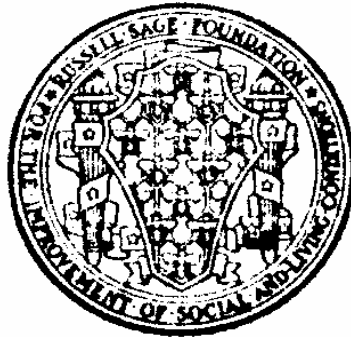


# A MEASURING SCALE FOR ABILITY IN SPELLING

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## A FOUNDATION VOCABULARY

One thousand words were finally selected as constituting such a foundation vocabulary. They were chosen by combining the results of the four most extensive studies that have attempted to identify the words most commonly used in different sorts of English writing.

The first of these studies was published by the Rev. J. Knowles in London, England, in 1904 in a pamphlet entitled, "The London Point System of Reading for the Blind." The author says of it, "Taking passages from the English Bible and from various authors, containing 100,000 words, a list was made of the 353 words which occurred most frequently, and the number of times each occurred was noted."

The second of the studies was made by R. C. Eldridge of Niagara Falls and the results were published in 1911 in a pamphlet entitled, "Six Thousand Common English Words." Mr. Eldridge made an analysis of the vocabularies of 250 different articles taken from four issues of four Sunday newspapers published in Buffalo. He found that they contained a total vocabulary of 6,002 different words, which with their repetitions made an aggregate of 43,989 running words.

He reported the number of times that each word appeared.

The third study was conducted by the present writer in 1913 and the results were published by the Division of Education of the Russell Sage Foundation in a monograph entitled, "The Spelling Vocabularies of Personal and Business Letters." The study consisted of the tabulation of 23,629 words from 2,000 short letters written by 2,000 people. The total vocabulary used was found to consist of 2,001 different words and the number of appearances of each was reported.

The last of these four studies was carried through by W. A. Cook and M. V. O'Shea and the results presented in 1914 in a book entitled, "The Child and His Spelling," published by the Bobbs-Merrill Company. This study consisted of the tabulation of some 200,000 words taken from the family correspondence of 13 adults. The total vocabulary was found to consist of 5,200 different words and the number of times each occurred was reported.

#### FREQUENT USE OF A FEW WORDS

There is one salient characteristic common to all of these studies. This is the cumulative

evidence that a few words do most of our work when we write. In every one of the studies it was found that about nine words recur so frequently that they constitute in the aggregate one-fourth of the whole number of words written, while about 50 words constitute with their repetitions one-half of all the words we write. With the exception of *very*, these words are all monosyllables.

It seems reasonable to argue from such evidence that we should do well to find out from such studies as these which words those are that constitute the foundation vocabulary used in ordinary English writing and teach them in our schools so thoroughly that the children by every day use would permanently master them. It seems equally clear that such a list of words forms a better basis for determining standards of spelling attainment than would one made of less commonly used words. For these reasons it was determined to combine the results of the several studies so as to secure the most reliable available list as a foundation for the work.

At first the purpose was to identify the 2,000 most commonly used words, but this project was abandoned because it was soon found to be impossible of realization. It is

easily possible to identify the 10 commonest words in written English. These are probably *the, and, of, to, I, a, in, that, you, for*. With their repetitions they constitute more than one-fourth of all the words we write. Save for the personal pronouns, they are essential in writing about any subject, whatever its nature, from Aaron through zythum. It is likewise possible to identify the 50 commonest words, for, like the first 10, they are true construction words and necessary, no matter what the nature of the subject under consideration. With progressively decreasing reliability the list may be extended to include the 500 commonest words and possibly the 1,000 commonest, but not the 2,000 commonest, for long before this point is reached the identity of the frequently used words varies according to the subject under consideration. For this reason it was decided to limit the foundation vocabulary to 1,000 words.

#### THE THOUSAND COMMONEST WORDS

The list of 1,000 words finally selected was determined upon by finding the frequency with which each word appeared in the tabulations of each study, weighting that frequency

according to the size of the base of which it was a part, adding the four frequencies thus obtained, and finding their average. The resulting figure shows how many times the word was repeated in each 100,000 words of written English. The aggregate amount of written material analyzed in securing these results was approximately 368,000 words, written by some 2,500 different persons. More than two-thirds of the material consisted of personal and business letters.

