words is developed by frequent repetitions of words in special drills or as they occur in ordinary composition. It is not a power which is fully developed in the school or which ends with the school. It increases with use throughout life.

SUMMARY

1. The control over written word forms is attained through the medium of mental images.

2. The more common kinds of images are: visual, auditory, speech-motor, and hand-motor.

3. In general the eye impression is stronger than the ear impression, and combinations of the throat and hand with the eye or the ear are distinctly preferable to either eye or ear, alone.

4. Individuals vary considerably both in the particular kinds and the particular combinations of images natural to them.

5. There are four "types" of learners, corresponding to the four modes of imagery.

6. The processes involved in learning spelling include: the association of the heard, spoken, and seen forms of the word with the meaning of the word; the

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visualization of the word by syllables; the association of the visual images of the syllables with the sounds of the syllables; association of the visual image of the order of letters with the visual and the speech-motor-auditory images of the syllables; and association of the speech-motor and hand-motor images of the order of letters with the visual image of the order of letters.

7. The psychological principles involved in learning are vivid picturing, attentive repetition, and automatic control.

CHAPTER FOUR

THE PRESENTATION OF WORDS

GENERAL PRINCIPLES SUGGESTED BY PSYCHOLOGY

THE only value in a discussion of the psychology of spelling is in the practical suggestions that may be offered for the formulation of a method of teaching. A practical method of teaching is our goal. Let us now see how far toward this goal our discussion has taken us.

Psychological principles of presentation. We have found as general principles that visual presentation is superior to auditory presentation and that the effectiveness of either is increased by oral and written spelling. The successive steps of presentation appear to be: the close association of the visual, auditory, and speech-motor forms of the whole word with the meaning of the word; the visual and auditory presentation of the word in syllables; the pronunciation of the word by syllables with a clear visual analysis of the letters of the syllables; the written and oral spelling of the word.¹ Individual differences in types of learning demand a varying emphasis upon the learning exercises. Finally, the outstanding principles of learning spelling are the clear, vivid picturing of the word in whole and in part, the attentive repetition of the word, and the frequent use of the word in drill and practice until it is spelled automatically.

The pedagogy of spelling more than a statement of psychological principles. The contribution of psychology is important in the formulation of a method of

¹ In this connection see Hollingworth, Leta S., *The Psychology of Special Disability in Spelling*, 1918, pages 79-80.

teaching spelling, but obviously many of the questions that the practical teacher will ask are left unanswered. Some of these are: What is the best form of visual presentation? How may visual and auditory methods be effectively combined? What is a practical plan for the oral repetition of words? What combinations of visual, auditory, and motor elements give satisfactory results? Shall syllables or letters be vocalized? Shall words be presented in columns or in sentences? Which is better, individual or class study? These questions, and many more that might be formulated, show that the pedagogy of spelling is much more than a statement of psychological principles. In fact, the psychology of spelling provides us with principles for general guidance only in selecting methods of teaching. The greater task, as well as the more practical task, is to work out the detailed applications of these principles to actual schoolroom work.

THE SELECTION OF EXERCISES AND METHODS

The experimental method of investigation. In former times we have had to rely entirely upon the classroom teacher for working out and testing applications of pedagogical principles and methods of teaching. The practice led to serious consequences due to the comparatively limited experience of any one person, the difficulty of tracing cause and effect in complex schoolroom situations, and the insecurity of generalizing upon the basis of individual observations. More recently a way of evaluating classroom methods has been devised which retains the intimacy of the teacher's contact with practical teaching and yet yields results of scientific value. This method is illustrated in Mr. Pearson's study of homonyms reported above. In

brief, it consists of the comparative study of two methods or devices of teaching under actual schoolroom conditions, in which all factors except the one under study are carefully neutralized. To illustrate, if the problem is the determination of the relative value of class and independent study by comparing the growth in spelling efficiency of two classes in a given period of time, then extreme care is taken to select groups of children of the same spelling ability and training, to get word lists of equal difficulty, to keep the amount and distribution of time the same for each class, etc. If all these factors have been carefully balanced, then any difference in results will be due to a real difference in the value of the methods of teaching. It is obvious that to be of any significance experiments of this kind must be performed accurately and according to accepted principles of scientific investigation, and that results must be interpreted in the light of these facts. When results are obtained and interpreted in this manner, they have the utmost significance for teaching. The selection of exercises and methods ceases to be entirely a matter of personal opinion and takes on in a measure the characteristics of a scientific procedure.

By the use of this method of investigation, many important contributions have been made to the pedagogy of spelling in recent years. The work of this chapter is to report the results of these studies, together with other important but less reliable material bearing upon the practical exercises and methods of presenting words.

PRONUNCIATION, MEANING, AND USE

Lessening emphasis upon pronunciation, meaning, and use in modern teaching. The pronunciation, mean-

ing, and use of words are more properly taught in connection with other phases of language work, but custom has prescribed that such work should constitute an important part of the teaching of spelling. While there is an element of wisdom in this provision, we clearly need a reassessment of values. The old practice of spending one half to two thirds of the time in spelling in laboriously working out, with dictionary in hand, the pronunciation, meaning, and use of words was a natural consequence of the teaching of large numbers of strange, technical, and unusual words. The new content of spelling renders this extreme emphasis unnecessary. By selection the words that we teach are the words with which the child is familiar in his oral and written composition. Thus, in general, the teacher's task becomes not so much the development of the pronunciation, meaning, and use of words as the correction of mistakes and the broadening of the child's knowledge of words.

Importance and significance of pronunciation. This change in the character and amount of the work required of the teacher, with the changed content of spelling, should not deceive us as to the importance and significance of pronunciation in learning the spelling of words. The first step in learning to spell a new word is to divide it into syllables. We pronounce each syllable and then the word as a whole. A little observation will show that we are almost irresistibly impelled to this order. When in doubt about the spelling of a word, most persons pronounce the word slowly by syllables and try to visualize the order of letters in each syllable. Pronunciation may be combined with writing, also. Again, it is said that the success of the learning exercise and of the recall of the word depends upon the close-

ness of the association between the sound of the syllables and the visual image of the letters.

Practical suggestions for the teacher. The practical suggestions for the teacher that should be drawn from this somewhat abstract discussion are quite obvious. First, careful pronunciation should always precede the spelling of the word. The first pronunciation in the spelling exercise should be slow and distinct, emphasizing the syllables of the word but not destroying the unity of the auditory image. A good practice is for the teacher to dictate the original pronunciation, with the word written in syllables on the board. The children repeat after her, at the same time making a careful visual analysis of each syllable as it is pronounced. After some knowledge of words has been gained, several repetitions of this exercise will suffice for the learning of certain words. Learning in this case will consist of the recognition of common or phonetic groups of letters, as the common phonograms *pro* and *gram* in *program*. When the entire word is not mastered in this exercise, it will often result in the learning of common parts of words and in fixing attention upon uncommon or unphonetic parts. Second, clear and accurate enunciation should always be insisted upon. Children tend to spell as they speak, and they bring to the spelling class many habitual and careless inaccuracies of speech which greatly increase the difficulties of the spelling teacher. A little concentrated drill in connection with this or some other phase of language work, preferably the latter, directed against the common mispronunciations that occur in children's speech, will add greatly to the ease of teaching spelling.

Value of indicating the pronunciation of words by syllabification and diacritical marking. The value of

indicating the pronunciation of words by syllabification and diacritical marking has been definitely determined. It would seem from the evidence available that its value is variable, depending upon the mental type of the individual learner. For the visual-minded it is a distinct hindrance, but for the auditory-minded it is an equally distinct advantage. The difficulty for the visual learners is probably explained by the interference of the unnatural markings with the clear, vivid picturing of the word. As is found in reading, also, a word diacritically marked presents an entirely different appearance from the word unmarked; the child may recognize the one and not the other. The gain of indicating the pronunciation of words to children when the words are unfamiliar and difficult and when the learners are of the auditory type, may be greater than the loss due to impairing the appearance of the word, but these conditions do not obtain in the schoolroom. The words are common, everyday words and a large majority of the learners are of the visual type. Therefore it would seem inadvisable and unnecessary to use the diacritical marking method. The same arguments may not hold against the limited use of a few simple marks that do not materially affect the appearance of the word, such as the long and short marking of vowels, if these markings prove to be necessary.

The value and use of phonics. The study of phonics directly aids the learning of spelling by giving a knowledge of the sound value of letters; by developing clear articulation and accurate enunciation; by correcting inaccuracies of speech; by strengthening the association between the common speech sounds and their literal equivalents; and by calling attention to the common elements of words. A discussion of the extent to which

phonics should be taught in order to accomplish these results, or of when the teaching of phonics should be begun and how it should be conducted, may well be waived here as irrelevant. The results are likely to be realized whatever method is pursued, and should be considered a by-product, not the chief end, in teaching phonics.

A common mistake in the spelling exercise is to carry the phonetic analysis of words too far. As pointed out above, the syllable, not the letter, should be the unit in vocalization. It may sometimes be advisable to have certain children sound individual letters, but not usually.

Meaning and use. Spelling has no significance apart from the use of words in sentences. Any drill upon special word lists is bound to be more or less isolated and artificial. This consideration has led some teachers and textbook makers to go to the extreme of presenting words to children only by dictation in sentences or in connected passages. While appreciating the point made, it would seem that substantially the same results can be accomplished without adopting these extreme measures. By selection we have a list of words with which the child comes into frequent contact. By calling attention to the recurrence of these words in written compositions, by making lists of the words frequently misspelled in written work, by requiring the use of words in sentences, and by a variety of other exercises, the teacher will be able to keep the purpose and significance of spelling clearly before the children as well as provide for the use of words in their natural setting.

Obviously, it is unreasonable to require a child to learn the spelling of a word with the meaning of which he is not familiar. The probability is that the children

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will know the meaning of words selected as described in Chapter One and that they will be able to use the words readily in sentences. The extent to which meaning and use should be taught is dependent upon the needs of the particular class. To be on the safe side and to keep the relation of spelling to composition clearly before the class, the teacher should have all the words defined or, preferably, used in sentences. For the most common words the backward members of the class may be called upon. The more unusual words and words with a variety of meanings should receive whatever treatment the particular needs of the class may require.

The teacher cannot be sure of the mental image which a particular word will call to the mind of the child, nor can she always anticipate the sense in which a common word will be used. The safest plan is to let children make their own sentences, and to correct or expand the definition and use of words as the need arises.

Definitions. The definition is a device for testing or clarifying the pupil's knowledge of a word. It is frequently difficult for pupils to give and is not so vital as the use of the word in a sentence. Nevertheless, it may be used to add variety and interest to the work.

The logical definition of words involves a high degree of abstract thinking and should not be expected of children in the lower grades. The child himself may guide us in the matter. It has been found that the rational method of defining words for children in the fourth grade is by colloquial definitions; in the fifth grade the use of synonyms becomes prominent; and in the sixth grade logical definitions are in the majority, although definitions of the other kinds are still common.

Relation between knowledge of meaning and correct spelling. The important relation between a knowledge

of the meaning of the word and the correct spelling of the word is pointed out by Hollingworth² in the following paragraph: "On the basis of these data we conclude that knowledge of meaning is probably in and of itself an important determinant of error in spelling; that children will produce about 66 $\frac{2}{3}$ per cent more of misspellings in writing words the meaning of which they are ignorant or uncertain, than they will produce in writing words the meaning of which they know." Whether or not ignorance of the meaning of words is a *cause* of misspelling, or whether knowledge of meaning and correct spelling simply *occur together*, possibly as the result of common causes, the experiment does not make clear. At any rate, a relationship between the two is evident, and no one is likely to question the importance of increasing the child's familiarity with the meaning and use of words as a condition to correct spelling.

Training in use of dictionary. The knowledge of how to use the dictionary is essential to the development of independent power in acquiring the pronunciation, meaning, use, and spelling of words. If this is not provided for in other phases of language work, it must be made a part of the work in spelling. The teacher will do well to follow the suggestions of Professor Suzzallo:³ "First, the alphabet is reviewed to see if it is well within the child's easy habitual command. Then the child is sent to the dictionary to find simple words the spelling of which he knows. At first these words have different initials, to establish the simple principles of alphabetic order. Later, words beginning with the same initials

² Hollingworth, Leta S., *The Psychology of Special Disability in Spelling*, 1918, page 57.

³ Suzzallo, Henry, *The Teaching of Spelling*, 1911, pages 93-94.

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are assigned, to show that the initial letter alone does not determine the place of a word in an alphabetical list. Thus the principles of alphabetical and sub-alphabetical arrangements are mastered. And last, words, the spellings of which are doubtful to the child, are given; and the child is taught to scan the pages till he finds them. Special exercises are given to show a child how the pronunciation (*lesser, lessor; least, lest*) or meaning will assist him to find the word when the spelling is in doubt (*capitol, capital; limpit, limpid*). Special exercises are given to show the child how to determine which is the preferred spelling when there are two.

“Exercises in finding pronunciation are given in the same careful way until each technique is taught,—preferred pronunciation, the interpretation of diacritical marks through the key words at the bottom of the page, the meaning of the accents, etc. Then the child is drilled until he can readily determine the meaning of a word. The abbreviations for the parts of speech are explained. He is encouraged to read all the meanings, avoiding those marked ‘rare,’ ‘colloquial,’ or ‘obsolete,’ and to select the most likely meaning with the aid of the examples of usage.”

“SEEING” AND “HEARING”

“*Seeing*” superior to “*hearing*.” The superiority of “seeing” to “hearing” in the teaching of spelling as shown in the discussion of psychological principles appears also in actual classroom studies of the problem. In fact, the truth of this hypothesis was first demonstrated in the experimental-pedagogical studies. Dr. Lay⁴ in 1895 found that reading words from the board

⁴Lay, W. A., *Fürher durch den Rechtschreibunterricht ge-*

was superior to the dictation of the spelling of words by the teacher, when in each case the children kept tightly closed jaws to prevent or limit movements of speech organs. The reading method proved to be two or three times better than the dictation method. These results were abundantly substantiated by succeeding students of the problem. Thus a controversy lasting from the time of Pestalozzi was laid to rest, and teachers now generally accept the superiority of "seeing" to "hearing" as a valid principle of teaching.

"SEEING"

"*Seeing*," or *visual presentation*. "Seeing" in the general terms of everyday pedagogy means any form of presentation in which appeal is made mainly to the eye. It includes the perception and picturing of words, syllables, and letters. The aim in presentation is to develop clear, vivid, accurate mental images.

Steps in visual presentation. "Seeing" is more than looking at a word. It involves an active attitude — a visual analysis of the word into its parts, a recognition of familiar and of unfamiliar parts, a comparison of these with similar parts of other words, and finally weighing and emphasizing the difficult parts. A more detailed discussion, with illustrations of these principles, follows.

Recalling and vivifying the child's mental picture of the whole word. For recalling and making vivid the child's mental picture of the whole word some teachers begin by having the spelling lesson on the board before the children during the day. The incidental reading of

gründet auf psychologische Versuche und angeschlossen an seine Entwicklungs-geschichte und eine Kritik des ersten Sach und Sprachunterrichts. Wiesbaden, 1899.

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such lists no doubt has value in familiarizing the pupil with the word forms. At the beginning of the spelling period the list is erased, for reasons that will appear below. Each word is then taken up individually and is written out by the teacher in syllables, before the class. The syllables are only slightly spaced, so as not to impair the image of the whole word. In the writing process, the child sees not only the word form but the making of the word form. This, it is thought, facilitates learning by virtue of the motor imagery suggested by seeing performed the muscular movements involved in writing the word.

Words to be presented singly unless grouped according to a logical, psychological principle. The question as to whether words should be presented to children singly or together was investigated by Dr. Abbott⁵ and, indirectly at least, by Arps.⁶ The conclusions of the two investigators harmonize perfectly, although they approached the subject from different angles. They conclude that for permanent learning the presentation of words one at a time is better, although for immediate reproduction simultaneous presentation in a fixed order proves more effective. The explanation of these facts offered by Arps is, that words promiscuously grouped on the page or board form incidental relationships due to proximity of position, or closeness of repetition in time; that these relationships aid the immediate learning and recall of words; that they quickly lose their potency when the immediate situation in which the

⁵ Abbott, E. E., "On the Analysis of Memory Consciousness in Orthography." *Psychological Monographs*, Vol. X, No. 1, University of Illinois.

⁶ Arps, G. F., "Attitude as a Determinant in Spelling Efficiency in Immediate and Delayed Recall." *Journal of Educational Psychology*, Vol. VI, 1915, pages 400-418.

words were learned fades away. Teachers find by experience that children memorize words in a certain order and that they spell the words more readily in this order than in any other. The fact of the loss in the delayed recall of the words is not so obvious, but it is none the less real, as shown by experiments.

The argument against promiscuous grouping will not hold against grouping according to a logical — that is, psychological — principle. Unless such groupings are possible it is better to present words singly, or in case of simultaneous presentation frequently to change the order of words in presentation, drill, and test.

The question of "transfer." The value of presenting words in columns when words are naturally used in composition only, is a question frequently raised by teachers. There are several aspects to the problem, but in essence it is this: To what extent does efficiency gained in column presentation carry over into contextual use?

Contradictory conclusions of Cornman, Wallin, and Cook and O'Shea. The conclusions of the experimental investigations of the problem vary from one extreme to the other. Cornman⁷ concluded that there is little if any transfer from column to sentence use of words. Wallin⁸ contradicted this and said that the loss in transfer is not over two words in a hundred. Cook and O'Shea⁹ agreed with Wallin in finding a slight loss. It amounted to 5 per cent.

Results of investigation by the author and Miss Brown. The investigation by the author and Miss

⁷ Cornman, O. P., *Spelling in the Elementary School*, 1902.

⁸ Wallin, J. E. W., *Spelling Efficiency in Relation to Age, Grade and Sex, and the Question of Transfer*, 1911.

⁹ Cook and O'Shea, "Column versus Contextual Spelling." *The Child and His Spelling*, 1914, Chapter V.

Brown¹⁰ leads to the belief that all these investigators to some extent missed the mark. Cornman's conclusions were not supported by careful and precise measurements. Wallin and Cook and O'Shea failed to take into consideration the extent of the children's knowledge of the words before the teaching began. They lumped all the words already known to the children in with the words actually learned as a result of the specific column drill, which of course makes the loss as compared with the number of correct spellings very small. When Miss Brown and I did the same thing, we found that the loss in transfer is only 4 per cent. On the other hand, when we began by subtracting from the number of correct spellings in the column and dictation tests the number of words spelled correctly before teaching, and then made our comparison, we found that the loss in transfer is 11 per cent.

The loss in transfer a real one. This loss in transfer is a real one, neither so large as to justify the statement that there is little if any transfer, nor so small as to be negligible. The practical question for the teacher is, what use is to be made of this fact? In the first place, it is not a question of "column presentation" *versus* some other kind of presentation. No one has ever found a satisfactory substitute for a good form of spelling drill. It is pure folly to say that spelling can be taught without taking words out of sentences and giving them individual attention. At the same time some provision should be made in the plan for teaching which will insure greater skill in the use of words in sentences. Just what this provision should be is more or

¹⁰ Tidyman, W. F., and Brown, Helen A., "The Extent and Meaning of the Loss in Transfer in Spelling." *Elementary School Journal*, Vol. XVIII, No. 3, 1917, pages 210-214.

less a matter of individual opinion. I believe it is mainly a problem for individual study and review, and so discontinue the discussion until those topics are reached.

An instance of another kind of loss in "transfer" was found by Mead¹¹ in his investigation of the extent to which college students "use the accurate spelling vocabulary of their themes in English in themes in sociology." He found a decided tendency to lower the standard of efficiency in spelling in the sociology themes, and suggests the need for higher standards for written work in subjects other than English as a means of increasing students' spelling efficiency.

Picking out the familiar, unfamiliar, and difficult parts of words. Picking out the familiar, unfamiliar, and difficult parts of words is an exercise that gives interest and variety to the detailed study of the word. It also makes possible the isolation and concentration of attention, successively, upon the several parts of the word, comparison with familiar combinations of letters, and concentration of effort upon the unusual or difficult portions, all of which makes for clearness of perception and ease and economy of learning. Thus, with the word clearly before them on the board the pupils are asked to find: words in words, such as *connect-i-cut*, in *Connecticut*; common phonograms or elements, such as *other* in *mother, another*; common prefixes and suffixes, such as *pro, epi, inter, ness*; and stems, such as *bright* in *brightly, brighter, brightness*.

Emphasizing the unfamiliar part. The picking out of the unfamiliar portions of words is even more important than picking out the familiar portions. It has

¹¹ Mead, A. R., "Transfer of Spelling Vocabulary." *Journal of Educational Psychology*, Vol. VIII, 1917, pages 41-44.

a different purpose in teaching. Pointing out the familiar part is for the purpose of dismissing it with a mental note of recognition, while determining the unfamiliar part is for the purpose of stressing just that part in learning. For example, in *intercede*, the *inter* is at once recognized by an upper-grade pupil and requires only passing notice, while a great deal of emphasis should be laid upon *cede*.

Variation in difficulty of the parts of words. Similarly, locating the difficult part of the word is an important part of the work of teacher and pupils. This is not a superhuman task for the teacher to perform, although much help can be given by a more careful and systematic experimental study of the kinds and frequencies of errors that children make. For the present, the teacher will have to rely largely upon her experience, common sense, and observation of children's written work. One teacher who to my knowledge obtained excellent results in spelling had a systematic plan for checking up the particular mistakes made by her children in the preliminary tests. It will be found that children repeat certain errors over and over again,¹² and that certain words are subject to peculiar pitfalls. A common illustration is the first *a* in *separate*. The difficulty of this word represents a large class of difficulties; namely, the confusion of vowels having obscure or equivalent sounds. One fifth of the errors that children make are due to this cause. As a source of errors it is exceeded in extent and viciousness only by the silent letters. Over one half the mistakes in spelling are due to the omission or insertion of silent

¹² See Kallom, A. W., "Some Causes of Misspelling." *Journal of Educational Psychology*, Vol. VIII, 1917, Table I, pages 396-397.

letters. Together, these two classes of errors constitute three fourths of children's misspellings. Therefore any deviation from phonetic spelling and any place where vowels are likely to be confused because of obscure or equivalent sounds should receive the special attention of teacher and pupil.