The tabulation of these frequencies furnished a list of several thousand words which were arranged in the descending order of the frequencies with which they occurred. From this list the 1,000 commonest words were selected and have been used as the basis for the present study. These words, together with the figures showing the frequency of appearance of each, per 100,000 running words, are given in List A beginning on page 12. The figures inserted after each 50 words show the cumulative frequencies from the beginning. Thus the first of these figures shows that the 50 commonest words are repeated so frequently that with their repetitions they constitute nearly half of all the words we write. The first 300 words make up more than three-

fourths of all writing of this kind and the 1,000 words with their repetitions constitute more than nine-tenths of this sort of written material.

In making up this list, there has been no attempt to reduce all the words to a dictionary basis. Instead the attempt has been to include all the forms of the words which present different spelling difficulties. Thus the various forms of the verb "be" are included as separate words because they present separate spelling difficulties. In the same way "man" and "men," "woman" and "women," are included for the same reason. On the other hand, plurals and verb forms presenting no characteristic spelling difficulties beyond those inherent in the singular or infinitive have not been included. This procedure has necessitated making many arbitrary decisions, but in each case the controlling purpose has been to make each decision on the basis of spelling difficulty.

While the frequencies appearing in List A have been derived as described, it should be explained that not all of the commonest words of the Cook-O'Shea list appear in this new list. This is because their publication did not appear until the present work was well under



way and most of the spelling tests had been concluded. However, careful efforts have been made to include all words appearing so frequently that the evidence seemed to warrant their inclusion. While the present list of commonest words can be improved upon, still it is believed to be more reliable as a foundation spelling vocabulary than any one of the previous lists.

**LIST A. THE THOUSAND COMMONEST WORDS ARRANGED IN THE DESCENDING ORDER OF THEIR FREQUENCY. THE FIGURES INDICATE THE NUMBER OF OCCURRENCES PER EACH HUNDRED THOUSAND RUNNING WORDS. THE FIGURES INSERTED AFTER EACH FIFTY WORDS ARE CUMULATIVE FREQUENCIES FROM THE BEGINNING**

|      |       |       |     |       |               |
|------|-------|-------|-----|-------|---------------|
| the  | 6,393 | on    | 667 | would | 362           |
| and  | 3,438 | he    | 619 | she   | 359           |
| of   | 3,422 | by    | 611 | or    | 348           |
| to   | 3,217 | but   | 572 | there | 341           |
| I    | 2,387 | my    | 557 | her   | 311           |
| a    | 1,911 | this  | 551 | an    | 298           |
| in   | 1,904 | his   | 543 |       | <u>49,615</u> |
| that | 1,422 | which | 540 |       |               |
| you  | 1,306 | dear  | 523 | when  | 288           |
| for  | 1,241 | from  | 488 | time  | 279           |
| it   | 1,197 | are   | 468 | go    | 277           |
| was  | 991   | all   | 448 | some  | 273           |
| is   | 931   | me    | 444 | any   | 257           |
| will | 873   | so    | 432 | can   | 250           |
| as   | 854   | one   | 428 | what  | 244           |
| have | 846   | if    | 408 | send  | 242           |
| not  | 831   | they  | 400 | out   | 238           |
| with | 822   | had   | 397 | them  | 238           |
| be   | 816   | has   | 391 | him   | 233           |
| your | 793   | very  | 383 | more  | 232           |
| at   | 698   | were  | 368 | about | 220           |
| we   | 695   | been  | 370 | no    | 220           |