Order of syllables as a factor. Another general principle of localizing word difficulties is suggested by Hollingworth.¹³ Of 102 errors occurring in the spelling of 11 polysyllabic words, 52 errors were made on the intermediate syllable, 19 on the initial syllable, and 31 on the ultimate. 27 dissyllabic words gave 60 errors on the ultimate and 37 on the initial syllable. Thus it is clear that the middle and ultimate syllables present the greatest difficulty for spelling. "The implication for pedagogy here seems to be that stress should be placed on intermediate and final syllables in the teaching of new words, as the initial element tends to take care of itself."

Emphasizing the difficult parts of words. Distribution of time and effort among parts of words according to their difficulty pervades all phases of the spelling work, but is especially important in visual presentation. Children readily learn to pick out the hard portions of words. The parts so distinguished should be underlined and discussed to show why they are difficult. Tracing the difficult part of the word in colored chalk or inclosing it in parentheses is a plan sometimes followed instead of underlining. In my opinion, underlining is the simplest and least confusing device that can be used for the purpose. It is effective and does not destroy or impair the appearance of the word.

¹³ Hollingworth, Leta S., *op. cit.*, page 42.

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Associating the difficult part of a word with the same difficulty in other words. The difficult part of the word is made to stand out more clearly by comparison and association with the same difficulty in other words. This point was emphasized in connection with our discussion of grouping. When words are not presented in groups distinguished by a common difficulty,—that is, when they are presented singly,—the same result may be obtained by recalling words having the same difficulty. As far as possible the pupils should be made responsible for this work. When the words are recalled, the common point of difficulty may be emphasized by calling attention to it verbally; or if more emphasis is desired, the words may be listed on the board for more careful comparison and inspection.

Additional principles of associating words. The comparison of word with word opens up a large field of devices by which the literal composition of the word may be vivified. The comparison of words having similar difficulties is but one phase of the work in which words having vital similarities or relationships are associated in learning. These include, in addition, the association of words having similar phonogrammic units, as *phonograph* and *telegraph*, *program* and *telegram*; words having similar form and meaning, including all root words and their modifications, such as *beauty*, *beautiful*, *beauteous*; words having similar changes in form to denote differences in meaning, such as *city* (*cities*) and *lady* (*ladies*).

Observation and comparison of words, a concrete basis for word study. These comparisons of word with word form a concrete basis for a large part of word study frequently associated with spelling. A compar-

ative study of words of the first two classes brings out certain common elements of words, such as stems, prefixes, suffixes, and the more frequent modification of words in respect to the formation of adjective and adverbial forms, number, tense, and the like. This provides the material and the method of approach for most of the word building that need be carried on in the school. In these exercises our primary interest is in developing control over the ordering of letters in words rather than in the development of meanings. By emphasizing the common elements of words, the pupil recognizes their familiar forms as they recur in different connections and need give little thought to their spelling. In taking up a new word, such as *womanly*, it is a simple matter to refer to the already familiar *woman* and the type modification *ly*. After the root form has been learned, the common modifications should present little difficulty and require little extra time in spelling. Opportunities will arise frequently in taking up a new word to call attention to the root and its common modification so that not one but several words are learned.

Teaching derived forms necessary. Parenthetically, we may notice that the teaching of derived forms is a necessary part of spelling instruction. Mr. Ballou¹⁴ showed in an extensive investigation of this problem in the Boston Public Schools that children find the spelling of derived forms, even simple plurals and simple verbs in *ing*, e. g., *singing*, considerably more difficult than the root forms which have been studied previously; and the derived forms present *new* spelling difficulties.

Finally, the comparison of words having similar

¹⁴ Boston Public Schools, *The Teaching of Spelling*. School Document No. 17, 1916, pages 14-19.

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changes in form provides a wealth of detailed instances for the formulation of such rules of spelling as are found necessary and useful in learning.

Immediate recall, an important factor in learning. One other fact about visual presentation needs to be emphasized; namely, the importance of immediate recall in learning. After the word has been shown and the visual appearance of the word emphasized in the manner described above, it is well to allow the child time to change perception into mental imagery at once, while it is fresh and vivid. The pupils are told to shut their eyes, put their heads on their arms, or turn around, and try to visualize the word — see the word as it appeared on the board. Such devices take but an instant and are an important contribution to the learning exercises.

“ HEARING ”

Certain phases of the importance of the auditory element in learning spelling were pointed out in connection with the pronunciation of words and syllables. Because of the close association of thinking with hearing and speaking, and the fundamental knowledge of word sounds which the child brings to school with him, the pronunciation of words and syllables is an important factor in spelling. But “hearing” in this connection means something entirely different. It is the dictation of the order of letters in words.

Mental processes involved in hearing a word spelled. It has been found that when the spelling of words is dictated, visual imagery is invariably substituted at once for heard letters and heard letters are never recalled in terms of auditory imagery. It would seem, then, that dictation is simply a roundabout way of

calling up the visual image of the word in the child's mind, a result that might be accomplished more directly and effectively by visual presentation.

Dictation of little value as a separate spelling exercise. As a separate exercise in spelling dictation has little value. Lay found that it was only one half or one third as effective as visual presentation, and only one sixth as effective as copying.

Such value as it has is largely due to that group of exceptional children who employ auditory imagery to a considerable extent in the learning and recall of words. There are a few children who recall words directly through the auditory image of the letter, and a few others who employ the auditory image of letters as associated with the visual image of the letters. The latter process is connected primarily with the recall of phonetically spelled words. For words not phonetically spelled dictation has even less value.

With phonetically spelled words dictation has its greatest usefulness. There is a definite and consistent relation between the sound of the word and the order of letters. The attention of the children may be called to such words, and the teacher may employ devices to introduce the auditory element. For example, in writing the word on the board for presentation she may spell the word as she writes.

Value of hearing a word spelled incidentally realized in oral spelling. For the most part auditory presentation is taken care of in ordinary classroom procedure by association with other exercises and needs little separate treatment by the teacher. All vocalization provides an appeal to the ear, whether it is loud, as in oral spelling, or soft, in connection with copying. Loud oral spelling, which is one of the commonest schoolroom

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devices, makes an auditory appeal both to the pupil reciting and to the listeners.

MOVEMENTS OF HAND AND THROAT

Significance. In the visual and auditory presentation of words we have been concerned with impressing word forms on the mind from without. Movements of hand and throat, on the other hand, involve the written or verbal expression of word forms from within. Expression clarifies and deepens the mental image of the word, at the same time serving as a check upon the accuracy and vividness of the image. Writing has the peculiar advantage, also, of giving a new visual impression of the word each time the word is repeated. Even more significant for spelling are the new bonds of association formed through the medium of motor images. It is through these, as we have seen, that spelling knowledge is turned into skill.

Value. Movements of hand and throat, as stated in a previous connection, do not occur independently. They are always associated with visual or auditory presentation. The value of these is seen when they are compared with "seeing" and "hearing" alone. An average of the results of three important investigations shows that the addition of speech and writing movements to visual and auditory presentation decreases the number of errors approximately one third. The results of Dr. Lay alone would put the figure as high as two thirds.

The gain is clearly attributable to both forms of motor expression, although the writing movement has the larger share in the results. Over a third is due to the writing movement, while about one fourth is due to speech movement. Moreover, the gain of one fourth

cannot be assigned wholly to the movements of the organs of speech. The ear must share the responsibility, since the oral spelling of the experiments includes auditory as well as speech-motor elements.

Place of oral spelling as a spelling exercise. Oral spelling is an exercise that has the weight of tradition behind it. Until quite recent times it was practically the only method used in the teaching of spelling. Gradually now it is being supplemented by other methods. There is a possible danger that we shall go to the extreme of discountenancing it entirely. That would be as inexcusable as uncritically assigning it to its traditional place in teaching. It is obvious that to use oral spelling intelligently we need to know its relative value as a spelling exercise. This we have found to be second only to writing movements.

The objections to oral spelling are not its use so much as its overuse; and second, the fact that it is not the way that children need to spell in real life. These objections will be met by assigning to oral spelling its proper place as a spelling exercise. As a method of presentation, oral spelling means the formation of a new kind of word imagery, the speech-motor image combined with an auditory image of the word as one hears it spelled by himself. That is, to the visual and pure auditory images of the word is added a speech-motor form, a multiple appeal which illustrates an important and well-known principle in learning. The importance of the speech-motor-auditory method of presentation is shown not only by experiments, but as well by consideration of the closeness of the relation between speaking and thinking.

The use of oral spelling. The use of oral spelling is pretty generally understood by teachers, although some

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suggestions along this line may not be out of place. After developing the pronunciation and the visual phase of the presentation of the word, the teacher usually calls upon one of the pupils or the whole class to spell the word orally. The group method of reciting may be easily overdone and should be watched carefully. Its value lies in giving each pupil a chance to spell the word aloud, a thing that would be impossible with individual recitations only. The dangers are that children who have the greatest need for the work will not join in the exercise at all, or that they will follow a few leaders, repeating the letters mechanically after them; and second, that it is difficult for the teacher to watch clearness, accuracy, and precision of spelling, all of which are very important in the work of presentation. The alert, capable teacher will reduce these evils to a minimum by keeping group spelling from degenerating into a monotonous, indifferent mumbling; by calling upon the lazy and backward pupils for special recitations; etc.

For oral spelling the word may be presented to the children visually, on the board, or orally, by dictation. Both devices may be used for variety, but the former gives the better results.

Children may spell in a soft voice or a loud voice. In connection with "seeing" it was found to make little difference which one was used; when combined with "hearing," loud speaking was the more effective.

In addition to this audible spelling the children should be taught to spell in a whisper and to themselves. Thus, when copying a word from the board, the pupil may well spell the word to himself as he writes. The obvious advantage of these devices is that children may carry them on individually without disturbing other children and without following a lockstep order.

MOVEMENTS OF HAND

In comparatively recent times the use of written spelling in one form or another found its way into almost every classroom. Here its peculiar adaptability made it, even more than other devices, a tool of the "assignment" method of teaching. Later, when teachers came to realize the importance of the actual presentation of words, visual and oral spelling pressed forward, but written spelling remained in the background, the almost exclusive possession of the pupil's independent study period.

Writing as a part of presentation. The objection to this practice is not the use of written spelling for seat work; rather, the failure to use it as a part of presentation. Writing the word vivifies its visual imagery, but, of vastly more importance, it forms the connection between the visual or auditory or speech-motor image of the word and its hand-motor image, the connection which is to make spelling automatic and which will be used throughout life. The better teaching of the day goes little beyond the vivid visual and auditory presentation of words. It is quite as important that the hand-motor connection be formed definitely and accurately as that the child should get a clear sense picture of the word. To accomplish this the association should be formed under the expert direction of the teacher and not left to the hit-and-miss efforts of children.

Use of writing in presentation. The hand-motor element in learning begins with the writing of the word on the board by the teacher. To see a thing done is second only to doing it oneself. It appears again after the visual, auditory-speech-motor study of the word in

which clear mental images of the word as it appears to the eye, sounds to the ear, and feels to the speech-motor organs in oral spelling, have been formed, to tie these up with the hand-motor image of the word.

Copying. The work of the hand may take the form either of actual writing or of merely going through the movements of writing. Probably the best exercise is for the children to write the word with the written form on the board before them. For this work the children should have a sheet of paper at hand. One side of the sheet that is to be used in the seat work will do very well. Accuracy is the primary consideration, and with the word before them as a model and a check there should be no mistakes. The word may be copied several times. Lay found that this exercise was two and one half times as valuable as mere "seeing." Similarly, the word may be spelled orally to the children, to be written down as before. This exercise, while not as profitable as copying from the board, shows considerable gains over mere dictation. A number of modifications of these two fundamental types of written work may be devised. For example, a pupil may be sent to the board to write the word before the class or the child may spell to himself as he writes.

Writing movements. Writing movements may be substituted for the actual writing process. Two forms are distinguishable; namely, writing in the air and imaginary writing with the finger or dull end of the lead pencil or pen. These may be used with the written word on the board or with dictation. It is a question whether there is any considerable value to writing in the air. One investigator finds that writing in the air is over twice as effective as "seeing" or "hearing" alone. Another equally expert investigator claims that this ex-

ercise is a failure. The experimental evidence, therefore, is against any extensive use of it at the present time.

Although the matter has not been studied experimentally, the imaginary writing with finger or pencil is more promising. It more nearly approaches the real writing movement and, therefore, is more accurate and requires closer visual analysis of the word. Tracing written words is a similar device suitable to the lowest grades.

COMBINATIONS OF ORTHOGRAPHIC EXERCISES

In the preceding sections we have treated the several orthographic exercises separately. Even more important for practical teaching is the combining of exercises to form a complete method of presentation. Teachers nowadays do not rely upon a single exercise for impressing a word vividly upon the mind of the child. It is common knowledge that a combination of exercises is better than any one exercise. Our particular problem is to find what combination or combinations give the best results.

In several experiments combined methods of teaching have been compared and evaluated. These have a direct and important bearing upon our problem. Therefore I shall describe here in some detail the methods of presentation that have given the best results in these studies.

Copying and oral spelling. Haggenmüller and Fuchs¹⁵ found that a combination of copying and oral spelling was better than any other combination of exercises studied. Also, it made little difference whether

¹⁵ Schiller, H. H., Haggenmüller, A., and Fuchs, H., *Studien und Versuche über die Erlernung der Orthographie*. Berlin, 1898.

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the oral spelling was loud or soft. There was a slight advantage for loud spelling.

Meaning, seeing the word written on the board, reading, spelling, and writing movement. Marique's¹⁶ best method was this: The teacher explained the meaning of the word, then pronounced each syllable separately and wrote it on the blackboard. The pupils read each syllable separately and then spelled it once more while tracing it on their desks with the forefinger. The method second in value was as follows: The meaning was first explained by the teacher, then each letter was pronounced separately by him, and the words were finally repeated in the same way by the students all together. The first method raised the class average to nearly twice that of the second method, and nearly three times that of any other method investigated.

"Seeing," "hearing," and oral spelling. Winch¹⁷ compared a combined "seeing," "hearing," and oral method with a "seeing" method in which the children studied the words silently from the board. The combined method showed a considerable gain on the other. The author described it as follows: "The words of Set A were shown on a blackboard and the head master, a man much experienced in experimental work, spelt each word carefully, with slight pauses between the syllables, though these were pronounced, and a clear, distinct pronunciation of each word after spelling. Then the boys, simultaneously, word by word, after the experimenter, spelt each word twice, in an audible voice, looking at each letter as they named it. This took nine

¹⁶ Marique, P. J., *An Experimental Investigation in French Orthography*. Thesis, New York University, 1911. Unpublished.

¹⁷ Winch, W. H., "Experimental Researches in Learning to Spell." *Journal of Educational Psychology*, Vol. IV, 1913, pages 525-537.

minutes. The remaining minutes were given to a second spelling of the words near the middle of the list."

Visualization, meaning, use, writing, and oral spelling. Fulton's¹⁸ method of teaching spelling included the following steps:

1. Teacher writes word once upon the board.
2. Teacher explains meaning of the word.
3. Children use the word in a sentence.
4. The children write word ten times, and while writing say each letter aloud.
5. Teacher emphasizes by intonation of voice or by colored chalk on blackboard the difficult parts of the word.

Visual presentation, pronunciation, oral spelling, and writing. In a later investigation Winch¹⁹ found that a "direct" method of teaching spelling was superior to an "indirect" method which included writing the word on the blackboard, comments as pointing out difficulties and giving meanings, use in oral sentences, and dictation in oral sentences. The "direct" method included: visual presentation from the board, pronunciation of the word by the teacher, pronunciation and oral spelling by the pupils, and writing the word on paper.

Meaning, use, oral spelling, visualization, and writing. Pearson's²⁰ best method of presenting words, as described by himself, was as follows:

¹⁸ Fulton, M. J., "On Experiments in Teaching Spelling." *Pedagogical Seminary*, Vol. XXI, No. 2, 1914, pages 287-299.

¹⁹ Winch, W. H., "Further Experimental Research on Learning to Spell." *Journal of Educational Psychology*, Vol. IV, 1913, pages 579-592.

²⁰ Pearson, H. C., "Experimental Studies in the Teaching of Spelling." *Teachers College Record*, Vol. XIII, No. 1, Part II, 1912, page 53.

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1. The first word was written on the board in the presence of the class, and then studied as follows:
 - (a) Its meaning was given, and it was used in a sentence.
 - (b) It was spelled aloud in concert, and individually by the poor spellers.
 - (c) Its peculiarities, such as silent letters, *ei* and *ie* combinations, etc., were pointed out.
 - (d) The word was written once, twice, or three times by pupils, who spelled it silently as they wrote.
2. Each word in turn was written on the board and studied in the same way.
3. Next, the whole column was reviewed orally, the children first spelling each word from the board and then turning from the board, spelling again (either silently or aloud).

Summary. These experiments with methods of teaching have much in common. They give conclusive evidence to the statement that combined methods are superior to any single method of presenting words. Moreover, they show in a general way what combination gives the best results. Of the seven "best" methods, all include some form of visual presentation and oral spelling; all but one include writing the word; meaning or use is mentioned three times, pronunciation twice, and dictation once. That is, some form of visual presentation, oral spelling, and writing are found in practically every investigation.

A GENERAL METHOD OF PRESENTING WORDS

In this comparative study of the "best" methods we have found the particular combination of orthographic

exercises upon which there is considerable agreement among investigators. We have determined the function, value, and use of each type of presentation exercise. Finally, we have found out something about the order in which spelling exercises should be given. With this information and with our knowledge of actual schoolroom conditions, we should be able to construct a general method of presenting words of considerable reliability.

Essentials of a method of presentation. The essentials of such a method of presentation seem to be as follows: First, the attention of the children is called to the whole word on the board or in the book. The word is pronounced by the teacher and, if quite unusual or unfamiliar, by the children. The word is used in a sentence or defined. The teacher writes the word on the board in syllables. The children pronounce the word slowly and distinctly by syllables, with a clear visualization of the letters of each syllable. The attention of the children is fixed upon the familiar, unfamiliar, common, or difficult parts of words by picking out and underlining these parts, and by comparing and associating them with similar parts of other words. The children are told to look away from the word and try to see it as it looks on the board. The word is spelled orally by individuals, or by the class under controlled conditions. In either case, oral spelling is preceded by a clear and accurate pronunciation of the word. Finally, the word is written several times.

USE OF THE METHOD OF PRESENTATION

Adaptation necessary. Slavish obedience to this program is not necessary. It is offered as giving the essentials of a spelling method, the order in which the

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several exercises should occur, and, roughly, the relative emphasis that each exercise should receive. It is highly desirable not only that each teacher work out her own plan of teaching spelling, but also that the plan be made elastic enough to fit all sorts of varying conditions.

The essential things to be accomplished in any presentation of spelling words are: the recall or development of the heard, spoken, and written symbols of the word, together with its meaning and use; the clear, accurate pronunciation and visualization of the word by syllables; an accurate auditory-speech-motor image of the word; and a definite hand-motor image.

Variation in details of procedure for different words. It is obvious that to realize these purposes, the details of procedure must vary for different words. Words with which the child is familiar need receive little emphasis in respect to the development of meaning, pronunciation, and use, while unfamiliar and unusual words should receive much emphasis in these particulars. In the study of monosyllables, the second step is greatly shortened and simplified. On the other hand, visualization is very important in dealing with phonetic monstrosities, such as *scissors*. With phonetic words the auditory-speech-motor element is worthy of greater emphasis. These detailed adjustments are very important for the successful use of the method and should be definitely provided for in the teacher's preparation of the daily lesson.

Differences in pupils. Likewise modifications and adaptations are desirable to meet differences in pupils. The kinds of definitions that may be expected of children vary from grade to grade. Very young children cannot be expected to use words in sentences. The auditory element must receive greater emphasis with children in the lower grades. In the upper grades the

hand-motor element is increasingly important. The games and devices of the lower grades would be wholly inappropriate to the upper grades. Differences of nationality make different problems for the spelling teacher. Finally, individual differences in types of imagery should be taken into account. If the teacher is fortunate enough to have discovered children's preferences in ways of learning, she can employ this knowledge to good advantage, for example, by calling upon a motor-minded child for special work in written and oral spelling.

Provision for variety. Another important consideration in the use of this general method of presentation is the provision for variety. Every teacher knows that heroic efforts are necessary to avoid dead monotony in the spelling recitation. Variety may be achieved without omitting any of the essential steps of presentation and without materially changing the order of procedure. This is possible by varying the devices. The teacher usually has knowledge of a large assortment of devices, some of which she is in the habit of using from time to time. These can be readily evaluated and the better ones assigned to their proper places in the development of the lesson. Three or four devices for each step will provide sufficient variety for all practical purposes.

Combination of the steps. A number of results may be accomplished by combining several of the steps into one. For example, oral spelling may be combined with writing — the children spell to themselves as they write. Second, trial recall may be combined with oral spelling or writing. The child is told to picture the word before he spells or writes it. Third, visualization and writing may be combined in copying. Thus variety of presen-

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tation is added, the number of steps is reduced, and some time is saved.

The teacher in working out her own plan for teaching spelling may find useful the plans used by other teachers. A number of these will be found in Appendix A. All have been developed in actual classroom work.

Use of the method in independent study. The use of this method of presentation should gradually give the pupil the power to carry on his work independently. This is an important result not only for the immediate prosecution of his school work, but also for continued growth in spelling efficiency in later life. As children acquire the principles of word study, and the power to use these principles independently, teachers should see that children have the opportunity to exercise this power. Just how soon this work may be entirely turned over to children cannot be stated dogmatically. It will vary, certainly, with the capacity and the degree of development of children. It is not unreasonable to expect properly trained sixth-grade pupils to perform practically all these exercises independently. Certain exercises may be placed in grades below the sixth.

Teachers who favor a great deal of emphasis upon individualized instruction will find this method a useful tool. Children may be taught to select for study the words of the lesson which they do not know how to spell, to discover their particular errors and the particular causes of misspelling, to emphasize the difficult parts of words, to select suitable exercises, to test their own knowledge of words, etc. By such a method children are not compelled to study words which they know how to spell already, and may spend their time upon words taken from a supplementary list or upon another sub-

ject. However, no child should be excused from the review tests.

VALUE AND USE OF RULES

The more important and pressing problems involved in the presentation of words have been disposed of in the preceding pages of this book. Before dismissing the subject, however, two or three other matters should be considered. The first of these is the value and use of rules.

Decreasing reliance upon rules, a result of classroom experience. Observers of the trend of spelling methods in the last few years notice a decreasing reliance upon rules for the teaching of spelling. This may be due in part to a knowledge of the results of experimental study, but I think that for the most part it is an independent movement. Teachers, apparently as a result of ordinary classroom experience, are coming to believe that rules do not play a large part in producing spelling efficiency.

A result of experimental study. The results of experimental study point in the same direction. A comparative study of the more common rules of spelling (*ie-ei, final e, final y, final consonant, final ie*) led the investigators Cook and O'Shea²¹ to say, "Not a single rule tested proved to be of real value, except the one for the last two words of the list — that relating to the 'final *ie*.'" In another study, by Turner,²² of the value of rules in comparison with a drill method, the conclusion seemed to be favorable to the drill method.

The failure of the attempts to teach spelling by rules

²¹ Cook and O'Shea, "Rules for Spelling." *Op. cit.*, Chapter II.

²² Turner, E. A., "Rules vs. Drill in Teaching Spelling." *Journal of Educational Psychology*, Vol. III, 1912, pages 460-461.

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is probably due to the difficulty of trying to make systematic an unsystematic orthography. Children in the main learn spelling by seeing, hearing, and feeling words directly, rather than by a process of reasoning.

However, there is not enough evidence against the use of rules to warrant our discarding them entirely. A few of the more common and useful rules may rightfully have a place in the upper grades. What these rules are is largely a matter of opinion.

Formation of rules based upon a comparative study of words. The formation of rules should be based upon a comparative study of words. In observing the similar changes which words undergo in the formation of plurals, derivatives, and the like, the child may be led to see or may even discover for himself the principles of spelling involved. Thus, generalizations — that is, rules — appear as a natural outcome of the intelligent observation of words, rather than as arbitrary statements.

The child should be taught the uses of rules as means of correcting errors, aiding the memory, and acquiring the spelling of new words. We should bear in mind, however, that spelling by rule does not take the place of a free, automatic use of words.

CLASS *versus* INDEPENDENT STUDY

Another feature of the method of presenting words, which needs merely to be pointed out by way of emphasis, is the prominence given to class study. Class study is contrasted with independent study where children are told merely to “study your lesson.”

The class study plan. In the class study plan especial care is taken that children form accurate initial images of words, that no form of appeal is omitted or

neglected, that the proper emphasis is given to each phase of presentation, that the images are accurate and vivid, that the steps of presentation occur in the best psychological order, that those connections are formed which will be most useful in life, that pupils of unusual mental types receive some individual attention, etc. In all of this, importance is attached to making a clear, vivid impression of the correct form of the word, the formation of right habits, and the prevention rather than the correction of errors. In this plan, also, the teacher takes an active part, controlling and directing each step of the process.

Superiority of class study plan shown in experiments. The prominent place assigned to class study is justified by the results obtained in its use. Mr. Pearson²³ made a series of studies of the relative value of the class and independent study plans, in which the conditions were often unfavorable to the former. The third experiment showed most strikingly the superiority of the class study plan. In this experiment the class study method (a) eliminated from 36 per cent to 100 per cent more errors than the independent method, and (b) showed a greater relative gain in average improvement of from 47.6 per cent to 195 per cent. The author says, "The evidence of this experiment, therefore, from whatever angle we study it shows that teaching of the class study type is far more effective than the independent type." The whole investigation gives valuable evidence of the superiority of the class study method.

Following a similar line of inquiry Fulton²⁴ reached similar conclusions. The results for immediate learn-

²³ Pearson, H. C., *op. cit.*

²⁴ Fulton, M. J., "On Experiments in Teaching Spelling." *Pedagogical Seminary*, Vol. XXI, No. 2, 1914, pages 287-289.

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ing as well as for retention showed the superiority of the drill method.

SUMMARY

1. Psychology provides important principles of presentation, but not detailed exercises and methods.

2. The latter are obtained through experience and experimental investigations conducted under actual schoolroom conditions.

3. The new content of spelling renders necessary a new emphasis upon pronunciation, meaning, and use.

4. The new demand is for less emphasis upon developing *new* language habits, and for more emphasis upon correcting old habits.

5. Pronunciation plays an important part in the learning process. Therefore, accurate pronunciation should always be required and habitual and careless inaccuracies of speech should receive careful attention.

6. Syllabification is an important aid to learning, but the use of diacritical marks is negative in effect.

7. The use of words in sentences is important as emphasizing the practical utility of spelling and as giving the child opportunities for practice.

8. Definitions have less direct value and should be used sparingly.

9. If necessary, special exercises should be provided for definite training in the use of the dictionary.

10. In general, visual presentation is superior to mere auditory presentation.

11. The important exercises in visual presentation are: writing the words singly or in logical groups on the board before the children; picking out the familiar, unfamiliar, and difficult parts of words; emphasizing

the unfamiliar and difficult parts; and associating these parts with similar parts of other words.

12. The loss in "transfer" is a decided one, but the problem is mainly one of reviews.

13. For identifying the hard parts of words teachers, at present, must rely upon certain general principles, a few detailed studies of the errors common to particular words, and their own observations.

14. "Hearing" or the dictation of the order of letters has little value as a separate exercise. The value of the auditory element is realized incidentally in oral spelling.

15. Oral spelling and writing are valuable exercises as providing new modes of imaging, means of expression, and connections essential to the free use of words in writing.

16. Comparative investigations of combined methods of presentation show that some form of visual presentation, oral spelling, and writing are found in practically every "best" method.

17. In view of this whole study it would seem that the essential things to be accomplished in any method of presentation are: the recall or development of the heard, spoken, and written symbols of the word, and the connection of these symbols with the meaning of the word; the clear, accurate pronunciation and visualization of the word by syllables; an accurate auditory-speech-motor image of the order of letters; and a definite hand-motor image of the order of letters.

18. Any general method of presentation must be adapted to difference in words and in pupils.

19. The final test of the method of presentation is the ability of the pupils to employ it successfully in independent study.

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20. The value of the use of rules seems to be limited to a few very common rules.

21. Class study methods are superior to the independent study methods of untrained students.

CHAPTER FIVE

INDEPENDENT STUDY AND REVIEWS

IN the exercises of presentation vivid and accurate mental images of the word in its various aspects have been formed, and those connections have been made which will be most useful in life. The task of subsequent study is so to fix these word pictures in the mind as to secure their free and spontaneous recall and use in writing.

THE PLACE OF INDEPENDENT STUDY

The first step toward easy control and permanency of learning is taken in the independent study period. The conclusion of a lively and vigorous presentation exercise leaves the word fresh and vivid in the mind. To stop repetition at this point is to lose much of the advantage gained in the preceding work in the formation of strong, positive impressions of the words. Vivid impressions must be fixed and effectively tied up with motor expressions through immediate and frequent repetition if the learning of the word is to be made complete and adequate.

It is necessary that this work be carried on by the children independently. The acquisition of skill comes only through the exercise of a faculty. This is an individual matter. The teacher can stimulate, encourage, reward, and in a general way guide the child's efforts, but she cannot act for the child. Also, the practical demands of the schoolroom are such as to leave the teacher little time for the supervision and the detailed direction of the seat work of children.

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EXERCISES FOR USE IN INDEPENDENT STUDY

The exercises that may be used in the individual study period are limited primarily by the ends which are to be accomplished, and secondarily by the conditions of class work. Working conditions demand that the seat work in spelling be of such a character as not to interfere with the other schoolroom activities, while the purposes in view limit it to such exercises as will produce the particular skill which ordinary writing requires. These considerations signify, first, that words should be written, and second, that they should be written in sentences. The use of words in sentences should be the culmination of every study period, the final application and test of skill gained in isolated study. Further drill upon writing or copying words at the seat may be required where learning has not been brought to a stage of easy mastery in the preceding drill period, as in the case of hard or unusual words. If in doubt about the thoroughness with which an isolated word has been learned, err on the side of too much rather than too little drill. At best it will be found impossible to prevent some loss in transfer to contextual use.

ASSIGNMENT OF SEAT WORK

Such help as the teacher can give the children in their seat work must be in the form of directions in assigning the work for the day. Such assignments should be definite and specific. They should indicate for each word the number of times it is to be repeated or used in a sentence, and if necessary the particular parts or difficulties of the word that should be kept in mind by the pupil. Instead of saying merely, "Copy each word ten times," the teacher might say, "Copy the first two

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words two times; the last two five times. Use each word in a sentence two times." Or she might say, "Copy the two hardest words ten times; the rest five times. Use each word in a sentence two times."

FURTHER SUGGESTIONS FOR SEAT WORK

In the seat work the pupil should apply the knowledge of the methods of word study gained in the presentation exercise. It is especially important that he make the correct evaluation of words and of different parts of words. This will determine roughly the number of times each word should be repeated and the part that should be emphasized in copying. As a check upon the thoroughness and accuracy of the child's work he may be required to underline the difficult words and parts of words.

The seat work may be varied and made more intensive by combining other exercises with copying. Thus silent spelling or soft whispering may be used. The pupil spells to himself as he writes.

In this work the pupil is not blindly following directions. He is becoming conscious of the principles of learning spelling and is becoming accustomed to the use of the exercises and devices most appropriate to this work. He is acquiring a knowledge and habit of word study that will be useful to him not only in school but through life.

IMPORTANCE OF REVIEWS

Retention, a perplexing problem. The matter of reviews is undoubtedly one of the most important and pressing problems in the teaching of spelling. That teachers generally secure a high degree of efficiency in the daily lesson is shown by the high percentages of cor-

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rect spelling. The difficulty is in keeping this standard of efficiency unimpaired for any considerable time and in making sure that the same standard will be maintained in the spontaneous written work. Children show remarkable facility in forgetting the spelling of words which at one time they apparently knew perfectly, and give some evidence of a well-rounded faculty for misspelling when using well-known words in context. Teachers discover these facts to their chagrin and despair. The problem is chiefly one of selecting and timing reviews.

Difficulty of measuring retention. The discomfiture of the teacher is considerably increased by the difficulty of accurately determining the retention of words. It is a simple task to determine the spelling efficiency of a class in the daily spelling lesson. But to determine how long children retain the correct spelling of a word, when they can use a word correctly and when they cannot use it correctly, is a very complex problem under actual schoolroom conditions. The difficulty of the work is enhanced by the fact that children do not act alike, and that to some extent different words present peculiar problems.

In spite of the complexity of the problem much light could be thrown upon it by careful experimental investigations. Up to this time these investigations have not been made, so that we are left to feel our way among the byways and highways of current practices.

A measure of review provided in all written work. The teaching of words most commonly used by children in their writing provides for a measure of review in the spontaneous written exercises of the ordinary school work, which was not secured when the uncommon and the technical words predominated. However, even the

common words do not occur with sufficient frequency to guarantee their complete mastery in this manner. It is necessary to provide for more frequent contact through special exercises if complete learning is to be realized for any considerable number of words.

Maintaining a high standard of accuracy. In order that the usual work of the school may provide a real review, it is obvious that a high standard of accuracy in spelling must always be maintained. A great deal of good work in the spelling periods may be undone by a passive attitude on the part of the teacher toward the careless mistakes which occur in written exercises in other subjects. No double standard of accuracy can be maintained. There can be no habit of correct spelling in English if there is a habit of incorrect spelling in history and geography.

REVIEW EXERCISES

Review exercises to be largely written. The same principles hold in the selection of review exercises as in the selection of exercises for independent study. Practical and theoretical considerations demand that review exercises should be largely written exercises. Clear, accurate impressions of words have been formed, appropriate connections have been made, words have been repeated attentively until the connections are made with some degree of readiness and a high degree of accuracy; it remains for reviews to bring learning to the stage of automatic use. The only use for ability to spell is found in writing sentences. Practical skill in spelling must be developed in the same manner.

Disconnected sentences and short paragraphs. Written exercises for the most part will take the form

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of dictated exercises, either as disconnected sentences or as short paragraphs. The latter more nearly conform to the actual use of words in writing but require more elaborate preparation. A practical plan for the use of spontaneous compositions about a selected topic, involving the use of a particular group of words, has never been worked out.

VARIETY IN REVIEW EXERCISES

The need for securing variety and maintaining interest in the work, the time required to prepare dictation exercises where texts do not provide them, and other practical considerations have led teachers to adopt a variety of exercises for review work. In doing this we should bear in mind the specific purpose of reviews and should recognize the place and limitations of additional exercises. They should supplement, not take the place of, written contextual exercises.

Oral spelling and writing words in columns. The more important supplementary exercises are oral spelling and the writing of isolated words from dictation. These exercises are frequently organized into contests of various sorts, in which child competes with child, row with row, boys with girls, grade with grade, school with school, etc. In recent times a more salutary form of competition has come into use; namely, the competition of the child, group, or grade with its own record. Standard tests and scores will give the teacher some assistance in this work, but for the most part she will be compelled to make up her own tests from the words actually studied by the children. By the use of the graphical method of presenting results, the progress of the class may be made very clear and definite. Work of this sort proves extremely stimulating to children.

FREQUENCY OF REVIEWS

The common practice. In timing reviews our knowledge is still limited to common practice and experience. Weekly, bimonthly, midyearly, and yearly reviews appear to be popular. One of the recent spellers has this provision: "Every ninth week is a review of the previous eight weeks. The more difficult words are given in heavy black type and are repeated over and over again." Cleveland is noted for its systematic and thorough scheme of reviews. The Cleveland plan is as follows: "Each of the ten prominent words taught intensively in a week is listed as a subordinate word within the next two weeks, included in a spelling contest at the end of eight weeks, again in the annual contest at the end of the school year, and again as a subordinate word in the following year's work, used five times, in all, within two years' work." Other spellers and teachers prefer continuous reviews by making a few words each day the basis of review work.

Uncertainty in our present knowledge. As in most other respects, there is little agreement among spellers in the timing of reviews. The authority for the plan of reviews is usually not given. Where the plan of reviews is disclosed, the suggestions that are offered are frequently vague and indefinite.

Pedagogical suggestions from other sources are of a similar character. The most common precept is, "Review frequently."

Two factors to be considered: the grade of the pupil and the difficulty of the word. Two factors which need to be considered in planning reviews are the grade or the age of the pupil, and the difficulty of the word. A little observation and experience with children will show

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that words must be repeated more frequently in the lower grades than in the upper grades. The exact determination of what the different requirements in the several grades are is a problem for the future. Likewise the inequality in the difficulty and familiarity of words creates peculiar problems which must be considered and definitely provided for. Difficult or unfamiliar words need to be reviewed more frequently. Ideally each word would be considered by itself, but practically it may be found best to group words for review.

SUMMARY

1. Independent study and reviews provide the repetition necessary to automatic control.
2. Independent study should consist largely of writing words in sentences.
3. Assignments of seat work should be definite and specific.
4. A high standard of accuracy of spelling should be maintained in all written work.
5. Reviews should consist of written exercises, with oral exercises for variety.
6. Our present knowledge about timing reviews is limited and uncertain. The most common precept and example is, "Review frequently."

CHAPTER SIX

THE PREVENTION AND TREATMENT OF ERRORS

THERE is an old adage that all you need in order to spell correctly is a conscience and a dictionary. There is an important truth in this saying, but not just the one that is apparent to the popular mind. "Conscience" is taken to include a knowledge of right and wrong as well as a desire to do right. That is, in addition to its admonitory function conscience is supposed to tell one what to do and what not to do. In discussions of ethical principles the distinctions between these two aspects of conscience have been made clear. It is recognized that conscience never can tell one what he should do and what he should not do. This knowledge of right and wrong is a product of tradition, education, custom. Conscience is simply a constraining force, a desire, a feeling that one ought to do what he knows is right. The same distinction and the same principles apply exactly to spelling. We have to distinguish between the knowledge of correct spelling and the desire to spell correctly. They present two entirely different problems to the teacher.

SPELLING CONSCIENCE

Conscience-motive-correlation and use. A feeling of duty in connection with spelling may be developed by giving motive power to the work. This is done, in the first place, by tying up spelling with immediate interests and activities, whether of the school or of life outside of the school. For this purpose all the activities of the child's life where writing is a means of communication or expression may be drawn upon. The ability to write

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a friendly letter is frequently an accomplishment highly valued by young children. Notes of invitation to parties, communications between pupils and grades, correspondence with children in another locality, and orders for goods illustrate the exercises that may be used.

Stunts; contests; games; fear. Failure to impress children with the vital moral values of spelling leads to the adoption of other devices and activities more closely connected with the child's primitive instincts and interests. Some children will like spelling for its own sake. The mental activity which it requires is inherently attractive. Others find in spelling an opportunity for an exercise of their own powers, a test of strength, a feeling of mastery. To these children the spelling lesson as a kind of stunt will be attractive. The occasional use of this device will appeal particularly to the brighter children. It involves the setting up of a definite task, fraught with some special difficulty and requiring unusual concentration and effort. Thus five spelling "demons" may be assigned for mastery in a single lesson; or the word *too* may be used correctly in a written sentence by every member of the class. Third, children like to measure themselves by other people. Numerous forms of contests may be devised in which individuals and groups are pitted against each other. Fourth, the play tendency is universal. Devices involving the dramatic or play element will appeal to children, particularly in the lower grades. Interest is added if there is an element of chance or mystery, as in guessing games. Fifth, we cannot fail to mention two other motives; namely, the desire to avoid the disapproval of teacher and associates, and the fear of punishment. Learning under compulsion makes the work disagreeable for both

pupil and teacher, and the modern school tends to minimize the need for it by better teaching and by a more skillful and sympathetic handling of children.

Correct spelling, a condition of social efficiency. A third source of motives is found in pointing out the relation of spelling efficiency to remoter activities of life. The study of spelling in itself may be a bore, but if it can be shown to have a relation to the realization of desired ends, unusual interest and enthusiasm may be developed. A boy's natural dislike for the spelling routine may be overcome by showing the importance of a knowledge of correct spelling in securing a coveted position. It is a simple matter to point out the emphasis which employers in the local stores place upon attainments in the fundamental branches when choosing a clerk. Similarly, the professions, the conduct of a trade or business, and much shop work demand a knowledge of spelling. Finally, the proper conduct of the simple business affairs of ordinary life and the duties of citizenship require a thorough knowledge of a few words if not a large spelling vocabulary.

Spelling, a condition of social approval. Correct spelling is a condition of social approval as well as social efficiency. It is an approved custom, as much a mark of respectability as good manners. In a friendly letter a misspelling is a cause for deep concern. In a business letter it is inexcusable. Those who wish to maintain a respectable standing among their friends and business associates must put a check upon the idiosyncrasies of their orthography.

SPELLING CONSCIOUSNESS

Awareness of correct and of incorrect spelling. An earnest desire to spell accurately is a primary requisite

to the prevention of errors, but it is futile unless supplemented by an awareness of correct and of incorrect spelling. This has been termed the "spelling consciousness." If a child knows a word and knows that he knows it, he can use it with confidence; and if he knows that he does not know it or if he is doubtful about the spelling, he can check his opinion by some authority before using the word; but if he does not know when he is spelling a word correctly, he is helpless. The practical questions are: Do children know when they spell words correctly or incorrectly? How may a spelling consciousness be developed?

Recently an investigation by W. H. McFarland of the University of Iowa came to my attention, in which the main conclusion seemed to be, "A child does not usually know when he can spell a word and when he cannot." H. G. Lull¹ of the Kansas State Normal School, who reported the investigation, disagreed with the statement of the author. The conclusion seemed to me, also, contrary to the opinion of teachers and to my knowledge of children.

An experiment by the author. To help clear up the confusion in my own mind I devised a dictation exercise of approximately 100 common words, including 42 test words of considerable spelling difficulty. This test was given to Grades IV, VI, and VIII. A similar test was given to Grade V. After dictation, without any chance for correction, the children were required to mark each written word as follows: (✓) if they were sure that the word was spelled correctly, (X) if they were sure that the word was spelled incorrectly, and (D) if they

¹ Lull, H. G., "A Plan for Developing a Spelling Consciousness." *Elementary School Journal*, Vol. XVII, 1917, pages 355-361.

were doubtful about the spelling of the word. There was an aggregate of 10,567 spellings (100 pupils); 8803 words were spelled correctly; of this number 8569 were judged "right," 27 "wrong," and 207 "doubtful." 1764 words were spelled incorrectly; of this number, 645 were judged "right," 545 "wrong," and 544 "doubtful."

There were two chances to make a wrong judgment, calling right words "wrong" and wrong words "right." The mistakes in judgment were nearly all of the latter sort. The total number of wrong judgments was 702, or 7 per cent. When the 42 test words only were considered, the percentage rose to 13. Of the 751 words doubted, 544 or over 72 per cent were incorrect.

Conclusions. The results of the experiment indicate clearly that the children knew when they spelled words correctly. Their judgment was in error or in doubt less than three times in a hundred. It is not so clear that the children knew when they spelled incorrectly. Nearly 4 misspelled words in 10 (38 per cent) were judged "correct." Of the rest as many were "doubted" as were judged "wrong."