|        |               |           |               |              |     |
|--------|---------------|-----------|---------------|--------------|-----|
| please | 211           | made      | 144           | get          | 101 |
| week   | 211           | know      | 143           | into         | 99  |
| night  | 206           | year      | 143           | let          | 98  |
| their  | 205           | before    | 138           | yesterday    | 98  |
| other  | 203           | long      | 137           | come         | 97  |
| up     | 201           | sincerely | 135           | ever         | 97  |
| our    | 200           | shall     | 133           | girl         | 97  |
| good   | 198           | sent      | 131           | also         | 96  |
| say    | 198           | us        | 131           | where        | 96  |
| could  | 193           | give      | 130           | while        | 96  |
| who    | 192           | Mr.       | 129           | did          | 95  |
| may    | 189           | like      | 128           | little       | 95  |
| letter | 188           | enclose   | 126           | look         | 94  |
| make   | 185           | next      | 125           | respectfully | 94  |
| write  | 182           | want      | 125           | afternoon    | 93  |
| thing  | 181           | hope      | 122           | Miss         | 93  |
| think  | 180           | love      | 121           | those        | 93  |
| should | 178           | men       | 121           | too          | 93  |
| truly  | 178           | old       | 118           | man          | 92  |
| now    | 177           | every     | 117           | own          | 92  |
| its    | 175           | find      | 117           | receive      | 91  |
| two    | 173           | most      | 117           | soon         | 91  |
| take   | 172           | such      | 117           | once         | 89  |
| thank  | 170           | today     | 117           | street       | 88  |
| do     | 169           | must      | 116           | ask          | 87  |
| after  | 168           | way       | 116           | down         | 87  |
| than   | 167           | first     | 115           | yet          | 87  |
| sir    | 163           | new       | 113           | see          | 86  |
| last   | 161           | seem      | 113           | since        | 86  |
| house  | 160           | morning   | 112           | cannot       | 85  |
| just   | 160           | school    | 112           | help         | 85  |
| over   | 160           | great     | 111           | away         | 83  |
| then   | 159           | wish      | 110           | course       | 83  |
| work   | 158           | home      | 109           | through      | 83  |
| day    | 157           | feel      | 106           | call         | 82  |
| here   | 157           | glad      | 106           | meet         | 82  |
|        | <u>59,591</u> | never     | 106           | people       | 80  |
| said   | 153           | three     | 106           | another      | 79  |
| only   | 151           | much      | 105           | number       | 78  |
| well   | 151           | how       | 103           | place        | 78  |
| am     | 147           | until     | 103           | Sunday       | 78  |
| these  | 146           | many      | 102           | use          | 78  |
| tell   | 145           | put       | 102           | church       | 77  |
| even   | 144           |           | <u>65,759</u> | nice         | 77  |
|        |               |           |               | sure         | 77  |

|           |               |           |               |            |               |
|-----------|---------------|-----------|---------------|------------|---------------|
| anything  | 76            | mean      | 63            | why        | 52            |
| hour      | 76            | quite     | 63            | perhaps    | 51            |
| children  | 75            | Saturday  | 63            | answer     | 50            |
| don't     | 75            | again     | 62            | half       | 50            |
| four      | 75            | Friday    | 62            | keep       | 50            |
|           | <u>70,122</u> | something | 62            | life       | 50            |
| kind      | 75            | talk      | 62            | ago        | 49            |
| oblige    | 75            | though    | 62            | business   | 49            |
| nothing   | 74            | office    | 61            | does       | 49            |
| off       | 74            | Tuesday   | 61            | each       | 49            |
| believe   | 73            | best      | 60            | eight      | 49            |
| boy       | 73            | came      | 60            | knew       | 49            |
| city      | 73            |           | <u>73,452</u> | picture    | 49            |
| found     | 72            | says      | 60            | show       | 49            |
| pay       | 72            | car       | 59            | build      | 48            |
| tomorrow  | 71            | ground    | 59            | care       | 48            |
| doctor    | 70            | room      | 59            | eye        | 48            |
| five      | 70            | thought   | 59            | gentleman  | 48            |
| o'clock   | 70            | under     | 59            | head       | 48            |
| read      | 70            | board     | 58            |            | <u>76,111</u> |
| back      | 69            | far       | 58            | left       | 48            |
| enough    | 69            | nine      | 58            | whether    | 48            |
| fine      | 69            | without   | 58            | interest   | 47            |
| order     | 69            | arrest    | 57            | January    | 47            |
| bed       | 68            | trip      | 57            | present    | 47            |
| cold      | 68            | cent      | 56            | teacher    | 47            |
| live      | 68            | right     | 56            | tire       | 47            |
| mall      | 68            | side      | 56            | upon       | 47            |
| few       | 67            | Thursday  | 56            | young      | 47            |
| hear      | 66            | friend    | 55            | done       | 46            |
| child     | 65            | bad       | 54            | high       | 46            |
| mother    | 65            | late      | 54            | sorry      | 46            |
| return    | 65            | money     | 54            | train      | 46            |
| same      | 65            | need      | 54            | whom       | 46            |
| almost    | 64            | still     | 54            | broke      | 45            |
| because   | 64            | book      | 53            | during     | 45            |
| big       | 64            | hand      | 53            | feet       | 45            |
| Monday    | 64            | mile      | 53            | itself     | 45            |
| month     | 64            | paper     | 53            | several    | 45            |
| start     | 64            | party     | 53            | brought    | 44            |
| always    | 63            | word      | 53            | everything | 44            |
| both      | 63            | madam     | 52            | run        | 44            |
| cordially | 63            | six       | 52            | took       | 44            |
| expect    | 63            | ten       | 52            | better     | 43            |