We must remember in interpreting the results of the experiment that we are dealing with children who had had no instruction or training in judging their own work and who had never taken a test of this kind before. No doubt children's judgments will improve with instruction and practice, but no experiments have been made to determine what extent of improvement may be expected, how soon a high degree of accuracy of judgment may be developed, or what plan is the best for securing improvement. However, because of the importance of the matter some suggestions along this line may be ventured.

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DEVELOPMENT OF A SPELLING CONSCIOUSNESS

Problems. The results of our experiment suggest, first, that in the development of a spelling consciousness our chief emphasis should be placed upon an adequate initial presentation. Children usually recognize the fact when they spell words correctly, but misspellings very frequently are allowed to pass unnoticed. Second, our particular and immediate problem is to teach children to *know* when they spell words wrongly.

Strong original presentation as a measure of prevention. The development of a spelling consciousness is effected, primarily, through getting a strong positive impression of the correct form of a word in presentation and the frequent repetition and use of this form while it is positively known, until all danger of vagueness and uncertainty is past. All that part of the previous work dealing with selecting and emphasizing the difficult words and parts of words will give to the child the initiative, the power, and the habit of directing his own work, which will be very useful at this stage of his progress.

Looking up doubtful words. One other principle of a general preventive nature is highly important for the preservation of a keen sensitiveness to correctness of spelling; that is, never take a chance in spelling a word about which you have any doubt. There is nothing that more quickly and surely undermines the security of the spelling consciousness. A mistake made through carelessness will be repeated with increasing readiness, until all feeling of certainty as to the correct form of spelling is lost. This appears to be the most frequent source of confusion in judging the misspelling of words. The unusual and unfamiliar words are not nearly so

troublesome to children as are the common everyday words which are spelled incorrectly from habit. Such words as *too* (*to*) and *stopping* (*stopping*) present the most difficult problems for correct judging.

When in doubt about the spelling of a word children should be taught to use the dictionary or, in the lowest grades, to consult the teacher. Our test shows that this habit would have prevented nearly two thirds of the spelling errors.

If children gain strong, vivid impressions of the correct spelling of words and form the habit of looking up every word when it is first doubted, errors will be reduced to the minimum.

Developing a consciousness of incorrect spelling. However effective these preventive measures may be in the future, we are beset at the present time with the task of developing in children a clearer consciousness of incorrect spelling. To this end children may be required to check their own papers for correctness of spelling before handing them in. The three judgments, correct, incorrect, and doubtful, cover all possible cases and embody as fine distinctions as may be expected of elementary school children. The marks (\checkmark) correct, (X) incorrect, and (D) doubtful are simple and to some extent standardized. Second, further weight may be given to correct judging by marking the correctness of judgment as well as the correctness of spelling. It probably will not be necessary to continue these exercises for a long time. The aim is to develop a consciousness of correct and of incorrect spelling, and the habit of checking the correctness of spelling in writing, with a view to the prevention and correction of spelling errors. When this end has been realized as shown by the correctness of the judgments, the work may be dis-

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continued. Third, there should be provision for additional study of words doubted as well as of words misspelled. If the same words are doubted by a large number of the class, they may well be placed in the class word list; if not, they will be placed more profitably in individual word lists for special study and review.

TREATMENT OF ERRORS

An ever present problem. In spite of the best efforts that can be put forth, it is found impossible to prevent all errors. They can be reduced in number by perfecting methods of presentation and review, and by developing systematic habits of word study, but they cannot be done away with entirely. There are some pupils, indeed, who seem to reach practical perfection in spelling, who seem never to miss a word, but there are always others who persist in making mistakes. Dealing with misspelling is a problem that every teacher has to face.

Some light will be thrown upon this problem by a consideration of the nature and causes of errors, and by reviewing the results of schoolroom experience and experiments with methods of correction.

CLASSIFICATION OF ERRORS

Confusion of two principles of classification. Numerous attempts to classify the errors that children make have failed to distinguish two separate problems; namely, the description of the frequencies of the different kinds of errors, such as the substitution of n for m , and the grouping of these errors according to certain presumed causes. The first is a matter of recording an objective fact. The other is an attempt to state the psychological cause for this fact.

Although quite different, both are important for the teacher. A knowledge of the cause of errors will determine fundamentally our method of treatment. Our treatment will be radically different, for example, according as errors are due to a slip of the pen or to a wrong impression of the word. A knowledge of the common mistakes that children make will enable us to emphasize the vital parts of words in correction as also in teaching, and will help us to determine the causes of spelling errors.

Errors that children make. As an objective statement of the several kinds of mistakes that children actually make, Cornman's classification is both consistent and thorough.² It is as follows:

CLASSIFICATION OF SPELLING ERRORS — CORNMAN³

I. *Motor incoördination* 483

All those classes of errors whose commission seems to have been predominantly by defect in motor process.

- a. Omission — hoase (hoarse), Main (Maine), etc. 104
- b. Addition — wolfe (wolf), etc. 034
- c. Change, substitution or illegibility leading to confusion 080
- d. M and N — swin (swim) 168
- e. Transposition — aminal (animal). Literal or syllabic 076
- f. Wrong letter doubled — speel (spell) etc... 010
- g. Attraction — Sensorimotor, roap (rope) follows soap 098

² See also the classification of G. Brandenburg, "The Spelling Ability of University Students." *School and Society*, Vol. VII, 1917, pages 26-29.

³ Cornman, O. P., *Spelling in the Elementary School*, 1902, pages 19-45.

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<i>h.</i> Attraction — Ideomotor. A letter or arrangement of letters in a succeeding word calls out a wrong form — group (group) precedes troop012
II. <i>Complication — amanole (animal)</i>022
III. <i>Sensory incoördination</i>494
(1) Phonetic.	
<i>a.</i> Standard — “Wensday,” “scolar” ..	.114
<i>b.</i> Local and individual — “chimley,” “dest”082
(2) Confusing — confusing alternatives.	
<i>a.</i> ie, ei; tion, sion; or, er, ar; ly, y (also al, le; ent, ant; se, ce, ze; ance, ence)136
<i>b.</i> Doubling — Using double letters for single letters — “Hellen,” “gass” ..	.046
<i>c.</i> Non-doubling — “galons,” “wedding” ..	.050
(3) Unclassified. Everything else — “Scuyl-kill,” “handerchief”064

Gill's classification. Another classification, by Gill,⁴ emphasizes the predominance of silent letters in spelling errors. The classification follows:

School X

1. Omission of letters	
<i>a.</i> Silent	28.0
<i>b.</i> Sounded	8.6
2. Insertion of letters	
<i>a.</i> Silent	29.9
<i>b.</i> Sounded	3.5
<i>Total due to silent letters</i>	57.9
3. Confusion of vowels	11.7
4. Inversions	10.5
5. Other cases	7.8

⁴ Gill, E. J., “The Teaching of Spelling.” *Journal of Experimental Pedagogy*, Vol. I, 1912, pages 310-319.

THE PREVENTION AND TREATMENT OF ERRORS

Common types of errors. The teachers who have taken the pains to observe what kinds of errors children make in spelling will find in the first classification many familiar types. Such are: the omission of letters, substitutions, the confusion of *m* and *n*, the transposition of letters, phonetic spelling, confusion of alternative vowels, doubling and non-doubling of letters. The second classification shows in a striking manner the prominence of silent letters in spelling errors; also, the importance of the confusion of vowels and inversions. The figures in the tables represent the number of times per hundred or per thousand that each type of error occurred.

ERRORS DUE TO THE IRREGULARITIES OF THE ENGLISH SPELLING

These tabular classifications of errors according to the character of the mistake bring out one fundamental reason for the great difficulty which we experience in teaching spelling; that is, the unphonetic character of the English spelling. Gill shows that about 70 per cent of children's errors are attributable to this cause alone. Another investigator put the estimate at 76 per cent. According to Gill, about 58 per cent of these errors are due to the omission and insertion of silent letters. Other potent causes of misspelling are the confusion of letters having the same sound, and obscure and elided vowels, as *a* in *separate*.

CHANCE ERRORS

Classifications according to the probable cause of misspelling bring out more clearly the pedagogical possibilities of the treatment of errors. Such a classification is that of Cornman, when the headings are regarded.

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The simplest classification upon which there is substantial agreement includes, first, the errors that are due to chance or a slip of the pen, and second, the errors due to ignorance of the word. The first class of errors is variously described as those due to a slip of the pen, carelessness, inattention, motor incoördination, or defective capacity for expression. In case of errors of this class the child knows how the word should be spelled when he stops to think, but the mental conditions at the time of writing are such that accidental errors creep in. The mind may be wandering aimlessly away from the work at hand, or it may be occupied with other phases of the work than the mere ordering of letters in words. Errors due to mental wandering of the first sort are certainly reprehensible and deserve the serious attention of the teacher, but they are hard to distinguish from errors of the other sort, those due to mental absorption.

Correction by the pupil. Errors of this class are not to be taken as seriously as errors due to ignorance, yet they should not be neglected. This is the kind of error that should be discovered and corrected immediately upon reading a paper after writing. Re-reading his own paper for chance mistakes should become a habit with the child. Exercises in judging the accuracy of spelling as described above will help him to form this habit. If children form the habit of correcting all possible mistakes in their written work before handing it in, their familiarity with the correct forms of words will constantly increase, and with this increased familiarity with words the probability of chance mistakes will grow less and less. On the other hand, if mistakes are allowed to stand uncorrected they will be repeated with greater ease each time until the habit of

incorrect spelling is fixed and the child does not know when he is spelling incorrectly.

Identifying errors. The accurate identification of errors due to carelessness by simple inspection is not an easy task; yet judgment is a large factor. The type of error is recognized by all teachers. We frequently hear a teacher say, "Why did you make that mistake? You know better than that." Picking out *all* the errors that belong to this group is another matter. The teacher will be aided in this work by her knowledge of the individual pupils and of the common types of errors. The types of errors commonly assigned to this class are: words not completed, words wrongly completed, omissions, additions, substitutions of letters and words, transpositions, wrong letter doubled, and errors due to the association with other words, such as *roap* (*rope*), after *soap*. They constitute about one half of all errors that are made in spelling.

Hollingworth's classification. A helpful classification of these errors, prepared by Dr. Leta S. Hollingworth,⁵ is as follows:

(a) Errors which result from automatically copying the ending of a word that is just *above* the word being spelled; e.g., "closet
clockt."

(b) Errors which result from automatically including a syllable of a word that is to *follow* the word being written, and which is therefore coming "to mind" as that word is being finished; e.g., "postcard card."

(c) Errors which result from a tendency to omit, in written spelling, one of two letters which require a similar motor response for their execution; e.g., "sd" for "sad," and "gld" for "glad."

⁵ Hollingworth, Leta S., *The Psychology of Special Disability in Spelling*, 1918, pages 38-39.

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(d) Errors which result from writing a letter that has common kinæsthetic elements *instead of* the correct letter; e.g., “dod” for “dog,” and “forn” for “form.”

(e) Errors which result from substituting a letter that has common visual elements instead of the required letter; e.g., “goiny” for “going,” and “store-heeper” for “store-keeper.”

(f) Errors (very common) which result from substituting a letter that has common phonetic elements for the required letter; e.g., “celect” for “select.”

(g) Errors which result from transposing two adjacent letters, as is so often done in typewriting; e.g., “Indain” for “Indian,” and “mintue” for “minute.”

(h) Errors which result from perseveration of an element, especially a dominant element, in a word just used; e.g., “the theeth” for “the teeth.”

(i) Errors which result from a tendency to omit the last letter of the word being written, when the initial letter of the next word has the same or a similar sound; e.g., “advise to” for “advised to.”

(j) Errors due to doubling the wrong letter in a word which contains a doubled letter; e.g., “frezze,” for “freeze.”

Idiosyncrasies. Dr. Hollingworth⁶ points out another kind of error akin to “lapsing,” but not identical with it. “This is the marked tendency of an occasional child to commit the same characteristic blunder over and over again; that is, the child has an *idiosyncrasy* for certain kinds of errors.” Examples of these idiosyncrasies are the insertion of intrusive letters, such as *n* in *counsins* and *wrinting*; and adding final *e* to words, as in *begane*, *alsoe*, *whome*. The investigation was not extensive enough to show the commonness of this fault.

⁶ *Op. cit.*, page 40.

THE PREVENTION AND TREATMENT OF ERRORS

ERRORS DUE TO IGNORANCE OF THE WORD

Kinds. The other class of spelling errors includes those due to the lack of knowledge or familiarity with the word. Through inexperience or through confusion with other words the child has received a wrong impression of the word or no definite impression at all. Mistakes of this kind the child cannot correct for himself. They constitute in large part the errors due to the phonetic spelling of unphonetic words. Such misspellings as *Wensday, scholar, oposed*, are of this character. Mispronunciations, also, tend to misspelling in the direction of phonetic translation, such as *chimley, dest, bringin*. Another source of errors is the confusion of equivalent letters and groups of letters, such as *ie, ei; er, or, ar*; etc. Cornman also includes in this list errors of non-doubling, such as *galons, weding*; and of doubling, such as, *Hellen, gass*.

Treatment. Errors of this class, constituting approximately one half of all spelling errors, are due to the faulty apprehension of words. They should be corrected not by more drill, as was usual in older practice, but by a re-presentation of the word from the beginning. An error is an indication that the original presentation has been a failure in some particular and that a new impression of the word must be made on the child's mind. The re-presentation should include all of the steps of the original presentation, if necessary, but the particular points of difficulty should receive special emphasis. Thus if the error is one of phonetic spelling, the visual phase of presentation is important, particularly that part which has to do with associating the obscure and difficult part of the word with a word of similar difficulty. Where this is not possible the child

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must learn the word by sheer force of sense memory. If the mistake is due to faulty pronunciation, then the correct form of pronunciation should be emphasized. Or, if the mistake is one of confusing vowels and diphthongs, then visual presentation is again to be emphasized and associations made where possible. Thus the *ei* in *neither*, a common mistake, may be associated with the *ei* of *either*, a word that is seldom misspelled. Errors of doubling and of non-doubling appear to be due to phonetic spelling and confusion with other words in which the visual analysis of the word is at fault. The visual form of the word should be re-presented, with special emphasis upon syllables.

THE CORRECTION OF SPELLING ERRORS

As far as possible in the detailed correction of errors the teacher should follow the general principles of the treatment of errors. The child should be given time to go over his spelling and composition paper before handing it in for final correction and grading. Children should show gradually increasing skill in this work.

Errors remaining on the papers passed in must be handled by the teacher. The most effective method of correcting errors is a nice problem for experimentation. As yet it has not been thoroughly investigated. We may say that words missed by a large number of the pupils, say one fifth of the class, should be carried over into the next lesson and re-presented as described above. Words missed by only a few pupils must for the most part be taken up with the individual pupils. It has been found that crossing out the misspelled word, writing the correct form above, and returning the paper to the pupil for copying gives satisfactory results. In

another case it was found that simply calling attention to misspelled words by conspicuous marking is negligible in results. As far as possible the teacher should give to the pupils directions governing the corrective work. The suggestions should be brief and specific, calling attention to the child's particular difficulty with the word and telling him how this difficulty is to be overcome. The word should be corrected at once, included as a part of the pupil's next day's spelling lesson, and placed on the individual word list for special review. The teacher calls for special words after the regular lesson.

CHRONIC BAD SPELLERS

In spelling, as in almost every school subject, the teacher has to deal with some pupils who are especially deficient in ability to learn the subject. The problem will be simplified in some cases by disregarding the children who are out-and-out mental defectives,—for example, those whose mental quotient is 70 or below according to Terman. Unfortunately these children are still to be found in classrooms with other children. They should be disregarded in planning curricula and methods, as they are mentally disqualified for the regular work of the school. The peculiar problem of the teacher is to deal with those children who range between very slow and very bright in other subjects but who are wanting in spelling ability. Spelling ability is a specialized mental function, and there are pupils in every class who are “born short” in this particular.

Causes of bad spelling. The limited study of this group of children has resulted in attributing bad spelling to a variety of causes. Among these are: inaccurate observation, defective memory, dependence upon

association processes, poor observation, physical defects, and poor methods of teaching.

Physical defects. With the exception of physical defects, the treatments of these topics have been highly speculative and conjectural. Several investigators have found that there is frequently a close relationship between poor spelling and some physical defect. As a result of a close investigation of five adult "incorrigible bad-spellers," Wychoff⁷ says, "The tests for optical defects showed astigmatism in four of the poor spellers, short sight in one, normal vision in one only of the five." Witmer's⁸ extended treatment of the clinical case of a boy apparently unable to acquire the correct spelling of English words, together with his observation of a large number of similar cases, led him to the same conclusion. He says, "I have found in such cases that the chronic bad spelling is invariably associated with some form of defective vision."

*Dr. Hollingworth's investigation.*⁹ Recently the whole question of the psychology of bad spelling has been subjected to an elaborate and painstaking investigation by Dr. Leta S. Hollingworth at Teachers College, Columbia University. The investigation gives valuable evidence on the mental processes involved in learning to spell, the order in which these processes occur, the relation of spelling ability to general intelligence, the causes or determinants of error in spelling, the meaning and extent of special disability in spelling, and the possibilities of increase in efficiency.

Certain results of this illuminating study have been

⁷ Wychoff, A. E., "Constitutional Bad Spellers." *Pedagogical Seminary*, Vol. II, 1892, pages 448-451.

⁸ Witmer, L., "A Case of Chronic Bad Spelling." *Psychological Clinic*, Vol. I, 1907, pages 53-64.

⁹ Hollingworth, Leta S., *op. cit.*

referred to in appropriate places in the text. We are concerned here, primarily, with the facts regarding abnormally bad spellers.

What is disability in spelling? The author's view is that the bad speller is not different in *kind* from spellers in general. That is, he does not form a "separate intellectual species, set apart from 'normals' by some definite pathological condition, but for which he would have been 'normal.'" Rather, the difference between spellers in general and bad spellers is one of *degree*. They constitute the "fag end" of the normal distribution of spelling ability.

Extent of disability in spelling. The extent of special disability in spelling, taken by the author to mean "an innate inability to form some or all of the special bonds requisite for spelling words," is not very great. The author concludes that about 2 per cent of school children have a special disability in spelling sufficient to hinder them in their school progress.

Progress in spelling efficiency. Children of this group make little progress in acquiring spelling, although normally intelligent and hard working, and without visual or auditory defects. Two fifth-grade pupils at the end of 20 weeks' instruction amounting to 1 hour per day had less spelling ability than an 8-year-old child. It is doubtful whether the gain is worth the effort required of pupil and teacher, and whether the child should be required to pursue the regular course of instruction.

Pedagogical measures. "Since they are continuous with children in general in such ability, it follows that, broadly speaking, they may be taught in the same way and by the same methods which are most advantageously employed with children at large." However,

the work of the teacher will be greatly facilitated by psychological analysis which will show what particular bonds or associations are weak or wanting. Exercises should be selected which are most appropriate to the particular deficiency.

Other causes of poor spelling. The investigation led the author to conclude that over 80 per cent of bad spelling in the Experimental Class of eighteen pupils was due to other causes than special disability in spelling. These causes are not discussed in detail, but are listed as follows: general intellectual weakness, lack of interest, distaste for mental drudgery, intellectual inertia, previous learning in a foreign language, sensory defects, and bad handwriting.

Backward pupils. This group of children is distinguishable from the smaller group by their relatively greater educability. The cause of misspelling is not a congenital disability but a temporary physical defect or mental weakness which may be remedied by proper treatment. Thus, defect in vision may be improved by the use of eyeglasses, lack of interest may be overcome by suitable pedagogical devices, etc. The group embraces those children who, although *backward*, hold a higher place in the scale of efficiency than the defective group and who have no discoverable special disabilities in spelling.

Teaching these pupils is one of the most difficult and trying problems which the teacher has to solve. All of her pedagogical insight and skill will be required to solve it successfully. Class methods will have to be supplemented if not replaced by appeal to the child's personal interest and peculiarities. To determine the cause of misspelling is the first step. The teacher will be greatly assisted in this by an expert psychologist.

The next step is to select and apply appropriate remedies. These will be suggested in general by the causes of misspelling in each particular case, but it will be necessary for the teacher to work out the detailed plans and devices.

SUMMARY

1. Errors will be prevented in large measure by rendering spelling vitally significant to the child, and by developing a spelling consciousness.

2. Significance and interest are attached to spelling by applying it in forms of written work with which the child is vitally concerned, by showing its practical utility in adult life, and by the use of contests and games.

3. Experiments show that children know when they spell words correctly, but that their knowledge of incorrect spelling is extremely vague.

4. Hence, in the development of a spelling consciousness emphasis should be placed upon adequate initial presentation and upon looking up doubtful words.

5. Our particular and immediate task is to teach children to know when they spell words incorrectly.

6. Errors may be divided roughly into two classes: chance errors, or slips of the pen, and those made through ignorance of the word.

7. Errors of the first class, such as the omission, substitution, and transposition of letters, should be discovered and corrected by the pupil before handing in his written work.

8. Errors of the second class should be corrected by re-presentation, not repetition.

9. Words missed by a large number of pupils should be carried over into the next lesson. Other errors must be treated individually.

10. A small per cent of poor spelling is due to innate disabilities. Children having such disabilities should be excused from the regular spelling work.

11. By far the larger part of poor spelling is due to remediable causes, such as temporary physical disability, general intellectual weakness, and lack of interest. As far as possible these causes should be discovered and removed.

CHAPTER SEVEN

TESTING

IN the ordinary course of the daily work it is necessary for the teacher to determine the efficiency of her instruction, to locate difficult words, to determine their particular difficulties, to find when words have been learned and where further instruction or drill is needed, to locate individuals who need special help and to determine the particular help needed.

PRELIMINARY TEST

Purpose. To accomplish these things it is necessary to use tests of various kinds. One of these is the preliminary test. The preliminary test is a test given before instruction is begun, to find out what words children already know, what words are difficult, how time should be distributed among the words of the lesson, and what the particular spelling difficulties of the words are.

Nature. For the saving of time and for convenience in marking, the preliminary test should consist of the dictation of isolated words. It will be found convenient also to include several days' lessons in one test. The test should be given some time before the actual teaching of words, in order to give time for the impressions of words incorrectly spelled to die out. We found it well to include in the preliminary test the new words for a week and to give the test on the Friday preceding the week in which the words were taught. Good reasons can be given for including a larger number of words in the preliminary test and increasing the interval between this

test and the actual presentation of the words. This interval might well be 4 to 6 weeks instead of 1 week.

Correcting papers. For the correction of the papers the most expeditious method that will give accurate results should be used. Above the third grade we have found that the teacher can spell the words back to the children and rely upon their judgment and honesty for satisfactory marking. In the third grade, in dealing with foreign children, we find that the teacher must do most of the work of correcting. When words are spelled back to the children, it should be made clear that no grade will be given on the work; in fact, it is not necessary to place names on the papers. The teacher may check the accuracy of the children's work by remarking a set of papers once in a while. If carelessness or inaccuracy is observed, the method should be changed.

Making a record of errors. In recording errors, also, as much work as possible should be placed upon the children. Of course, the information desired is the number of times each word was misspelled. If the children assist in checking the misspelled words, it is a simple matter for the teacher to make a count of the errors by having all who missed a word raise their hands. The teacher records the results in her plan book. In the lowest grades the teacher may have to do this work for herself. The simplest way is to take a list of the words and go over the papers one by one, making a check mark each time a word is missed.

Tabulated results — average word difficulties. The tabulated results of the preliminary test will consist of the number of times each word was misspelled. By comparing these with the number of pupils present, conveniently placed at the top of the column, it will be

possible to determine the relative difficulty of each word.

Common misspellings and sources of difficulty. One other fact is important for teaching; namely, the determination of the particular spelling difficulty of each word. To find this the teacher should look over the preliminary test papers for the most frequent form of misspelling or the part of the word causing the greatest difficulty. These may be placed conveniently on the lesson plan.

Provision for emphasizing individual needs. In the preliminary tests, as also in the main and review tests, children may be taught to discover for themselves the hardest words as well as the parts of words causing the greatest difficulty. For this purpose individual word lists should be prepared, containing words missed in the preliminary test with common misspellings, and words missed and sources of errors in the review tests.

MAIN TEST

Following the instruction and drill periods it is advisable that teachers give a test to determine the extent of learning, to find out where further drill is needed, and to discover what pupils need special help. It is not necessary that these be given each day. When the teacher becomes sure of her methods and results, the testing may take place once a week.

Column test. It is customary to use a column test for this purpose. This practice is justified on the grounds of expediency rather than upon its pedagogical merits. As a measure of expediency it is defensible until a better and at the same time an equally practical method is found. The difficulties are that it does not show the child's skill in the contextual use of words and

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that it does not give the child practice in using words in the way in which they will be used in life.

Sentence or contextual test. The sentence or contextual test has the advantages which the column test does not have, but it also has the disadvantage of being harder to prepare, mark, and score. If these difficulties can be avoided by some means which the individual teacher may devise or by satisfactory provisions in textbooks and courses of study, there is no question about the contextual test being a fairer and more valuable method.

Administrative details. In order to get clearer evidence of the thoroughness of the child's knowledge of the words, it is well for the main test to be given some time after the presentation and study periods and for the teacher to avoid artificial aids such as the unnatural pronunciation of words by syllables. As far as possible the children should assist in marking papers as in the preliminary test, but greater caution is necessary here to avoid dishonesty, since the marks have an important relation to the pupil's standing in school. As in the preliminary test, also, the number of times each word is misspelled should be noted and recorded. Sources of errors will be localized, then, both as to words and pupils, so that the more frequently misspelled words can be selected for further class study and the words missed by a few pupils can be treated individually. As before, the test papers will reveal peculiar tendencies and forms of misspelling. These will be useful to the teacher in the corrective work.

REVIEW TEST

A third kind of test is necessary to determine the duration of the children's knowledge of words and to

give them further practice in the use of words. These tests should occur occasionally as the need for review demands and should unquestionably be of the contextual sort. Our primary aim is to develop skill and facility in the use of words. This can be done best by giving words in the way in which they are naturally used. The teacher will meet difficulties similar to those met in connection with the formation and use of the main tests, but school administrators and makers of courses of study give valuable assistance when the need is recognized. There is no reason why practical dictation exercises should not be presented regularly as parts of courses of study and textbooks on spelling.

The suggestions on giving, marking, and scoring tests and the use of results, given in connection with the preliminary and main tests, are pertinent here.

SUMMARY

1. Three kinds of tests are distinguishable: preliminary, main, and review tests.
2. The purpose of the preliminary test is to provide the teacher with accurate and detailed information as to the average and particular spelling difficulties of words before teaching.
3. The main test follows the teaching exercise as a test of immediate recall.
4. Review tests occur after longer intervals to show retention and to give children additional drill in the use of words.
5. The main and review tests should be written contextual exercises, although expediency at times favors the use of oral and written column exercises.

CHAPTER EIGHT

THE MEASUREMENT OF SPELLING EFFICIENCY

THE preliminary, daily, and review tests, described in the preceding chapter, serve very well the limited purposes for which they are intended, but they do not make possible the comparison of different groups of children or the performances of the same group of children at different times. The tests consist of different words, and no attempt is made to secure lists of words of equal difficulty. Therefore any difference in results in the comparison of groups of children is quite as likely to be due to a difference in the difficulty of the tests as in the achievements of the several groups.

Likewise the judgment of the teacher, the other accepted means of determining the standing of pupils, while sufficiently accurate and reliable for certain purposes, has failed when put to the same tasks.

With the recognition of the serious limitations of the older methods of determining children's achievement in spelling, there has come a clearer realization of unsolved, vital educational problems. We find the modern teacher asking herself such questions as these: Does my class rank as high in spelling efficiency as other classes of the same grade? Do they show as much improvement? What is the normal standing and what improvement may be expected of children of my grade? What is a better means of classifying children? How much time should be devoted to spelling? How should this time be distributed among the grades? What is the best method of presenting words? Is nationality an important factor in determining spelling efficiency? In addition to these problems, the supervisor and super-

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intendent are concerned with the rating of teachers and the manifold tasks of supervision.

STANDARD TESTS AND SCALES

The inadequacy of the old forms of testing and the pressing demands for the solution of important educational problems have led to the development of finer instruments for measuring the spelling efficiency of children. The chief characteristics of these newer instruments of testing are the selection of a uniform list of words and the determination of an average score by giving them to large numbers of children of the same grade. In several conspicuous cases the further step was taken of arranging the words in steps of difficulty, forming a "scale." Finally, one investigator, Dr. Buckingham, related the words so scaled to a "zero point" of spelling ability, making it possible to use the *times* statement in comparing words and children.

The Buckingham scale. To Dr. Buckingham¹ belongs the credit of making the first important study of standardization in spelling. His particular problem was to develop a *scale* for measuring spelling ability. He prepared separate scales for each grade and one for all grades taken together. The material of the last, the general scale, consists of the 50 words of the Preferred Lists, and in addition 75 words of the Rice Test and 50 words of the Easy 50-Word Test. The words of the Preferred Lists were selected for commonness from those words agreed upon by two or three of five popular spellers; and second, for regularity of progression in difficulty through the grades, from a percentage not too

¹ Buckingham, B. R., *Spelling Ability: Its Measurement and Distribution*, 1914.

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low in the lower grades nor too high in the upper, as determined by actual testing. Each of these words has a place on the scale determined by the times with which it was spelled correctly in each grade, and is referred to the zero point of spelling ability as a point of reference. The intervals between the words are irregular but have a known value. The scale may be used as a whole by selecting words to be spelled at equal intervals, and by grouping words so that the groups are equal or differ by equal amounts.

The Ayres scale. The second study of importance is that of Dr. Ayres.² The study is an elaborate attempt to develop a practical spelling scale. One thousand words were selected on the basis of commonness from four important objective studies of the words used in the writing of children and adults, and were arranged in columns of difficulty as determined by the spellings of 70,000 school children. The columns are arranged in order of difficulty and vary in difficulty by equal steps. The per cent of times by which the words of each column were spelled correctly in several grades is given at the top. The scale may be used by making up tests from the various groups and comparing the results with the standard scores.

Ayres' 10-word tests. Dr. Ayres prepared also a special set of standardized tests composed of ten words for each grade from the second to the eighth, inclusive.³ Each set of words is of such difficulty that 70 per cent of the children of the grade can spell them correctly. The set is used as a whole in testing the pupils of a grade.

² Ayres, L. P., *A Measuring Scale for Ability in Spelling*, 1915.

³ Ayres, L. P., "Tests in Spelling." *The Public School of Springfield Survey*, 1914, pages 71-74.

The Starch lists. A third study should be mentioned, that of Professor Starch.⁴ Six hundred words were selected at random from *Webster's New International Dictionary* and were arranged in lists of one hundred words each. The lists are approximately equal in difficulty, and average results for a large number of pupils are given. In spite of the elimination of all technical, scientific, and obsolete words, the lists contain many words which are entirely foreign to a child's vocabulary. Since they contain many words with which a child seldom or never comes into contact, the tests do not measure real spelling ability. As a measure of the *breadth* of a child's vocabulary, they probably have some value.

UTILITY OF STANDARD TESTS

Common test words provided. The value of these standard lists of words and scales appears in several particulars. First, they provide test words of assuredly common use. This was determined by an objective analysis in Ayres' study and by a very careful selection in Buckingham's study. The advantage gained in using such words is the greater chance for equality of familiarity in comparing different groups of children.

Words of known difficulty provided. Second, the studies provide properly evaluated test material. The knowledge of the difficulty of words makes it possible to devise tests of uniform difficulty and related degrees of difficulty. This gives us a means of comparing groups and of measuring growth in spelling efficiency with greater accuracy than we have been able to do it heretofore.

⁴ Starch, Daniel, "The Measurement of Efficiency in Spelling." *Journal of Educational Psychology*, Vol. VI, 1915, pages 167-186.

In such tests it is important to have a large number of words from which to choose, so as to avoid the effect of practice where the same material is used. Ayres' study allows greater freedom in the choice of words than Buckingham's, although the latter is to be supplemented largely in the near future.

Another advantage of evaluated test words is in the matter of marking. The failure to take into account the varying difficulties of words has been a frequent source of error in grading tests. It is impracticable to weight each word separately. By the use of these studies it is possible to make up tests with words of the same difficulty, and thus, in marking, all words may be given the same value.

A more accurate comparison of different groups of children made possible. Third, the use of these tests makes it possible to compare one group with another where the same or different words are used. In the first instance where a uniform test is used the comparison is direct, although the words may vary considerably in difficulty for the several groups. However, the same result is secured where different lists have known degrees and relationships of difficulty. The Ayres list renders it possible to make these comparisons with greater readiness; the Buckingham list, with greater precision.

"Standards" of efficiency provided. Fourth, these tests provide average scores with which the standing of any group of children may be defined in terms of the achievement of a large number of children. The accuracy of the comparison depends upon the degree of uniformity of conditions in giving the test. Where the procedure is largely unknown, as in Ayres' study, comparison is so much the more liable to be inexact. On the

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other hand, Buckingham's thoroughness in maintaining and reporting uniform conditions of procedure makes it possible to have practical uniformity of administrative conditions.

LIMITATIONS TO THE UTILITY OF STANDARD TESTS

The practical value of these standard tests is chiefly in the ease and precision which they have contributed to the work of school supervision and administration. As aids to the teacher, they have not been so successful. As such they have a number of limitations.

Lack of precision. In the first place, comparisons based upon these tests are not precise. Instead of being compared with children of similar class and environment, the child is *measured* by the achievement of a heterogeneous group of children of various ages, races, nationalities, school conditions, home environments, and the like. The chance that the pupil in question is like the median or standard pupil of the scale in these particulars is only one in many thousands. Yet, unless this is true, the test is not a fair one for him.

The measurement of groups, such as grades and even schools, is usually to some extent unfair for the same reasons. Thus, scores made up of the average achievements of all children of a cosmopolitan district is no standard with which to compare the efficiency of a grade or even a school of foreign children. This is particularly true in the lower grades, where the language handicap is greatest. To be perfectly accurate the group to be measured must be so large as to represent a fair selection from all classes and conditions of children in the standard test. This is so rarely the case that the chances are largely against getting a fair comparison.

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Specific results of spelling instruction not measured. Second, scales do not necessarily measure the results of spelling instruction. This follows from the fact that many words occurring in the test have not been taught in the grade where the test is given. It is quite possible also that many of the words have not been taught lower in the grades. To the extent that this is true, the tests measure children's efficiency in picking up the spelling of words incidentally in connection with reading, writing, etc., rather than their efficiency in learning words in the specific spelling drill. Ballou⁵ says, "It is as a measure of spelling instruction that the scale (Ayres) is at fault."

Specific growth in spelling efficiency not measured. Third, scales do not measure specific growth in spelling efficiency. To illustrate: a teacher cannot test her class in September and again in January and expect to get a mathematical statement of the class's improvement for the 20-week term. To determine the amount of improvement, she must find the growth of the class in ability to spell the words actually taught during the 20 weeks.

In attempting such a use of the Ayres scale, Hollingworth⁶ found that according to the scale the children who were not instructed in spelling made as much improvement as the specially instructed group. After pointing out the absurdity of this conclusion, she makes the following statement: "It is, therefore, psychologically impossible to measure increments of Spelling Ability, due to general instruction over a period of

⁵ Ballou, F. W., "Measuring Boston's Spelling Ability by the Ayres Scale." *School and Society*, Vol. V, 1917, page 270.

⁶ Hollingworth, Leta S., *The Psychology of Special Disability in Spelling*, 1918, pages 63-66.

weeks, by means of the Ayres Spelling Scale. In order to increase the child's ability to spell the test words on the scale he must be taught those specific words."

Scales expressed in terms of static efficiency rather than of growth in efficiency. A fourth practical limitation to the utility of standard tests is the expression of units of amount in terms of static efficiency rather than in terms of growth in efficiency. It is important for the teacher to know what degree of efficiency is to be expected of her grade, but it is more important for her to know how much *improvement* ought to be made during a stated period of instruction. Improving the spelling efficiency of her class is the primary concern of the teacher. An instrument which enables her to measure the extent of her progress and sets up a goal toward which she may direct her efforts will render her an incalculable service.

Teacher's attitude toward the movement. While, therefore, scales as constituted at present fail the teacher in the solution of the problems which to her are the most vital, the movement is still in its infancy and it has large possibilities for development. The fact that there is an ever increasing demand for the accurate evaluation of her work and products, and that the present standardizing movement is a potential means of meeting this demand, suggests that teachers should give the largest possible support to the movement. At the same time, we should be critical of its weaknesses, with a view to getting more practical and efficient instruments of measurement.

MISUSES OF SCALES AND STANDARD TESTS

Confusing terms. In addition to the limitations mentioned in the preceding section, the use of standard

tests and scales is frequently misunderstood and abused. Confusion frequently arises through a misunderstanding of terms.

In fact, the movement has been so beclouded with confusing terms and analogies, that the layman is abundantly justified in becoming a little muddled as to the legitimate use of the tests. Such terms as "standard" and "measure" suggest that there are degrees of efficiency which children of certain grades *ought to reach*, — for example, that an average of 84 in column J of the Ayres scale is a figure that *ought to be attained* by any third-grade pupil. Of course, this is absurd.

It would seem that to use standard tests intelligently it is necessary for the average person to bear in mind that, properly speaking, standard tests do not set forth standards at all; that to exceed the standard for the grade is not of itself meritorious; that to fall below the standard may not be a disgrace. In fact, the standard test does nothing more or less than give an average of the achievements of a large number of children, and defines the spelling efficiency of one group in terms of the achievement of another. To expect more than this is to mistake the meaning and use of *standard tests*.

Misunderstanding and misuse of statistical results. A second source of confusion in the use of these tests arises from a misunderstanding and misuse of statistical results. People tend to take figures at their face value, with little effort at interpreting them according to their derivation. But, if this is a matter of common knowledge, are not the leaders of the movement for the development of instruments for statistical investigations to blame for not safeguarding the use of these instruments against common misconceptions and misinterpretations? As a matter of fact, investigators and school

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men continue to give out statistical facts with little or no effort at describing or explaining their derivation or meaning. An explanation of the conditions under which facts are obtained is just as essential to the true interpretation of results as a knowledge of the results themselves.

USE OF STANDARD TESTS

Problems for investigation. The first step in the use of standard tests and scores is the selection of a problem for investigation. Probably the most important and interesting problem which will be suggested to the teacher is the comparison of the standing of her class with the average or standard score. Another matter of immediate interest is the determination of the growth in class efficiency and the comparison of this growth with that of other classes. Other problems more or less vitally connected with the work of the teacher are the classification and promotion of pupils, the comparison of methods and devices of teaching, the frequency of reviews, the amount and apportionment of time devoted to spelling, individual differences in spelling efficiency, the condition of chronic bad spelling, and the evaluation of the factors affecting spelling efficiency, such as nationality.

Problem must be practical and definite. Care must be taken in selecting a problem that is practical,—that is, adaptable to experimental investigation,—and exactly defined. Investigations of “a drill method,” for example, are useless unless we know what the specific form of drill is. Again, such terms as “the personality of the teacher” and “environment” are entirely too vague to yield significant results.

Study of other investigations of the same problem.

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Much light will be thrown upon the problem under study by a knowledge of the investigations along similar lines. It will help define the problem, suggest methods of procedure, and give significance to the results. The teacher will find it extremely worth while to refer to other investigations of the same problem before proceeding with her work.

Selection of material. The next step is the selection of the material for the test. The material will depend in large part upon the nature of the problem under investigation. If the problem has to do with the measuring of pupils, as for purposes of classification, then a large number of words should be selected, say 100 to 200 words. On the other hand, the comparison of whole classes may be made with fewer words, 50 to 100. In addition to the sufficiency as to quantity the words should be uniform in difficulty or have a known degree of difficulty and, in so far as practicable, should be equally familiar to all children or groups of children of the test. For fine investigations of methods of teaching it will be well also to secure homogeneous material, such as phonetic words.

Avoiding constant errors. Where group tests are made, care should be taken to avoid constant errors, such as selecting the brighter members of the class in getting general class averages, or choosing words recently reviewed by certain groups for general comparative purposes. Also, the number of children chosen should be large enough to balance chance variations. It is claimed that twenty-eight cases is sufficient to give typical results. The children should represent a typical selection from the age, grade, sex, nationality, race, school, and region under investigation.

Methods of investigation: statistical and experi-

mental-pedagogical. Classroom studies may follow either of two general methods of investigation. The first, the statistical method, is especially fitted to the determination of general group tendencies, in which large numbers must be measured in order to get significant results. Comparisons are made upon statistical results of group tests. The other method of investigation involves the direct comparison of two pedagogical processes, such as methods of presentation, by means of comparing the growth in efficiency of two groups of children in which the processes under study are the only variable factors. It is called the experimental-pedagogical method. The method chosen must fit the problem under investigation.

General plan of procedure the same in either method.

The general plan of procedure is largely the same in using either method. The plan of the investigation should provide for several repetitions of the same test under different conditions. In the more formal investigations these include a preliminary test, which is used to locate difficulties and to familiarize the experimenter with the giving of the test; the main test, which gives the chief results of the investigation; and the control test, which is used to verify the results of the main test.

The control of variable factors. In order to get comparable results it is necessary that all conditions and variable factors except the one under investigation be kept the same. These include, first, the manner of presentation. In the giving of standard tests it is quite necessary that the facts of presentation be known and followed. The manner of presentation can play a considerable part in determining the results. Where teachers give tests, they should follow uniform instructions.

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It is important also to give tests at the same period in the school term. It makes considerable difference, for example, whether a standard of efficiency is taken for the grade at the beginning, middle, or end of the term. Other external factors which should be controlled in finer experiments are the time of day, humidity, temperature, writing material, seating as affecting the opportunity for copying, time for correcting work, and the child's speed of writing.

Other factors, which may be designated as those internal to the pupil, should be controlled. The most important of these is motive. A special appeal to the child's interests or ambitions will have a powerful influence upon the energy and care which he puts into the work, and so will vitally affect the result. The appeal to the children should be kept the same. Other important factors are the preparation for the test and the mental condition of the pupils, especially fatigue.

Checking results. In all testing the checking of results is an important matter. The need for the saving of time in school testing demands that the teacher get as much assistance as possible from the children. Any plan for doing this which gives accurate results may be used. As a rule the marks should be verified by the teacher. In ordinary school testing it is impracticable to give weight to errors according to their difficulty. Therefore it is best to use words of approximately equal difficulty so that this is rendered unnecessary. In more formal testing, specific rules for checking results, defining clearly the status of doubtful errors, are necessary. Also, care should be taken to verify all marking and to weigh errors according to the difficulty of the word.

Recording results. The recording of results is a matter that should receive more attention. To be com-

plete the statement of results should show the number of pupils participating in the test, the number of words, the total number of spellings, the total number of words correctly spelled, or of errors, and the appropriate percentages. Tables should show also the distribution of facts, with an average or median as a measure of central tendency and a figure showing the variability. Tabular presentations should bring out the relations between the important factors compared. Groupings also make the analysis of results more complete, such as the averages of the one-fourth best and of the one-fourth poorest spellers. These relationships can be presented very clearly and vividly by the use of graphs. It is well also to accompany the tables and graphs with a brief descriptive statement. Finally, the results of the investigation should be given in general and detailed verbal statements.

Drawing conclusions. The drawing of conclusions is the final step of the investigation. Conclusions should be distinguished from inferences and pedagogical suggestions. The first is a simple statement of facts based upon the results of the experiment. Inferences and suggestions are implications of the real facts based in part upon the results of the experiments and in part upon the investigator's general knowledge and experience. As a rule only limited conclusions can be drawn from any one experiment. They should be specific and definite.

SUMMARY

1. Problems involved in the measurement and comparison of the achievements of large groups of children have occasioned the development of standard tests and scales.