|            |               |           |               |           |               |
|------------|---------------|-----------|---------------|-----------|---------------|
| lost       | 43            | seen      | 39            | summer    | 34            |
| possible   | 43            | whole     | 39            | together  | 34            |
| September  | 43            | whose     | 39            | against   | 33            |
| sick       | 43            | action    | 38            | clean     | 33            |
| visit      | 43            | change    | 38            | decide    | 33            |
| went       | 43            | court     | 38            | issue     | 33            |
| act        | 42            | follow    | 38            | Mrs.      | 33            |
| begin      | 42            | matter    | 38            | near      | 33            |
| desire     | 42            | cost      | 37            | prompt    | 33            |
| eat        | 42            | February  | 37            | question  | 33            |
| guess      | 42            | lady      | 37            | ring      | 33            |
| hard       | 42            | part      | 37            | sit       | 33            |
| line       | 42            | reply     | 37            | stamp     | 33            |
| mind       | 42            | spend     | 37            | turn      | 33            |
| October    | 42            | attend    | 36            | winter    | 33            |
| poor       | 42            | case      | 36            | busy      | 32            |
| remember   | 42            | fall      | 36            | folks     | 32            |
| Wednesday  | 42            | however   | 36            | happy     | 32            |
| women      | 42            | July      | 36            | lake      | 32            |
| wonder     | 42            | report    | 36            | maybe     | 32            |
| conference | 41            | speak     | 36            | obtain    | 32            |
| died       | 41            | vote      | 36            | pass      | 32            |
| glass      | 41            | wife      | 36            | ran       | 32            |
| held       | 41            | bring     | 35            | study     | 32            |
| less       | 41            | company   | 35            | become    | 31            |
| understand | 41            | cut       | 35            | December  | 31            |
|            | <u>78,302</u> | member    | 35            | dress     | 31            |
|            |               | November  | 35            | early     | 31            |
| along      | 40            | open      | 35            | either    | 31            |
| August     | 40            | reach     | 35            | end       | 31            |
| evening    | 40            | regard    | 35            | except    | 31            |
| father     | 40            | woman     | 35            | farther   | 31            |
| forenoon   | 40            | according | 34            | heard     | 31            |
| large      | 40            |           | <u>80,175</u> | March     | 31            |
| meant      | 40            | between   | 34            | person    | 31            |
| seven      | 40            | bill      | 34            | rather    | 31            |
| address    | 39            | certain   | 34            | water     | 31            |
| charge     | 39            | copy      | 34            | written   | 31            |
| family     | 39            | deal      | 34            | April     | 30            |
| finish     | 39            | director  | 34            | Christmas | 30            |
| hot        | 39            | might     | 34            |           | <u>81,794</u> |
| known      | 39            | move      | 34            | country   | 30            |
| least      | 39            | rain      | 34            | fact      | 30            |
| plan       | 39            | small     | 34            | herself   | 30            |
| saw        | 39            |           |               |           |               |

|             |    |             |               |            |               |
|-------------|----|-------------|---------------|------------|---------------|
| immediate   | 30 | running     | 27            | arrive     | 24            |
| marriage    | 30 | separate    | 27            | began      | 24            |
| May         | 30 |             | <u>83,220</u> | carry      | 24            |
| provision   | 30 |             |               | distribute | 24            |
| reason      | 30 | sold        | 27            | earliest   | 24            |
| slide       | 30 | told        | 27            | effort     | 24            |
| story       | 30 | although    | 26            | hat        | 24            |
| unfortunate | 30 | among       | 26            | justice    | 24            |
| arrange     | 29 | association | 26            | lose       | 24            |
| awful       | 29 | close       | 26            |            | <u>84,479</u> |
| complete    | 29 | club        | 26            | lot        | 24            |
| fire        | 29 | dollar      | 26            | material   | 24            |
| forget      | 29 | evidence    | 26            | nor        | 24            |
| gave        | 29 | form        | 26            | sometimes  | 24            |
| kill        | 29 | himself     | 26            | struck     | 24            |
| mere        | 29 | intend      | 26            | unable     | 24            |
| nearly      | 29 | June        | 26            | various    | 24            |
| neither     | 29 | list        | 26            | anyway     | 23            |
| noon        | 29 | public      | 26            | band       | 23            |
| past        | 29 | station     | 26            | boat       | 23            |
| service     | 29 | table       | 26            | dark       | 23            |
| unless      | 29 | true        | 26            | difference | 23            |
| aunt        | 28 | already     | 25            | door       | 23            |
| ball        | 28 | appreciate  | 25            | enter      | 23            |
| character   | 28 | body        | 25            | face       | 23            |
| full        | 28 | clear       | 25            | husband    | 23            |
| further     | 28 | cover       | 25            | importance | 23            |
| learn       | 28 | driven      | 25            | lead       | 23            |
| often       | 28 | fair        | 25            | light      | 23            |
| principle   | 28 | getting     | 25            | offer      | 23            |
| ride        | 28 | got         | 25            | pleasure   | 23            |
| second      | 28 | instead     | 25            | prepare    | 23            |
| sister      | 28 | pleasant    | 25            | refer      | 23            |
| size        | 28 | price       | 25            | represent  | 23            |
| state       | 28 | relative    | 25            | rest       | 23            |
| thus        | 28 | rule        | 25            | river      | 23            |
| yes         | 28 | son         | 25            | scene      | 23            |
| afraid      | 27 | song        | 25            | special    | 23            |
| annual      | 27 | sudden      | 25            | stand      | 23            |
| automobile  | 27 | throw       | 25            | stop       | 23            |
| coming      | 27 | war         | 25            | trust      | 23            |
| date        | 27 | west        | 25            | try        | 23            |
| heart       | 27 | world       | 25            | walk       | 23            |
| law         | 27 | accept      | 24            | warm       | 23            |
| name        | 27 | alone       | 24            |            |               |