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2. Two conspicuous and widely used instruments are the Buckingham scale of 50 words and the Ayres scale of 1000 words.

3. The practical values of these scales are: (a) They provide common test words of known degrees of difficulty; (b) they make possible a more accurate comparison of different groups of children; (c) they provide "standard" scores.

4. From the point of view of the classroom teacher the limitation of the scales is that (a) the measurements lack precision, because they do not measure the specific results of spelling instruction; (b) they do not measure growth in spelling efficiency; (c) they are expressed in terms of static efficiency rather than of growth in efficiency.

5. Confusion and actual misuse of "standard" tests arise from a misunderstanding of terms and of statistical results.

6. In the use of scales the following points should receive the special attention of the teacher: the selection of a practical problem for investigation; the selection of pupils and material; the choice of a method of investigation; the development of a plan of procedure; the control of variable factors; checking and recording results; and drawing conclusions.

CHAPTER NINE

FACTORS AFFECTING SPELLING EFFICIENCY

OF equal importance to the problems involved in the teaching of spelling are the problems which concern primarily the organization and administration of the spelling work. One of these has been discussed in the preceding chapter, the measurement of spelling efficiency. Other problems have to do with the determination of the general policies of the school in regard to the organization of classes, the preparation of the course of study, the selection of a general method of teaching, the determination of the amount of time that should be given to spelling, and the apportionment of this time among the grades. The success of this work will depend in part upon the accurate evaluation of the factors affecting spelling efficiency. These factors include spelling material, methods, amount of time, grade, age, sex, nationality, and general efficiency.

SPELLING MATERIAL

The importance of spelling material as a factor in determining spelling efficiency was treated at length in the first chapter of this book. Suffice it to repeat here our general proposition that practical efficiency in spelling rests primarily upon the ability to spell the words that are being used at the time and the words that will be added to the writing vocabulary in the near future.

Spelling reform. In a previous connection, also, it was brought out that three fourths of the difficulties that we meet in spelling are due to the peculiar char-

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acteristic of the English language, the unphonetic spelling of words. This fact has suggested to some students of the problem the need for a radical spelling reform. But this is the hope of the dreamer rather than the expectation of the practical educator. English spelling reform has been going on for hundreds of years, and at several periods in the near past it has been somewhat accelerated by organized efforts in this direction; but the changes that have been effected have failed to free the English language from its traditional shackles. The chances are that this will not be accomplished for many years to come, and too much should not be expected from the movement in the way of immediate relief. Yet spelling reform is gradually coming about, and the teacher, as one of the largest beneficiaries, should do all in her power to further the movement.

Teaching properly sanctioned simplifications. The schools cannot go in advance of public opinion in the matter, but where general sanction is given to new forms of spelling there is no reason why these should not be accepted and taught. At least twelve such simplifications out of a total of 300 recommended by the Simplified Spelling Board in 1906 have been generally advocated and adopted by leading American scholars, higher educational institutions, and newspapers. These are: *program, catalog, decalog, prolog, pedagog, tho, altho, thoro, thoroly, thorofare, thru, and thruout*. These forms are recognized by *Webster's New International Dictionary*, and they have been adopted by the National Education Association. At the July, 1916, meeting of the National Education Association, it was voted to adopt another simplification recommended by the Board — the use of the *t* in the place of *ed* when *ed* is sounded like *t*, and where the change does not affect the pronun-

ciation; i. e., *fixt* for *fixed*, *blest* for *blessed*, *kist* for *kissed*.

SPELLING METHODS

It has been assumed in the preceding pages that method is an important factor in producing efficiency in spelling — that spelling is a subject that can be *taught*, and that there are right and wrong methods of teaching it.

Contrary conclusions of Rice and Cornman. This view, which is generally accepted by teachers, has not been allowed to pass unchallenged by experimenters. The first important American investigator reached the sweeping conclusion that there is no direct relation between methods and results. Following Dr. Rice^{1, 2} Cornman³ claimed that the time devoted to the specific spelling drill bears no discoverable relation to the result. These two conclusions are not borne out by succeeding investigations, in which the problem was approached by a more direct method and conditions were more carefully controlled. Practically every investigation, in which specific methods of teaching have been compared under exactly defined and controlled conditions, has given evidence of the superiority of certain methods.

Drill vs. incidental methods. The particular controversy in the field of general methods is about the relative value of drill and incidental methods of teaching. Cornman's investigation led him to favor the incidental

¹ Rice, J. M., "The Futility of the Spelling Grind." *Scientific Management and Education*, pages 65-99.

² Tidyman, W. F., "A Critical Study of Rice's Investigation of Spelling Efficiency." *Pedagogical Seminary*, Vol. II, 1915, pages 391-400.

³ Cornman, O. P., *Spelling in the Elementary School*, 1902.

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method. Wallin ⁴ completely disapproved this, saying, "Teaching spelling exclusively by a well-organized drill gives more satisfactory results than teaching it exclusively by the incidental method." The confusion concerning the relative value of the drill and incidental methods was caused in part by the failure to limit the investigation to a specific drill method and to a specific incidental method, and in part by the failure to secure adequate control over the other varying factors. The investigators show that satisfactory results can be obtained by either method under certain conditions. Neither has shown the superior value of the drill or the incidental method under precisely the same conditions. In short, the investigations leave us about where we started as far as a knowledge of the relative value of the two methods is concerned.

This confusion is not so apparent in general theory and practice. Few advocate or attempt the teaching of spelling apart from formal drill upon isolated words. This practice is supported in part by the indirect evidence of Winch,⁵ Turner,⁶ and others, where some form of drill work demonstrated its superiority to a less direct method.

AMOUNT OF TIME DEVOTED TO SPELLING

Negative value of time. The time element is another one of those factors about which Rice ⁷ and Cornman ⁸ made striking statements. As a result of their investigations it is claimed that there is no relation be-

⁴ Wallin, J. E. W., *Spelling Efficiency in Relation to Age, Grade, and Sex, and the Question of Transfer*, 1911.

⁵ Winch, W. H., *op. cit.*

⁶ Turner, E. A., *op. cit.*

⁷ Rice, J. M., *op. cit.*

⁸ Cornman, O. P., *op. cit.*

tween spelling efficiency and the amount of time devoted to spelling. A similar conclusion was reached in a recent survey of the Oakland, California, schools.⁹ It shows that for entire grades and for separate classes there was no definite relation between minutes per week and the class or grade standing.

Time not the most important factor. Just what meaning is to be inferred from these facts is a question. It seems to me that the least likely explanation is that spelling is a subject not susceptible to methods of teaching. This is clearly disproved by repeated comparative studies of methods. Rather, these results show that the amount of time spent is not the most important factor in the situation. Of far greater importance is the way in which the time is spent.

Whatever the meaning of these facts, the practical consequences are important. They stimulate a critical examination of time allotments and methods of teaching.

Need for economy. The results of the Oakland survey suggest that there is still room for improvement in these particulars. With the ever increasing demands for more emphasis upon the social or content subjects, it should be a constant consideration on the part of school officials to reduce the time necessarily devoted to spelling to a minimum. This is possible only by increasing the effectiveness of our work in other particulars, principally in the selection of words and methods of teaching. Our aim should be not to get the best possible results in spelling, but to get the best possible results with the least expenditure of time and effort.

Measures of economy. No doubt much time is still

⁹ Department of Public Instruction, Oakland, California, *Spelling Efficiency in the Oakland Schools*, 1915.

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wasted through the use of poorly chosen word lists and inferior methods of teaching. Fifteen to twenty minutes per day should be the maximum amount of time allotted to spelling. It is possible to get satisfactory results on even less time. It is a disputed question whether the formal study of spelling may not be omitted from the two lower grades. And, when the work in the preceding grades is well organized and effectively taught, the time necessarily devoted to spelling in the two upper grades may be considerably reduced. Experience seems to indicate that it should not be eliminated entirely. One of the few conclusions of the recent Cleveland investigation was: "The incidental teaching of spelling in junior high schools seems not to function as well as the definite assignment in the regular elementary schools." Further, it is possible that we may find upon more extended investigation that more time and effort should be concentrated in the lower intermediate grades, where the growth in spelling efficiency is most rapid.

GRADE AND SPELLING EFFICIENCY

Wide distribution and overlapping of children's abilities. It would seem that the purpose of grading is to get children of approximately equal spelling ability together. Repeated investigation shows that, whatever the intent and purposes, this is far from realized in actual school administration. We find children in the third grade spelling as well as children in the eighth, and children of the fifth grade matching the spelling efficiency of children in every other grade in school. This wide distribution and overlapping of children's abilities shows the marked limitations of our present system of grading. In general, children of the lower

grades show greater variability than those of the upper, due partly to the large loss through elimination in the upper grades.

Progression from grade to grade. Grading has more significance when whole grades are compared. Then it becomes clear that there is a progression in ability from grade to grade. The early investigations, in which separate tests of miscellaneous words were used, did not bring out this fact. When uniform or standard tests were used, as in the studies of Kratz,¹⁰ Buckingham,¹¹ Hornbaker,¹² and myself,¹³ the fact becomes clear.

Greatest improvement in the lower grades. Now the more debatable and important question is how this improvement is distributed through the course. Definite knowledge of this fact would throw some light upon the variation in emphasis which should be given to spelling in the various grades. The results that are available show that the improvement is considerably greater in the lower grades. The improvement in the third and fourth grades is over twice as great as that in the fifth, sixth, and seventh. To get a more definite notion of this fact it would be necessary to devise tests better fitted to the work than the uniform test. The present conclusions seem to favor stressing spelling in the lower intermediate grades.

¹⁰ Kratz, H. E., "A Study in Spelling." *Studies and Observations in the Schoolroom*, pages 127-140.

¹¹ Buckingham, B. R., *op. cit.*

¹² Hornbaker, W. R., "A Spelling Test for the Whole School." *Educational Bi-monthly*, Vol. VIII, 1914, pages 351-353.

¹³ Tidyman, W. F., "The Relation of Age, Grade, Sex, and General Efficiency to Spelling Efficiency." *Experimental Studies of Spelling*, Thesis, New York University, 1915. Unpublished.

AGE, SEX, AND SPELLING EFFICIENCY

Age. Age in relation to spelling efficiency presents about the same facts and problems as grade. That is, there is wide variability in individual achievements and large overlapping in the several age groups. Thus the Oakland survey shows the distribution of 13-year-old children through all the grades, and this is taken as "striking evidence that chronological age means almost nothing in school organization."

It is true of age, also, that each age group when taken as a whole shows an increase in efficiency over the preceding group. The increase from 9 to 12 is about twice that from 12 to 15.

Girls better spellers than boys. A comparison of the sexes gives conclusive evidence that girls are more efficient spellers than boys. This appears in every grade and increases gradually with age. Only about one third of the boys do as well as one half of the girls. It appears that boys' ability spreads over a wider range than girls', but the evidence is not conclusive in this matter. The differences in sex will throw some light upon the general problem of individual differences. Girls can do more work than boys, and this should be demanded of them. Girls could complete the course in spelling in from one sixth to one eighth less time than the boys.

Significance of individual and group differences. The wide range of ability in the same grade presents peculiar problems for the teacher in dealing with individual and group differences. It will mean that a given lesson has practically no difficulty for some pupils, moderate difficulty for others, and extreme difficulty for still others. The solution of this problem will be fur-

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thered by adequate administrative provisions, such as special classes for bright and for backward children, irregular promotions, and the use of assistant teachers. In doing her part, the teacher should first become aware of the extent of individual differences and locate the individuals at the extremes. Then, by varying the assignments and keeping individual review lists she should try to fit the tasks to the abilities of the children.

NATIONALITY AND SPELLING EFFICIENCY

Nationality an important factor. The presence in many of our schools of a large foreign element has increased the complexities of teaching and raised new problems. One problem is the effect of nationality upon individual differences in achievement. The negative statement of the earlier investigators is untenable. In a preliminary comparison of foreign children, chiefly Italians, and American children, not including negroes, in one school, the author found marked differences. The Italians averaged 15 per cent below the Americans in the third and fourth grades, 5 per cent below in the fifth and sixth, and 6 per cent above in the grammar grades. The higher percentage in the grammar grades was due in a measure at least to the dropping out of a large number of the poorer Italian pupils. However, this does not explain the change in the intermediate grades. It seems probable that by the time the intermediate grades are reached the handicap due to ignorance of the English language is largely overcome and that the native ability of the children is allowed to assert itself.

Facts from the Oakland survey. Further evidence of the effect of nationality upon the standing of pupils in

school is given in the Oakland survey.¹⁴ It appears there that in every grade the foreigners fall below the average for the grade. The amounts of these deviations are: Grade III, 3.1 per cent; V, 2.3 per cent; VIII, 2 per cent. This does not represent the actual difference between Americans and foreigners, since both are included in the general averages. On the average the foreigners fell about 5 per cent below the Americans. This would mean about 6 per cent in the third grade and 4 per cent in the eighth. The foreign children there represent selections from every part of Europe, in about the same numbers. The effect of any one nationality is not so clear and in many cases the language is not a handicap. Yet the differences are large enough to be conspicuous and to demand consideration.

Not so much should be expected of foreign children as of Americans. This is important in making out the course of study as well as in teaching. In using standard scores, also, it will be necessary to take the matter of nationality into consideration. For these purposes it is important to obtain more accurate statements of the differences caused by nationality.

Other social factors. Other social factors creating individual differences are environment, the personality of the teacher, the father's occupation, children's occupational ambitions, and home language. The last three were treated rather fully in the Oakland survey. Some interesting facts were brought out, which, however, admit of different interpretations. Thus it was found that children of professional men rank considerably higher than children of laborers, and that in between

¹⁴ Department of Public Instruction, Oakland, California, *op. cit.*, pages 49-54.

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these lie children of clerks, officials, business men, agriculturists, and artisans.

Children ambitious to be teachers, writers, and musicians seem to show a relatively high grade of spelling efficiency. On the other hand, if the ambitions look toward baseball, labor, or nursing, the chances are that the spelling efficiency of the child will be low. However, the differences are not so large as to be striking.

“The influence of the home language seems not to be very evident, since the errors made by children of foreign homes are in the main identical with those made by children whose home language is English, and are made in approximately similar proportions.”

GENERAL EFFICIENCY AND SPELLING EFFICIENCY

Spelling efficiency has been regarded generally as a highly specialized mental trait bearing little or no relation to general mental ability. Recent investigations of the question show that this extreme view is untenable. In 1915 the author¹⁵ compared the standings of about 500 pupils in two schools, Grades III to VIII, in respect to spelling efficiency and general efficiency based upon an average of the marks received in all the school subjects. The relationship was very close, as indicated by a coefficient of correlation of .5. In the same year Houser¹⁶ reported a similar study and reached the same conclusion. The coefficient was practically the same, .5. Hollingworth¹⁷ found a coefficient of .419 when the spelling abilities of nine normal pupils, the

¹⁵ Tidyman, W. F., *op. cit.*

¹⁶ Houser, J. D., “Relation of Spelling Ability to General Intelligence and to Meaning Vocabulary.” *Elementary School Journal*, Vol. XVI, 1915, pages 190-199.

¹⁷ Hollingworth, Leta S., *The Psychology of Special Disability in Spelling*, 1918, page 14.

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Control Group, were related to "mental age." Brandenburg¹⁸ found that the pupils ranking highest in general scholarship make the fewest errors in spelling. He says, "It is clear that we have a very substantial correlation."

SUMMARY

1. Problems of organization and administration depend for their solution, in part, upon the accurate evaluation and balancing of the factors affecting spelling efficiency.

2. Efficiency in spelling depends primarily upon the right choice of words.

3. The reform of English spelling is too slow to give much hope for immediate relief in that direction.

4. Method is an important factor in determining spelling efficiency.

5. The apparently negative value of the time element suggests the need for economies, foremost among which is the careful selection of words and methods of teaching.

6. Grading is chiefly conspicuous for the wide distribution of ability within the grade, and the large amount of overlapping among the grades.

7. The greatest improvement is made in the lower grades.

8. Age presents facts similar to those of grade.

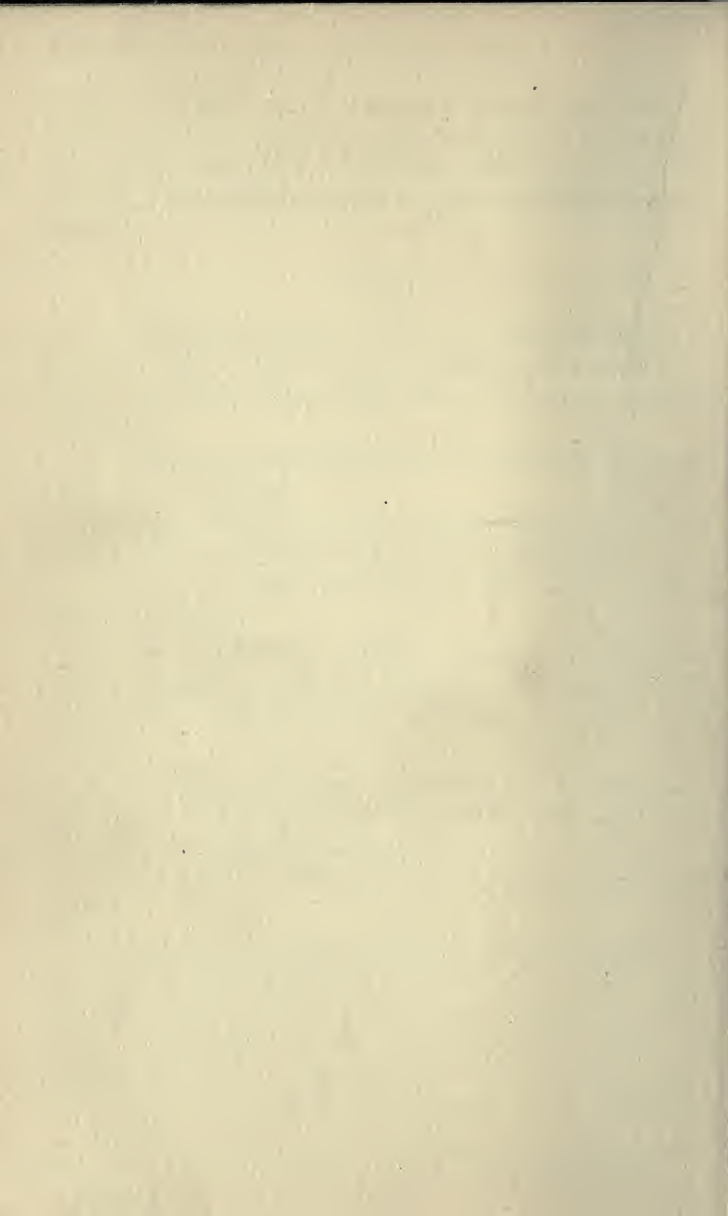
9. Girls are better spellers than boys. Only about one third of the boys do as well as one half of the girls.

10. Nationality is an important determinant of spelling efficiency. The specific cause of the inferiority of certain classes of foreigners is not apparent,

¹⁸ Brandenburg, G. C., "The Spelling Ability of University Students." *School and Society*, Vol. VII, 1917, pages 26-29.

but the handicap of the lower grades seems to disappear as the child advances.

11. The positive relation of spelling efficiency to general efficiency is shown in the coefficient of .5.



APPENDIX A

SPELLING PLANS

I. SPELLING PLAN AND RECORD SHEET. GRADE VI, HART SCHOOL. HELEN A. BROWN, TEACHER. (For description see page 26.)

Week of Feb. 14	Pre- limin- ary test Fri- day	Mon- day, Feb. 14	Tues- day	Wed- nes- day	Thurs- day	Fri- day	Review test March 3
No. present	44	40	40	40	40	40	43
courage	12	1				0	1
careful	3	0				0	2
which	1	0				0	0
their	3	1				0	3
there	2	1				1	2
business	10	2				2	1
service	18		1			1	3
servant	16		0			1	1
faithful	19		0			1	1
many	2		0			1	0
friend	7		0			2	0
since	6		0			0	2
explanation	21			4		2	4
attention	16			3		2	2
always	3			0		3	2
write	4			1		0	0
writing	8			2		0	0
once	1			0		0	0
declaration	36				3	1	4
description	20				2	2	10
vacation	20				1	0	3
doctor	7				0	0	2
often	14				0	0	3
automobile	22				5	0	2

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II. STEPS IN TEACHING SPELLING. HORACE MANN SCHOOL ¹

Write one of the new words on the blackboard and teach it in accordance with the following plan. Then erase it and write the next word, teaching it in the same way. Continue in this way throughout the list.

(a) While writing the word, pronounce it distinctly.

(b) Develop the meaning orally either by calling for a sentence using the word or by giving its definition.

(c) Divide the word into syllables. Call on pupils to spell orally by syllables. Have them indicate what part of the word presents difficulties, or whether the word contains parts they already know.

(d) Have pupils write the word on practice paper several times, spelling it softly as they write.

(e) Allow the class a moment in which to look at the word again, and then have them close their eyes and try to visualize it, or use any other device of a similar nature. Have considerable repetition, both oral and written.

III. PLAN OF PRESENTING WORDS. GRADE III A, HART SCHOOL. NELLIE V. WEDDERSPOON, TEACHER.

TIME: 15 MINUTES

Words and spelling difficulty: *steam* 19/32; *please* 17/32; *race* 17/32.

Commonest errors: *stem*; *pleas*, *ples*, *plece*; *rase*, *rac*, *rass*.

Words are on the blackboard at the opening of school. Erase at the beginning of the spelling lesson.

I. Taking up words one at a time, the teacher writes the word on the board and pronounces it. Children pronounce after her.

II. Several children use word in a sentence until it is clear that they know the meaning.

III. Visualization. In what way are *steam* and *please* alike? Underline similarities. Pick out familiar parts.

¹This plan is presented through the courtesy of Mr. H. C. Pearson.

Associate with *ease, team, tea*. Sound *steam*. How many sounds? How many letters? Why are there five letters and but four sounds? Sound *please*. How many sounds? Letters? Why six letters and but four sounds? Sound *race*. How many sounds? Letters? What difficulties in this word? What words have the same *ace* ending? Erase words.

IV. Rewrite word. Children look at it. Spell it looking at it; without looking at it. Call on individuals. Write it on paper. Look to see if it is correct.

V. Write words in lesson from memory.

In the final test mistakes were made as follows: *steam*, 3; *please*, 2; *race*, 0.

IV. PLAN OF PRESENTING WORDS. GRADE IV B, HART SCHOOL.

SARA A. WARD, TEACHER. TIME: 15 MINUTES

Words	Degree of difficulty	Chief difficulties
1. <i>acorn</i>	11/35	acron, acourn
2. <i>bled</i>	21/35	blad, blood
3. <i>heap</i>	29/35	heep
4. <i>leap</i>	25/35	leep

1. *Acorn*.

I. Write word on the board and pronounce it. Children pronounce.

II. Children give sentences.

III. Divide into syllables.

IV. Children pick out known words, as *or* and *corn*. Underline. Emphasize hard parts. Associate with *or* and *corn*.

V. Children spell word orally with eyes closed.

VI. Children write word two or three times.

2. *Bled*.

I and II as above.

III. Omit.

IV. Find a word we have had (*led*). Give words of same family, such as, *fled, bed, red*.

V and VI as above.

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3. *Heap*.

I and II as above.

III. Omit.

IV. Find hard part (silent *a*). Think of words we have had with *ea*, sounded as \bar{e} , in them, such as *cream, seat, meal*.

V and VI as above.

4. *Leap*.

I and II as above.

III. Omit.

IV. Compare with *heap*.

V and VI as above.

If time remains, play guessing game with the words of the lesson; or play "Hangman" with review words.

Assignment of seat work:

	Write	Use in sentences
<i>acorn</i>	2	1
<i>bled</i>	2	2
<i>heap</i>	4	2
<i>leap</i>	4	2

V. PLAN OF PRESENTING WORDS. GRADE V A, HART SCHOOL.
ELIZABETH M. DRUMM, TEACHER. TIME 20 MINUTES —
CLASS WORK 15 M.; SEAT WORK 5 M.

Word and difficulty: *druggist*, 29/38; *digging*, 18/38; *dumb*, 34/38; *deny*, 34/38.

Particular difficulty: In *druggist* and *digging*, the two *g*'s; in each case but one *g* was used. *Dumb* has a silent *b*. In *deny* the *y* has the sound of long *i* and is spelled with an *i* or an *ie*.

Preliminary: Have words on the board during the entire day.

First word: *druggist*.

I. Pronounce and have children pronounce. (In both cases be sure that the *ist* is not sounded as *est*.)

II. Several pupils use in a sentence.

- III. Rewrite in syllables: *drug gist*. Pronounce by syllables and have children pronounce after you, looking carefully at the letters of each syllable. What is the particular difficulty in this word? Underline it. What is the last letter of the first syllable? The first letter of the last syllable? Look at the word again. Spell it aloud. What other word in the lesson has the same difficulty?
- IV. Close your eyes. Try to see the word.
- V. Spell orally together. Have those who spell poorly or carelessly spell individually.
- VI. Write word two or three times on paper.

Second word: *digging*.

I and II as above. Be sure that the *ing* is well sounded.

III, IV, V and VI as above.

Third word: *dumb*.

I and II as above.

III. What is particularly hard about this word? Underline the difficult part. Can you think of any other word that has silent *b* at the end? Associate with *lamb* and *comb*.

IV, V, and VI as above.

Fourth word: *deny*.

I and II as above.

III. What is the particular spelling difficulty? Underline it. Place *try*, *cry*, and *reply* on the board, and notice similarities.

IV. Close eyes and try to spell word as you see it. What is the last letter?

V and VI as above.

Seat work: Write words in sentences as follows: *dumb* and *deny* three times, *druggist* and *digging* two times.

Results of test: *druggist*, 0; *digging*, 0; *dumb*, 1; *deny*, 0.

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VI. PLAN OF PRESENTING WORDS. GRADE VI, HART SCHOOL.
HELEN A. BROWN, TEACHER. TIME: 18 MINUTES

Aim. To teach the pronunciation, spelling, and use of the following words: *generally, especially, respectfully, fully.*

Preliminary. The group of words was given to the class as a column exercise before the words had been studied, and the degree of difficulty of each word was found as indicated below: *generally, 9/27; especially, 20/27; respectfully, 11/27; fully, 4/27.*

The *ll* (*l*) was a common error in all words except *fully*. The first syllable of *especially* was also frequently misspelled, *ex.*

The words remained upon the board for some time before presentation.

Presentation.

<i>fully</i>	Teacher pronounces word. Class. Use <i>fully</i> in sentences.
<i>ful ly</i>	Write word on board in syllables.
<i>ful ly</i>	Point out a common word. Underline <i>full</i> . Spell <i>full</i> . Then <i>fully</i> . Close eyes and spell <i>fully</i> . Write word on paper and spell to yourselves. <i>Let us see how the other words of the lesson are like fully.</i>
<i>generally</i>	Pronounce for class. Class pronounce. Use in sentences. Look closely at word and pronounce slowly and distinctly by syllables.
<i>gen er al ly</i>	What word do you see in <i>generally</i> ?
<i>general ly</i>	How has it been changed to make <i>generally</i> ?
<i>ll</i>	How is the word like <i>fully</i> ? Underline <i>ll</i> .

Spell the word slowly, by syllables, keeping eyes on the word. Repeat two or three times.

Class spell word with eyes closed.

Call upon poor spellers to recite.

Write word on paper several times spelling softly to yourselves.

Proceed in a similar manner with *especially* and *respectfully*, referring each time to *ll*.

Also note the following:

especially

In *especially* pick out the word *special* and underline it.

special

Write *special* on the board.

How has it been changed? What is the first syllable? Last?

Spell orally, emphasizing first and last syllables.

respectfully

Underline *spect* and *fully*.

Why is *spect* difficult?

Have several of the slower pupils spell the words of the lesson orally.

What are we going to remember about the words in today's lesson?

Seat work. Copy each word the number of times indicated on the board: *fully*, 2; *generally*, 3; *respectfully*, 3; *especially*, 5. Use each word in a sentence.

Results of test. *Fully*, 0/25; *especially*, 1/25; *generally*, 0/25; *respectfully*, 0/25.

APPENDIX B

A MINIMUM WORD LIST

1254 WORDS COMMON TO FOUR OR MORE OF THE SIX MOST RELIABLE AND EXTENSIVE CONCRETE INVESTIGATIONS OF THE WORDS FREQUENTLY USED BY CHILDREN AND ADULTS IN WRITING.

The combined investigations comprise the Jones list¹ of 4532 words, the Chancellor list² of 1000 words, the Smith³ list of 1125 words, the Cook and O'Shea list⁴ of 3200 words, the Studley and Ware⁵ list of 3470 words, and the Ayres⁶ list of 1000 words.

able	afraid	almost	answer
about	after	alone	any
absence	again	along	anything
absent	against	already	anyway
accept	age	also	appear
accident	ago	always	apple
account	agree	among	appoint
across	agreeable	amount	argument
act	ahead	an	arm
add	air	and	around
addition	alike	angry	arrange
address	all	animal	arrangement
affair	allow	another	arrest

¹ Jones, W. F., *Concrete Investigation of the Material of English Spelling*, 1914.

² Chancellor, W. E., "Spelling." *Journal of Education*, Vol. LXXI, 1910, pages 488, 517, 545, 573, 607.

³ Smith, H. J., "Words Used Spontaneously by Children." Cook and O'Shea, *The Child and His Spelling*, 1914, pages 257-264.

⁴ Cook and O'Shea, "The Spelling Vocabulary." *The Child and His Spelling*, 1914, pages 125-245.

⁵ Studley, C. K., and Ware, Allison, *Common Essentials in Spelling*, Bulletin No. 7, State Normal School, Chico, California.

⁶ Ayres, L. P., *A Measuring Scale for Ability in Spelling*, 1915.

arrive	before	both	can
ask	beg	bother	candy
asleep	begin	bottom	capital
assist	beginning	bought	car
association	behind	box	card
assure	believe	boy	care
attack	bell	branch	carpet
attempt	belong	bread	carry
attend	below	break	case
attention	berry	breakfast	cat
aunt	besides	breast	catch
automobile	best	brick	cattle
avenue	better	bridge	cause
awake	between	bright	cave
away	bicycle	bring	ceiling
awful	big	brother	cellar
awhile	bill	brown	cent
baby	bird	bruise	center
back	birth	bug	certain
bad	bite	buggy	chain
baggage	black	build	chair
ball	blanket	bump	chance
banana	bleed	bunch	change
band	blind	bundle	character
bank	block	burn	charge
barn	bloom	bury	chase
basket	blossom	business	check
bathe	blot	busy	cheese
be	blow	but	chicken
bean	blue	butter	chief
bear	bluff	button	child
beat	board	buy	children
beautiful	boat	cabin	chimney
because	body	cake	choose
become	boil	call	chop
bed	book	came	Christmas
been	born	camp	church

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circle	could	deer	during
city	count	defeat	dust
class	country	delay	duty
clean	couple	dentist	each
clear	courage	depot	ear
clerk	course	deserve	early
climb	court	desire	earn
close	cousin	desk	earth
cloth	crack	destroy	east
cloudy	crawl	diamond	easy
club	cross	die	eat
coal	crow	difference	edge
coast	crowd	different	education
coat	cruel	dinner	effect
coffee	cry	direct	effort
cold	cup	dirt	egg
collect	cupboard	disappear	eight
color	custom	dish	either
comb	cut	distance	election
come	daily	divide	else
comfort	damage	do	end
coming	damp	doctor	engine
committee	dance	dog	enjoy
common	danger	dollar	enough
company	dark	done	entertain
complete	date	door	escape
condition	daughter	doubt	especially
contain	day	down	even
continue	dead	dozen	evening
convenient	deal	draw	ever
cook	dear	dream	every
copy	death	dress	everything
corn	debt	drink	examination
corner	decide	drive	examine
cost	decision	drop	except
cottage	decorate	drown	expect
cotton	deep	due	expense

experience	fill	frighten	green
explain	finally	from	grocery
express	find	front	ground
eye	fine	fruit	grow
face	finger	full	guard
fact	finish	furnace	guess
factory	fire	furniture	guest
fail	first	further	guide
failure	fish	future	hair
fair	five	game	half
fall	fix	garden	hall
familiar	floor	gas	hammer
family	flour	gather	hand
famous	flower	gave	handkerchief
far	folks	general	handle
farm	follow	get	hang
farther	food	girl	happen
fast	foot	give	happy
father	football	glad	hard
favor	force	glass	harness
fear	forenoon	go	hat
feather	forest	gold	hate
feed	forget	gone	haul
feel	fork	good	have
feet	form	good-by	hay
fell	fort	goose	he
fellow	fortune	government	head
felt	forty	grab	healthy
fence	forward	grade	hear
fever	found	grain	heard
few	foundation	grand	heart
field	four	grapes	heat
fierce	free	grass	heaven
fifth	freeze	grave	heavy
fifty	freight	gray	heel
fight	fresh	grease	height
figure	friend	great	hello

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help	indeed	laugh	low
her	industry	law	lumber
here	information	lawn	lunch
herself	inside	lawyer	lungs
hide	intend	lay	machine
high	interest	lazy	madam
hill	into	lead	made
him	invitation	leaf	mail
himself	invite	lean	make
history	iron	learn	man
hold	jail	least	manage
home	jewel	leave	manners
honest	journey	left	many
honor	judge	leg	march
hope	judgment	lemon	mark
horn	juice	length	market
horse	just	lesson	marriage
hospital	keep	let	marry
hour	kill	letter	master
house	kind	level	match
how	kindness	lie	matter
however	king	life	maybe
hundred	kiss	light	me
hungry	kitchen	like	meal
hunt	kitten	line	mean
hurry	knee	list	measure
hurt	knew	listen	meat
husband	knife	little	medicine
ice	knock	live	member
idle	know	lonesome	men
if	knowledge	long	mend
ill	lady	look	mention
imagine	lake	loose	merry
importance	land	lose	middle
impossible	large	lot	might
in	last	loud	mile
inch	late	love	milk

mill	newspaper	one	pencil
mind	next	onion	people
mine	nice	only	perfect
minute	nickel	open	perhaps
miss	night	opinion	period
mistake	nine	opposite	person
mix	ninety	orange	personal
money	no	orchard	piano
month	noble	order	pick
moon	noise	other	picnic
more	none	ought	picture
morning	noon	our	pie
most	north	ourselves	piece
mother	nose	out	pin
mountain	not	outside	pink
mouse	note	over	pity
mouth	nothing	own	place
move	notice	package	plain
much	now	page	plan
mud	number	paid	plant
must	nurse	pail	play
myself	nut	paint	pleasant
nail	object	pair	please
name	occasion	paper	pleasure
narrow	occupy	parents	plenty
nature	ocean	park	pocket
naughty	o'clock	parlor	point
near	of	part	poison
nearly	off	particular	police
necessary	offer	party	poor
neck	office	pass	popular
need	often	past	porch
negro	oil	pay	position
neighbor	old	peanut	possible
neither	omit	pear	possibly
never	on	peculiar	post
new	once	pen	potato

THE TEACHING OF SPELLING

pound	rain	ring	seed
pour	raise	river	seem
power	raisins	road	seen
prefer	rake	roar	select
present	ranch	rock	sell
president	rate	roll	send
press	rather	roof	sense
pretty	reach	room	sent
price	read	rope	separate
principal	ready	rough	serve
print	real	round	service
prison	really	row	set
private	reason	rubber	settle
probably	receipt	rug	seven
proceed	receive	rule	several
promise	recent	run	sew
prompt	recommend	rush	shade
proper	red	sack	shadow
property	refer	sad	shake
pull	relative	safe	shall
pump	relief	said	shape
pumpkin	remains	sail	sharp
punish	remark	salary	she
pure	remember	same	shed
purpose	rent	satisfy	sheep
purse	repair	saw	shell
push	repeat	say	shine
put	reply	school	ship
quarrel	report	scratch	shirt
quarter	request	sea	shock
queer	rest	search	shoe
question	result	second	shop
quick	return	secret	short
quiet	ribbon	secretary	should
quite	rich	section	shoulder
race	ride	secure	shout
railroad	right	see	shovel

show	sold	stay	suppose
shut	sole	steady	sure
sick	solid	steal	surprise
side	some	steel	sweat
sight	somebody	steep	sweep
sign	something	stick	sweet
silk	sometime	stiff	swim
silver	son	still	swing
simple	song	stockings	system
since	soon	stone	table
sing	sorrow	stood	tablet
sink	sorry	stop	tack
sir	sound	store	tail
sister	soup	storm	take
sit	south	story	talk
six	sow	stove	taste
sixty	speak	straight	tax
size	special	strange	teach
skate	spell	straw	teacher
skin	spend	street	team
sky	spirit	strike	tear
sleep	splendid	string	tease
sleeve	spoil	struck	telephone
slide	spoon	study	tell
slip	sport	stuff	ten
small	spot	subject	term
smell	spread	succeed	terrible
smile	spring	success	than
smoke	square	such	thank
smooth	stack	sudden	that
snake	stairs	suggest	the
snow	stamp	suit	theater
so	stand	summer	their
soap	star	sun	them
society	start	supper	themselves
soft	state	supply	then
soil	station	support	there

THE TEACHING OF SPELLING

therefore	total	usual	west
these	touch	vacation	wet
they	toward	vegetables	what
thick	town	very	wheat
thin	toy	vessel	wheel
thing	track	view	when
think	train	village	where
third	tramp	visit	whether
thirty	travel	visitor	which
this	traveler	voice	while
those	treasure	volume	whip
though	tree	vote	whistle
thought	trip	wagon	white
thousand	trouble	wait	who
thread	true	wake	whole
three	truly	walk	whom
throat	trunk	wall	why
through	trust	want	wide
throw	truth	war	wife
thunder	try	warm	will
ticket	turkey	wash	win
tie	turn	waste	wind
tight	twelve	watch	window
time	twenty	water	winter
tip	twice	wave	wire
tire	two	way	wish
to	ugly	we	with
today	unable	weak	within
together	uncle	wear	without
told	under	weather	woman
tomorrow	understand	weed	women
tongue	unless	week	wonder
tonight	until	weigh	wonderful
too	up	weight	wood
took	upon	well	word
tooth	use	went	work
top	useful	were	world

worry
worth
wound
wreck

write
wrong
wrote
yard

year
yellow
yes
yesterday

yet
you
young
your

BIBLIOGRAPHY

SPELLING MATERIAL

WORD LISTS

1. Ayres, L. P., *A Measuring Scale for Ability in Spelling*. Russell Sage Foundation, 1915.*¹
2. Bauer, Nicholas, *The Writing Vocabulary of the New Orleans Public Schools*. Grade lists, Grades III-VIII.
3. Boston Public Schools, *Provisional Minimum and Supplementary Lists of Spelling Words for Pupils in Grades I to VIII*. School Document No. 8, 1914.
4. Chancellor, W. E., "Spelling." *Journal of Education*, Vol. LXXI, 1910, pages 488, 517, 545, 573, 607.
5. Cook and O'Shea, "The Spelling Vocabulary." *The Child and His Spelling*, pages 125-245. Bobbs-Merrill Co., 1914.*
6. Eldridge, R. C., *Six Thousand Common English Words*, 1911.
7. Houser, J. D., "An Investigation of the Writing vocabularies of Representatives of an Economic Class." *Elementary School Journal*, Vol. XVII, No. 10, 1917, pages 708-718.
8. Johnstown, Pennsylvania, Public Schools, *List of Spelling Words*, 1918. Graded.
9. Jones, W. F., *Concrete Investigation of the Material of English Spelling*. The University of South Dakota, 1914.*
10. Kansas City, Missouri, Public Schools, *Preliminary Report of the Committee on Spelling*. Research Bulletin No. 2, 1916.
11. Lewis, E. E., *Spelling List for Use in Normal Training High Schools*. Circular No. 14, Iowa State Department of Public Instruction, Des Moines, Iowa, 1914.

¹ Starred references are especially recommended.

THE TEACHING OF SPELLING

12. McDaniel, G. M., *Tentative List of Words for Spelling for the First Four Grades*. Hammond, Indiana, 1915.
13. Monk, E. M., "Washington, D. C., Spelling List." *Elementary School Journal*, Vol. XVI, 1915, pages 96-103.
14. Pryor, H. C., "A Suggested Minimal Spelling List." *The Sixteenth Annual Yearbook of the National Society for the Study of Education*, 1917, Part I, pages 73-85. 1478 words, graded.*
15. Scofield, F. A., "Experiment in Spelling in the Eugene High School." *School and Society*, Vol. V, 1917, pages 299-300.
16. Smith, H. J., "Words Used Spontaneously by Children." Cook and O'Shea, *op. cit.*, 5,¹ pages 257-264.
17. "Spelling in Milwaukee." *Journal of Education*, Vol. LXXI, 1910, pages 153, 270, 383, 410.
18. Studley, C. K., and Ware, Allison, *Common Essentials in Spelling*, Bulletin No. 7, State Normal School, Chico, California. Graded.
19. Woolfolk, Algar, *The Need of Intensive Work in Spelling*. Master's Thesis, Teachers College, Columbia University, 1914. Unpublished.

DIFFICULTY OF WORDS

20. Ayres, L. P., *op. cit.*, 1.¹
21. Boston Public Schools, *Spelling, Determining the Degree of Difficulty of Spelling Words*. School Document No. 10, 1915.*
22. Brandenburg, G. C., "The Spelling Ability of University Students." *School and Society*, Vol. VIII, 1917, pages 26-29.*
23. Buckingham, B. R., *Spelling Ability; Its Measurement and Distribution*, pages 14-15, 69-75, 78-79. Teachers College, Columbia University, 1913.*

¹ Number indicates the reference where the work was first cited.

24. Kansas City, Missouri, Public Schools, *op. cit.*, 10.*
25. Scofield, F. A., *op. cit.*, 15.
26. Tidyman, W. F., "Translating Percentile Differences in Word Difficulty into Ratios of Amount of Difference." *School and Society*, Vol. V, 1917, pages 778-779.
27. Woolfolk, Algar, *op. cit.*, 19.

COMMON MISPELLINGS

28. Hollingworth, Leta S., *The Psychology of Special Disability in Spelling*, page 42. Teachers College, Columbia University, 1918.*
29. Kallom, A. W., "Some Causes of Misspelling." *Journal of Educational Psychology*, Vol. VIII, 1917, Table I, pages 396-397.* See also "Classes of Errors."

CLASSES OF ERRORS

30. Brandenburg, G. C., *op. cit.*, 22.
31. Cook and O'Shea, *op. cit.*, 5.
32. Cornman, O. P., *Spelling in the Elementary School*. Ginn and Co., 1902.*
33. Foster, W. T., "The Spelling of College Students." *Journal of Educational Psychology*, Vol. II, 1911, pages 211-215.
34. Gill, E. J., "The Teaching of Spelling." *Journal of Experimental Pedagogy*, Vol. I, 1912, pages 310-319.*
35. Hollingworth, Leta S., *op. cit.*, 28, pages 38-39.*
36. Kallom, A. W., *op. cit.*, 29.
37. Richman, Julia, "Spelling in the East Side Schools of New York." *Educational Review*, Vol. XXXV, 1908, pages 160-169.
38. Rusk, R. R., "Analysis of the Spelling Errors of Adults." *Journal of Experimental Pedagogy*, Vol. II, 1913, pages 119-122.
39. Stead, H. G., "Spelling Errors in Children." *Journal of Experimental Pedagogy*, Vol. II, 1914, pages 362-364.