|             |               |            |               |           |               |
|-------------|---------------|------------|---------------|-----------|---------------|
| weather     | 23            | wait       | 21            | drown     | 19            |
| condition   | 22            | worth      | 21            | easy      | 19            |
| different   | 22            | beside     | 20            | escape    | 19            |
| else        | 22            | bought     | 20            | free      | 19            |
| especially  | 22            | built      | 20            | gone      | 19            |
| game        | 22            | buy        | 20            | happen    | 19            |
| grant       | 22            | carried    | 20            | hurt      | 19            |
| indeed      | 22            | destroy    | 20            | led       | 19            |
| liberty     | 22            | direction  | 20            | low       | 19            |
| necessary   | 22            | fell       | 20            | mention   | 19            |
| object      | 22            | fourth     | 20            | promise   | 19            |
| paid        | 22            | grand      | 20            | result    | 19            |
| plant       | 22            | hold       | 20            | select    | 19            |
| popular     | 22            | inform     | 20            | serve     | 19            |
| post        | 22            | lay        | 20            | soap      | 19            |
| pretty      | 22            | leave      | 20            | suggest   | 19            |
|             | <u>85,621</u> | length     | 20            | teach     | 19            |
|             |               | loss       | 20            | terrible  | 19            |
| prison      | 22            | mine       | 20            | therefore | 19            |
| road        | 22            | ought      | 20            | uncle     | 19            |
| section     | 22            | outside    | 20            | absence   | 18            |
| subject     | 22            | pair       | 20            | article   | 18            |
| success     | 22            | probably   | 20            | became    | 18            |
| supply      | 22            |            | <u>86,658</u> | behind    | 18            |
| system      | 22            |            |               | brother   | 18            |
| tax         | 22            | ready      | 20            | dead      | 18            |
| allow       | 21            | real       | 20            | delay     | 18            |
| amount      | 21            | request    | 20            | drill     | 18            |
| appoint     | 21            | spring     | 20            | effect    | 18            |
| expense     | 21            | stay       | 20            | employ    | 18            |
| felt        | 21            | stole      | 20            |           | <u>87,610</u> |
| fifth       | 21            | themselves | 20            |           |               |
| fill        | 21            | third      | 20            | entire    | 18            |
| front       | 21            | top        | 20            | entrance  | 18            |
| information | 21            | toward     | 20            | extreme   | 18            |
| miss        | 21            | watch      | 20            | fix       | 18            |
| none        | 21            | wrote      | 20            | forty     | 18            |
| press       | 21            | account    | 19            | general   | 18            |
| red         | 21            | across     | 19            | objection | 18            |
| salary      | 21            | around     | 19            | perfect   | 18            |
| secure      | 21            | card       | 19            | period    | 18            |
| set         | 21            | cause      | 19            | rapid     | 18            |
| tenth       | 21            | death      | 19            | region    | 18            |
| ticket      | 21            | divide     | 19            | remain    | 18            |
| usual       | 21            | doubt      | 19            | repair    | 18            |