THE TEACHING OF SPELLING

GRADING

40. Jones, W. F., *op. cit.*, 9, pages 22-24.*
41. Studley, C. K., and Ware, Allison, *op. cit.*, 18, pages 8-9.

GROUPING

42. Abbott, E. E., *On the Analysis of Memory Consciousness in Orthography*. Psychological Review Monograph Supplement, Vol. II, 1909.*
43. Arps, G. F., "Attitude as a Determinant in Spelling Efficiency in Immediate and Delayed Recall." *Journal of Educational Psychology*, Vol. VI, 1915, pages 409-418.*
- 43a. Brown, F. W., "Learning to Spell, Particularly *ie* and *ei*." *Education*, Vol. XXXIV, 1914, pages 582-587.
44. Wagner, C. A., *Experimental Study of Grouping by Similarity as a Factor in the Teaching of Spelling*. Philadelphia, 1912.*

HOMONYMS

45. Pearson, H. C., "The Scientific Study of the Teaching of Spelling." *Journal of Educational Psychology*, Vol. II, 1911, pages 241-252.*

THE PSYCHOLOGY OF SPELLING

MENTAL PROCESSES

46. Abbott, E. E., *op. cit.*, 42.*
47. Arps, G. F., *op. cit.*, 43.
48. Hollingworth, Leta S., *op. cit.*, 28, pages 79-80.*
49. Itschner, H., *Lay's Rechtschreibe-reform, im Anschluss an Versuche im Paedagogischen Universitäts-Seminars Jena besprochen*. Jahrb. d. Vereines f. Wissenschaftliche Päd., 32:206 ff. Dresden, 1900.
50. Kline, L. W., "A Study in the Psychology of Spelling." *Journal of Educational Psychology*, Vol. III, 1912, pages 381-400.

51. Lay, W. A., *Fürher durch den Rechtschreibunterrichts, gegründet auf psychologische Versuche und angeschlossen an seine Entwicklungsgeschichte und eine Kritik des ersten Sach- und Sprachunterrichts.* Wiesbaden, 1899.*
52. Lobsien, Marx, *Ueber die Grundlagen des Rechtschreibunterrichts.* Heft 2 der Sammlung von Abhandlungen und Vorträgen für Pädagogik der Gegenwart. Dresden, 1900.
53. Marique, P. J., *An Experimental Investigation in French Orthography.* Pd.D. Thesis, New York University, 1911. Unpublished.
54. Schiller, H. H., Haggenmüller, A., and Fuchs, H., *Studien und Versuche über die Erlernung der Orthographie.* Berlin, 1898.
55. Smedley, F. M., *Report of the Department of Child Study and Pedagogic Investigation, Chicago Public Schools.* Child Study Report, No. 3, pp. 62 ff., 1899.
56. Spindler, F. N., "Memory Types in Spelling." *Education*, Vol. XXVIII, 1907, pages 175-181.

CAUSES OF MISSPELLING

57. Foster, W. T., *op. cit.*, 33.
58. Gregory, B. C., "The Rationale of Spelling." *Elementary School Teacher*, Vol. VIII, 1907, pages 40-55.
59. Kallom, A. W., *op. cit.*, 29.
60. Whipple, G. M., "The Spelling of University Students." *Journal of Educational Psychology*, Vol. I, 1910, pages 31-33.
See also "Classes of Errors" and "Causes of Poor Spelling."

CAUSES OF POOR SPELLING

61. Carman, E. K., "The Cause of Chronic Bad Spelling." *Journal of Pedagogy*, Vol. XIII, 1900, pages 86-91.
62. Douse, T. L., "Psychology of Misspelling." *Mind*, Vol. XXV, 1900, pages 85-93.

THE TEACHING OF SPELLING

63. Hollingworth, Leta S., *op. cit.*, 28.*
64. Shaw, E. E., "Is Spelling a Failure?" *Educational Review*, Vol. XLII, 1911, pages 170-182.
65. Witmer, L., "A Case of Chronic Bad Spelling." *Psychological Clinic*, Vol. I, 1907, pages 53-64.*
66. Wychoff, A. E., "Constitutional Bad Spellers." *Pedagogical Seminary*, Vol. II, 1892, pages 448-451.*

THE PEDAGOGY OF SPELLING

SYLLABIFICATION AND DIACRITICAL MARKS

67. Abbott, E. E., *op. cit.*, 42.*

MEANING

68. Hollingworth, Leta S., *op. cit.*, 28, pages 53-58.*

DEFINITIONS

69. Sewell, J. W., "Definition in the Spelling Recitation." *Elementary School Teacher*, Vol. X, 1909, pages 367-375.*

METHODS OF PRESENTATION

70. Cook and O'Shea, "Methods of Presentation," *op. cit.*, 5.
71. Fulton, M. J., "On Experiments in Teaching Spelling." *Pedagogical Seminary*, Vol. XXI, 1914, pages 287-289.*
72. Hollingworth, Leta S., *op. cit.*, 28, page 16.*
73. Itschner, H., *op. cit.*, 49.
74. Kratz, H. E., "A Study in Spelling." *Studies and Observations in the Schoolroom*, pages 127-140. Educational Publishing Co., 1907.
75. Lay, W. A., *op. cit.*, 51.*
76. Lobsien, Marx, *op. cit.*, 52.
77. Marique, P. J., *op. cit.*, 53.
78. Mead, C. D., "Spelling by Visualization vs. Drill Methods." *Journal of Educational Psychology*, Vol. V, 1914, pages 29-31.

79. Schiller, H. H., Hagggenmüller, A., and Fuchs, H., *op. cit.*, 54.
80. Smedley, F. M., *op. cit.*, 55.
81. Turner, E. A., "Rules versus Drill in Teaching Spelling." *Journal of Educational Psychology*, Vol. III, 1912, pages 460-461.*
82. Winch, W. H., "Experimental Researches in Learning to Spell." *Journal of Educational Psychology*, Vol. IV, 1913, pages 525-537.*
83. Winch, W. H., "Further Experimental Research on Learning to Spell." *Journal of Educational Psychology*, Vol. IV, 1913, pages 579-592.*
84. Winch, W. H., "Additional Researches on Learning to Spell. The Question of 'Transfer' and of 'Direct' versus 'Indirect' Methods." *Journal of Educational Psychology*, Vol. VII, 1916, pages 93-110.*

SPELLING PLANS

85. Calmerton, and Puddy, Lois, "A Socialized Recitation in Spelling." *Primary Education*, Vol. XXV, 1917.
86. "Types of Spelling Lessons." *Bulletin of the State Normal School for Women, Farmville, Virginia*, Vol. I, No. 2, 1914, pages 30-57.*

THE VALUE OF RULES

87. Cook and O'Shea, "The Value of Rules," *op. cit.*, 5.*
88. Turner, E. A., *op. cit.*, 81.*

TRANSFER

89. Cook and O'Shea, "Column versus Contextual Spelling," *op. cit.*, 5.
90. Cornman, O. P., *op. cit.*, 32.
91. Mead, A. R., "Transfer of Spelling Vocabulary." *Journal of Educational Psychology*, Vol. VIII, 1917, pages 41-44.*
92. Tidyman, W. F., and Brown, Helen A., "The Extent and Meaning of the Loss in 'Transfer' in Spelling."

THE TEACHING OF SPELLING

Elementary School Journal, Vol. XVIII, 1917, pages 210-214.*

93. Van Wagenen, K., "Spelling by the Dictograph Method." *Educational Foundations*, Vol. XXVI, 1914, pages 17-20.
94. Wallin, J. E. W., *Spelling Efficiency in Relation to Age, Grade, and Sex, and the Question of Transfer*. Warwick and York, 1911.*
95. Winch, W. H., *op. cit.*, 84.

CLASS STUDY VERSUS INDEPENDENT STUDY

96. Fulton, M. J., *op. cit.*, 71.*
97. Pearson, H. C., "Experimental Studies in the Teaching of Spelling." *Teachers College Record*, Vol. XIII, Part II, 1912, Pages 37-66.*

SPELLING CONSCIOUSNESS

98. Lull, H. G., "A Plan for Developing a Spelling Consciousness." *Elementary School Journal*, Vol. XVII, 1917, pages 355-361.
99. McFarland, W. H., "Relation between Spelling Judgment and Spelling Ability." *Midland Schools, A Journal of Education*, September, 1916, pages 19-21.*

CORRECTION OF ERRORS

100. Brandenburg, G. C., *op. cit.*, 22.*
101. Richman, Julia, *op. cit.*, 37.
102. Wyatt, Stanley, "The Correction of Spelling Errors." *Journal of Experimental Pedagogy*, Vol. II, 1913, pages 124-125.*

SCALES AND STANDARD TESTS

BUCKINGHAM SCALE

103. Buckingham, B. R., *op. cit.*, 23, opp. page 82.*
104. Lewis, E. E., "Testing the Spelling Abilities of Iowa School Children by the Buckingham Spelling Tests."

Elementary School Journal, Vol. XVI, 1916, pages 556-564.

105. Sackett, L. W., "Measuring a School System by the Buckingham Spelling Scale." *School and Society*, Vol II, 1915, pages 860-864, 894-898.*
106. Sackett, L. W., "Disparity of Spelling Scales." *Journal of Educational Psychology*, Vol. VI, 1915, pages 627-630.
107. Thorndike, E. L., "Means of Measuring School Achievement in Spelling." *Educational Administration and Supervision*, Vol. I, 1915.*
- 107a. Tidyman, W. F., "A Descriptive and Critical Study of Buckingham's Investigation of Spelling Efficiency." *Educational Administration and Supervision*, Vol. II, 1916, pages 290-304.*

AYRES SCALE

108. Ayres, L. P., *op. cit.*, 1.*
109. Ballou, F. W., "Measuring Boston's Spelling Ability by the Ayres Spelling Scale." *School and Society*, Vol. V, 1917, pages 267-270.*
110. Briggs, T. H., and Bamberger, Florence E., "The Validity of the Ayres Spelling Scale." *School and Society*, Vol. VI, page 538.
111. Hollingworth, Leta S., *op. cit.*, 28, pages 60-67.*
112. Kallom, A. W., "What is a Reliable Basis for Establishing a Standard in Spelling?" *Educational Administration and Supervision*, Vol. III, 1917, pages 539-542.*
113. Scofield, F. A., "Difficulty of Ayres Spelling Scale." *School and Society*, Vol. IV, 1916, pages 339-340.

TESTS

114. Ayres, L. P., "Tests in Spelling." *The Public Schools of Springfield Survey*, 1914, pages 71-74.*
115. Hornbaker, W. R., "A Spelling Test for the Whole School." *Educational Bi-monthly*, Vol. VIII, 1914, pages 351-353.

THE TEACHING OF SPELLING

116. Kratz, H. E., *op. cit.*, 74, pages 127-140.
117. Riley, J. R., *The Springfield Tests, 1846-1905. [A Study in the Three R's]*, pages 7-12. Springfield, Massachusetts, 1914.
118. Starch, Daniel, "The Measurement of Efficiency in Spelling." *Journal of Educational Psychology*, Vol. VI, 1915, pages 167-186.

RESULTS IN THE USE OF SCALES AND STANDARD TESTS

119. Ballou, F. W., *op. cit.*, 109.*
120. O'Hern, J. P., "Practical Application of Standard Tests in Spelling, Language, and Arithmetic." *Elementary School Journal*, Vol. XVIII, 1918, pages 662-663.*
121. Otis, A. S., "The Reliability of Spelling Scales." *School and Society*, Vol. IV, 1916.
122. Sackett, L. W., *op. cit.*, 105.

FACTORS AFFECTING SPELLING EFFICIENCY

METHOD

123. Cornman, O. P., *op. cit.*, 32.
124. Rice, J. M., "The Futility of the Spelling Grind." *Forum*, Vol. XXIII, 1897, pages 163-172, 409-419.*
125. Tidyman, W. F., "A Critical Study of Rice's Investigation of Spelling Efficiency." *Pedagogical Seminary*, Vol. XXII, 1915, pages 391-400.
126. Turner, E. A., *op. cit.*, 81.*
127. Wallin, J. E. W., *op. cit.*, 94.*
128. Winch, W. H., *op. cit.*, 84.*

TIME

129. Cornman, O. P., *op. cit.*, 32.*
130. Department of Public Instruction, Oakland, California, *Spelling Efficiency in the Oakland Schools*, 1915, pages 69-71.
131. Rice, J. M., *op. cit.*, 124.*

GRADE

132. Buckingham, B. R., *op. cit.*, 23, pages 14-15.
 133. Hornbaker, W. R., *op. cit.*, 115.*
 134. Kratz, H. E., *op. cit.*, 74.
 135. Tidyman, W. F., "The Relation of Age, Grade, Sex, and General Efficiency to Spelling Efficiency." *Experimental Studies of Spelling*. Thesis, New York University, 1915. Unpublished.
 136. Wallin, J. E. W., *op. cit.*, 94.*

AGE

137. Cornman, O. P., *op. cit.*, 32.
 138. Department of Public Instruction, Oakland, California, *op. cit.*, 130, pages 24-32.*
 139. Rice, J. M., *op. cit.*, 124.*
 140. Tidyman, W. F., *op. cit.*, 135.
 141. Wallin, J. E. W., *op. cit.*, 94.*

SEX

142. Cornman, O. P., *op. cit.*, 32.
 143. Department of Public Instruction, Oakland, California, *op. cit.*, 130, pages 32-35.*
 144. Earle, E. L., and Thorndike, E. L., "A Sex Difference in Spelling Ability." *Columbia University Contributions to Philosophy, Psychology, and Education*, Vol. XI, 1903, pages 47-50.*
 145. Tidyman, W. F., *op. cit.*, 135.
 146. Wallin, J. E. W., *op. cit.*, 94.*

OTHER FACTORS

147. Cook and O'Shea, *op. cit.*, 5. Spelling efficiency and composition.
 148. Cornman, O. P., *op. cit.*, 32. *Topics*: Incidental influences of home and school, Teaching ability.
 149. Department of Public Instruction, Oakland, California, *op. cit.*, 130, pages 41-60. *Topics*: Father's occu-

THE TEACHING OF SPELLING

pation, Children's occupational ambitions, Father's nationality, Influence of home language.*

150. Earle, E. L., "The Inheritance of the Ability to Learn to Spell." *Columbia University Contributions to Philosophy, Psychology, and Education*, Vol. XI, 1903, pages 41-46. A study of fraternal resemblance.
151. Gill, E. J., *op. cit.*, 34. *Topics*: Methods in reading.
152. Hollingworth, Leta S., *op. cit.*, 28, pages 53-58. Knowledge of meaning as a factor.*
153. Houser, J. D., "Relation of Spelling Ability to General Intelligence and to Meaning Vocabulary." *Elementary School Journal*, Vol. XVI, 1915, pages 190-199.
154. Kratz, H. E., *op. cit.*, 74.
155. Rice, J. M., *op. cit.*, 124. *Topics*: Nationality, Heredity, Home environment, The personal equation of the teacher.

GENERAL EFFICIENCY AND SPELLING EFFICIENCY

156. Brandenburg, G. C., *op. cit.*, 22.*
157. Department of Public Instruction, Oakland, California, *op. cit.*, 130, pages 36-38.*
158. Hollingworth, Leta S., *op. cit.*, 28, page 14.*
159. Houser, J. D., *op. cit.*, 153.*
160. Tidyman, W. F., *op. cit.*, 135.*

SIMPLIFICATION OF ENGLISH SPELLING

161. "Decade of Simplified Spelling." *Literary Digest*, Vol. LIII, 1916, pages 609-611.*
162. "Increasing Vogue of Simplified Spelling." *Literary Digest*, Vol. LI, 1915, page 300.*
163. Lounsbury, T. R., "Confessions of a Spelling Reformer." *Atlantic Monthly*, Vol. LXXXIX, 1907, pages 614-631.*
164. Lounsbury, T. R., *English Spelling and English Spelling Reform*. Harper and Brothers, 1909.

165. Simplified Spelling Society, London, *The Pioneer of Simplified Spelling*, Vol. II, No. 7, 1913.
166. Teall, F. H., "Eccentricities in Spelling." *Scientific American*, Vol. LXXXIV, 1917, pages 280-281.

GENERAL STUDIES — SUMMARIES, DISCUSSIONS, ETC.

167. Boston Public Schools, *The Teaching of Spelling*. School Document No. 17, 1916. 21 pages. Suggestions on methods of teaching.*
168. Broome, E. C., and Redway, J. W., *A Syllabus in Spelling and Pronunciation*. Thompson Brown Co., 1912. 24 pages.
169. Broomwell, G. D., "Where and How Phonetic Spelling Should Be Used at Once." *Elementary School Teacher*, Vol. VII, 1906, pages 385-389.
170. Burnham, W. H., "The Hygiene and Psychology of Spelling." *Pedagogical Seminary*, Vol. XIII, 1906, pages 474-501. A good account of the history of the spelling movement, especially in Germany.*
171. Grupe, Mary A., "A Review of the Pedagogical Studies in the Teaching of Spelling." *Education*, Vol. XXXIV, 1913, pages 1-19.
172. Mead, W. E., "The Lost Art of Spelling." *Educational Review*, Vol. XIX, 1900, pages 49-58. The remedy for poor spelling lies in the selection of a minimum content of common words.
173. Meumann, E., "Die Erlernung der Orthographie." *Vorlesungen*. 2 Auflage, Band III, 1914, Z. 564-622.*
174. Monroe, De Voss, and Kelly, "Spelling." *Educational Tests and Measurements*, pages 112-144. Houghton Mifflin Co., 1917. A very good summary and discussion of the measurement of achievements in spelling.*
175. Pryor, H. C., "Spelling." *The Fourteenth Annual Yearbook of the National Society for the Study of*

THE TEACHING OF SPELLING

Education, 1915, Part I, pages 78-89. Current practices in spelling.

176. Public Schools of Johnstown, Pennsylvania. *The Teaching of Spelling*.
177. Richman, Julia, "Spelling in the East Side Schools of New York." *Educational Review*, Vol. XXXV, 1908, pages 160-169. Some difficulties met in teaching spelling to foreigners, with suggested remedies.
178. Rusk, R. R., "Orthography." *Introduction to Experimental Education*, 1912, pages 267-276. A partial historical account of spelling investigations.
179. State of New Jersey Department of Public Instruction, *The Teaching of Spelling*, 1912. 31 pages. A manual for teachers.*
180. Straubenmüller, Gustave, *Standards of Spelling*. New York. 7 pages. A manual.
181. Suzzallo, H., "The Teaching of Spelling." *Teachers College Record*, Vol. XII, 1911, pages 259-330. A summary of recent tendencies in the teaching of spelling.*
182. "Theory of Spelling Instruction." *Bulletin of the State Normal School for Women, Farmville, Virginia*, Vol. I, No. 2, 1914, pages 9-29.
183. Tidyman, W. F., *Experimental Studies of Spelling*, Thesis, New York University, 1915. 377 pages. Description and critical treatment of important investigations to date, together with an original investigation of the relation of age, grade, sex, and general efficiency to spelling efficiency. Unpublished.
184. Ward, C. D., "Intensive Spelling." *English Journal*, Vol. III, 1914, pages 484-489.
185. Williams, S. H., "Teaching of Spelling." *Journal of Education*, Vol. LXXX, 1914, pages 665-666.

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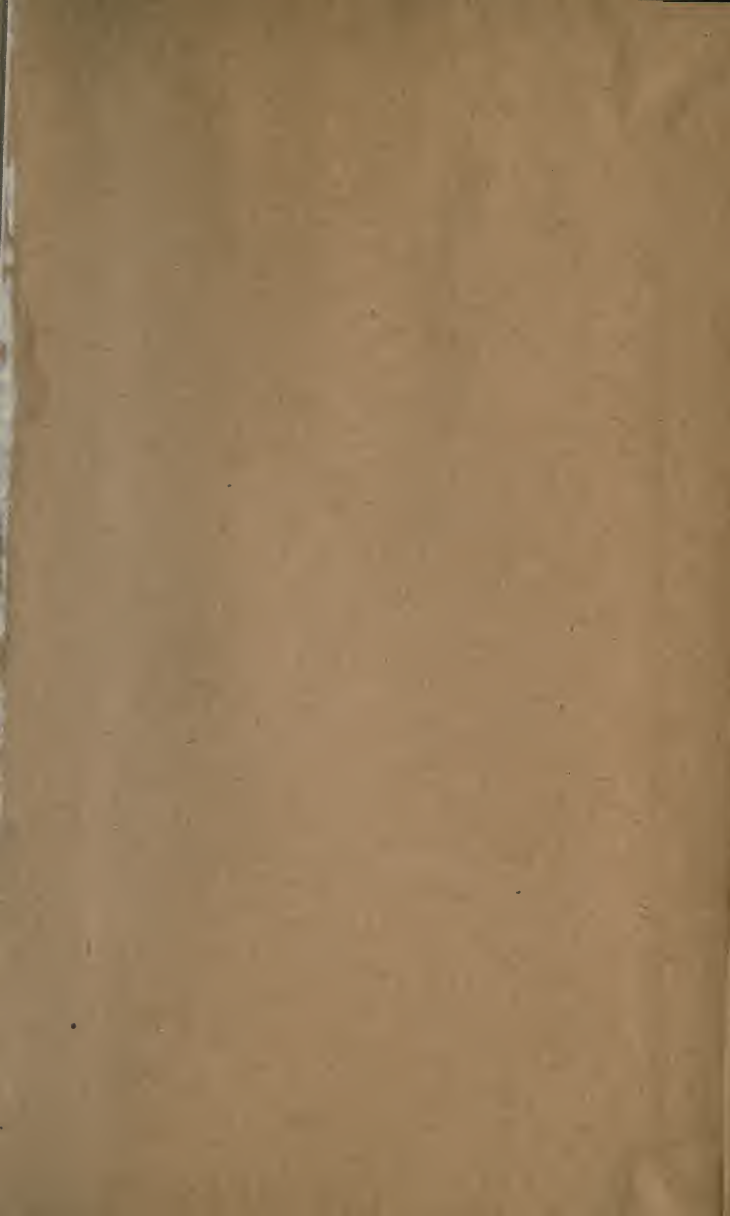
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