|             |               |             |               |               |    |
|-------------|---------------|-------------|---------------|---------------|----|
| sail        | 18            | trouble     | 17            | black         | 15 |
| search      | 18            | aboard      | 16            | claim         | 15 |
| short       | 18            | air         | 16            | common        | 15 |
| stood       | 18            | appear      | 16            | convenient    | 15 |
| suppose     | 18            | beautiful   | 16            | convention    | 15 |
| view        | 18            | burn        | 16            | daughter      | 15 |
| white       | 18            | capture     | 16            | declare       | 15 |
| able        | 17            | career      | 16            | estate        | 15 |
| above       | 17            | check       | 16            | event         | 15 |
| assure      | 17            | contain     | 16            | factory       | 15 |
| auto        | 17            | deep        | 16            | favor         | 15 |
| baby        | 17            | direct      | 16            | God           | 15 |
| catch       | 17            | dozen       | 16            | illustrate    | 15 |
| duty        | 17            | east        | 16            | injure        | 15 |
| education   | 17            | elect       | 16            | lesson        | 15 |
| extra       | 17            | election    | 16            | minute        | 15 |
| fail        | 17            | engage      | 16            | news          | 15 |
| foot        | 17            | express     | 16            | political     | 15 |
| forward     | 17            | final       | 16            | prove         | 15 |
| goes        | 17            | finally     | 16            | rate          | 15 |
| government  | 17            | gold        | 16            | soft          | 15 |
| impossible  | 17            | horse       | 16            | suffer        | 15 |
| include     | 17            | motion      | 16            | surprise      | 15 |
| income      | 17            | north       | 16            | tree          | 15 |
| increase    | 17            | occupy      | 16            | wear          | 15 |
| inside      | 17            | preliminary | 16            | within        | 15 |
| investigate | 17            | principal   | 16            | yard          | 15 |
| judgment    | 17            | proceed     | 16            | age           | 14 |
| navy        | 17            | provide     | 16            | athletic      | 14 |
| omit        | 17            | refuse      | 16            | attention     | 14 |
| opinion     | 17            | relief      | 16            | avenue        | 14 |
| police      | 17            | retire      | 16            | bear          | 14 |
| position    | 17            | shed        | 16            | begun         | 14 |
| power       | 17            | sight       | 16            | belong        | 14 |
| prefer      | 17            | south       | 16            | camp          | 14 |
| proper      | 17            | spent       | 16            | cast          | 14 |
| push        | 17            | stopped     | 16            | circular      | 14 |
|             | <u>88,480</u> | vacation    | 16            | class         | 14 |
|             |               | weigh       | 16            | clothing      | 14 |
| raise       | 17            | wind        | 16            | collect       | 14 |
| really      | 17            | wonderful   | 16            | colonies      | 14 |
| round       | 17            | add         | 15            | combination   | 14 |
| shut        | 17            | affair      | 15            | comfort       | 14 |
| tonight     | 17            | attempt     | 15            | complaint     | 14 |
| total       | 17            |             | <u>89,284</u> | consideration | 14 |

|             |               |              |               |              |               |
|-------------|---------------|--------------|---------------|--------------|---------------|
| disappoint  | 14            | emergency    | 13            | associate    | 12            |
| distinguish | 14            | empire       | 13            | await        | 12            |
| due         | 14            | engine       | 13            | beginning    | 12            |
| feature     | 14            | enjoy        | 13            | block        | 12            |
| field       | 14            | entertain    | 13            | blow         | 12            |
|             | <u>90,011</u> | entitle      | 13            | blue         | 12            |
| firm        | 14            | estimate     | 13            | born         | 12            |
| human       | 14            | experience   | 13            | box          | 12            |
| manner      | 14            | fight        | 13            | bridge       | 12            |
| neighbor    | 14            | figure       | 13            | celebration  | 12            |
| progress    | 14            | file         | 13            | center       | 12            |
| recent      | 14            | flight       | 13            | century      | 12            |
| sea         | 14            |              | <u>90,673</u> | chain        | 12            |
| session     | 14            | flower       | 13            | circumstance | 12            |
| statement   | 14            | foreign      | 13            | citizen      | 12            |
| suit        | 14            | guest        | 13            | connection   | 12            |
| theater     | 14            | history      | 13            | convict      | 12            |
| visitor     | 14            | important    | 13            | develop      | 12            |
| agreement   | 13            | imprison     | 13            | examination  | 12            |
| alike       | 13            | improvement  | 13            |              | <u>91,299</u> |
| allege      | 13            | jail         | 13            | famous       | 12            |
| application | 13            | newspaper    | 13            | fortune      | 12            |
| argument    | 13            | organization | 13            | height       | 12            |
| arrangement | 13            | personal     | 13            | honor        | 12            |
| beg         | 13            | piece        | 13            | ice          | 12            |
| chief       | 13            | play         | 13            | inspect      | 12            |
| cities      | 13            | primary      | 13            | invitation   | 12            |
| clerk       | 13            | receipt      | 13            | judge        | 12            |
| command     | 13            | responsible  | 13            | land         | 12            |
| committee   | 13            | restrain     | 13            | ledge        | 12            |
| concern     | 13            | royal        | 13            | local        | 12            |
| consider    | 13            | secretary    | 13            | machine      | 12            |
| contract    | 13            | spell        | 13            | majority     | 12            |
| crowd       | 13            | stone        | 13            | mayor        | 12            |
| dash        | 13            | summon       | 13            | measure      | 12            |
| debate      | 13            | testimony    | 13            | mountain     | 12            |
| decision    | 13            | track        | 13            | national     | 12            |
| degree      | 13            | travel       | 13            | official     | 12            |
| department  | 13            | victim       | 13            | organize     | 12            |
| diamond     | 13            | accident     | 12            | page         | 12            |
| difficulty  | 13            | addition     | 12            | particular   | 12            |
| discussion  | 13            | adopt        | 12            | point        | 12            |
| district    | 13            | army         | 12            | population   | 12            |
| elaborate   | 13            | assist       | 12            | pound        | 12            |



|             |    |           |    |          |               |
|-------------|----|-----------|----|----------|---------------|
| practical   | 12 | railroad  | 12 | term     | 12            |
| president   | 12 | recommend | 12 | town     | 12            |
| print       | 12 | recover   | 12 | treasure | 12            |
| private     | 12 | reference | 12 | vessel   | 12            |
| property    | 12 | senate    | 12 | volume   | 12            |
| publication | 12 | serious   | 12 | wire     | 12            |
| publish     | 12 | ship      | 12 | witness  | 12            |
| purpose     | 12 | steamer   | 12 | wreck    | 12            |
| race        | 12 | support   | 12 |          | <u>91,899</u> |

### CO-OPERATION OF CITY SUPERINTENDENTS

When the 1,000 words had been selected, letters were written to city superintendents of schools throughout the country asking if they would co-operate in the work by having lists of 20 words each given as spelling tests in all the grades of their school systems from the second through the eighth. Almost without exception they generously agreed to undertake this part of the work, and satisfactory returns were finally secured from the following 84 cities:

|                    |                         |
|--------------------|-------------------------|
| Akron, Ohio        | Cedar Rapids, Iowa      |
| Albany, N. Y.      | Chicopee, Mass.         |
| Asbury Park, N. J. | Colorado Springs, Colo. |
| Atlanta, Ga.       | Columbus, Ohio          |
| Auburn, N. Y.      | Covington, Ky.          |
| Augusta, Ga.       | Cripple Creek, Colo.    |
| Bangor, Me.        | Cumberland, Md.         |
| Bay City, Mich.    | Danville, Ill.          |
| Bayonne, N. J.     | Denver, Colo.           |
| Boise, Idaho       | Des Moines, Iowa        |
| Bridgeport, Ct.    | Detroit, Mich.          |
| Brockton, Mass.    | Dubuque, Iowa           |
| Burlington, Vt.    | Duluth, Minn.           |

|                     |                       |
|---------------------|-----------------------|
| East Orange, N. J.  | Nashua, N. H.         |
| Elizabeth, N. J.    | New Bedford, Mass.    |
| Evanston, Ill.      | New Orleans, La.      |
| Evansville, Ind.    | Newport, Ky.          |
| Fall River, Mass.   | Newport, R. I.        |
| Fitchburg, Mass.    | Newton, Mass.         |
| Fort Wayne, Ind.    | Oklahoma City, Okla.  |
| Galesburg, Ill.     | Oshkosh, Wis.         |
| Grand Rapids, Mich. | Passaic, N. J.        |
| Greenwich, Ct.      | Pittsburg, Pa.        |
| Harrisburg, Pa.     | Plainfield, N. J.     |
| Haverhill, Mass.    | Portland, Me.         |
| Indianapolis, Ind.  | Raleigh, N. C.        |
| Jackson, Mich.      | Reading, Pa.          |
| Jersey City, N. J.  | Richmond, Ind.        |
| Joliet, Ill.        | Richmond, Va.         |
| Kalamazoo, Mich.    | St. Joseph, Mo.       |
| Kenosha, Wis.       | Schenectady, N. Y.    |
| Lawrence, Mass.     | Somerville, Mass.     |
| Lewiston, Me.       | South Bend, Ind.      |
| Louisville, Ky.     | South Manchester, Ct. |
| Manchester, N. H.   | Springfield, Mass.    |
| Michigan City, Ind. | Syracuse, N. Y.       |
| Middletown, Ct.     | Terre Haute, Ind.     |
| Minneapolis, Minn.  | Trenton, N. J.        |
| Mobile, Ala.        | Utica, N. Y.          |
| Montclair, N. J.    | Waltham, Mass.        |
| Muncie, Ind.        | Woonsocket, R. I.     |
| Muskegon, Mich.     | Worcester, Mass.      |

### GIVING THE TESTS

The 1,000 words were first made up into 50 lists of 20 words each and these lists were given as dictated spelling tests. Each list of words was first spelled by the children of two consecutive grades in a number of cities. The work was done at the mid-point of the school year and so arranged in each case as to test the spelling attainment of the children

who had completed just half the work of each grade. Where words have more than one meaning for the same pronunciation, the meaning desired was indicated by giving a short illustrative sentence.

As a control and check, words were next taken from each of the 50 lists and recombined in new sets of 20 words each and sent out as tests in each of four consecutive grades in the different cities. These two sets of testing were continued until an aggregate of 1,400,000 spellings had been secured from 70,000 children in 84 cities. The results constitute the basis of the present scale.

### PROBLEMS IN SCALE MAKING

To be both valid and convenient, a scale for measuring attainment in spelling should consist of a series of groups of words so arranged that all the words in each group are of equal spelling difficulty, and with the group so arranged that the step in spelling difficulty from any one group to the next higher group will be equal to any other step on the scale from one group to the next higher group.

In the present work, words have been considered as of equal spelling difficulty if they are correctly spelled by an equal proportion

of children who have had the same amount of training in spelling, which is to say, by children of the same school grade. It is essential that the words should be of equal difficulty in order to avoid the defect of the ordinary schoolroom test in spelling in which words of greatly varying difficulty are put together in a single 10 or 20 word spelling list, and the pupils' papers marked by taking 10 or 5 points off for each word misspelled. The assumption in such a test is that all the words are equally difficult, whereas this is almost never even approximately true.

The reason why words have been rated as of equal difficulty for given grades in the present study is that it has been found impossible to group them as of equal difficulty for people in general or for school children in general. This is because the easier words are of no difficulty at all for pupils who have had much training, while the same words are of real and varying difficulty for those who have had little training. Similarly, harder words may be of absolute difficulty for children of the lower grades, while they are of varying degrees of difficulty for those of the upper grades. Hence, words can be grouped as of equal difficulty only when we find that they

are of equal difficulty for people who have had equal amounts of training; for example, school children of a given grade. Moreover, a valid scale should embrace only words that are normally within the usual writing vocabularies of the children, for otherwise words will be rated as of high degrees of difficulty which are in reality simply unusual. This consideration has been cared for in the present work by confining the entire study to the most commonly used words.

#### LOCATING THE EQUAL STEPS ON THE SCALE

After the degree of difficulty of each word for pupils of a given grade had been ascertained by finding what per cent of the pupils could spell it correctly, the next problem was to arrange the words in groups which should be of such progressive degrees of difficulty that all the steps in difficulty from one group to the next, to the next, and so on, should be equal steps. It was necessary to insure that the words in the second group should be as much harder than those in the first, as those in the third were harder than those in the second, and so on for all the successive groups of the scale. The final purpose was to locate these

groups at equally spaced steps on a scale from 0 to 100.

The method employed in locating the equal steps on the scale was based on the assumption that spelling ability conforms in general to what is known as the normal distribution.

### SPELLING ABILITY AND THE NORMAL DISTRIBUTION

This assumption is based on the well known principle that intellectual abilities are distributed in much the same way among people as are physical traits. Just as there are in a normal population very few dwarfs, many people of about medium height, and very few giants, so there are very few exceedingly poor spellers, many medium ones, and very few truly excellent ones. That this assumption was valid in the present case will be shown later.

The so-called normal curve illustrating such a distribution is reproduced in Diagram 1. The properties of the normal curve have been most accurately determined. Let us suppose that this represents the distribution of spelling ability among a large number of third grade children.

The area enclosed between the curve and

the base line represents all the children ranged according to spelling ability. At the extreme left the curve is very near the base which indicates the small number of very poor spellers.

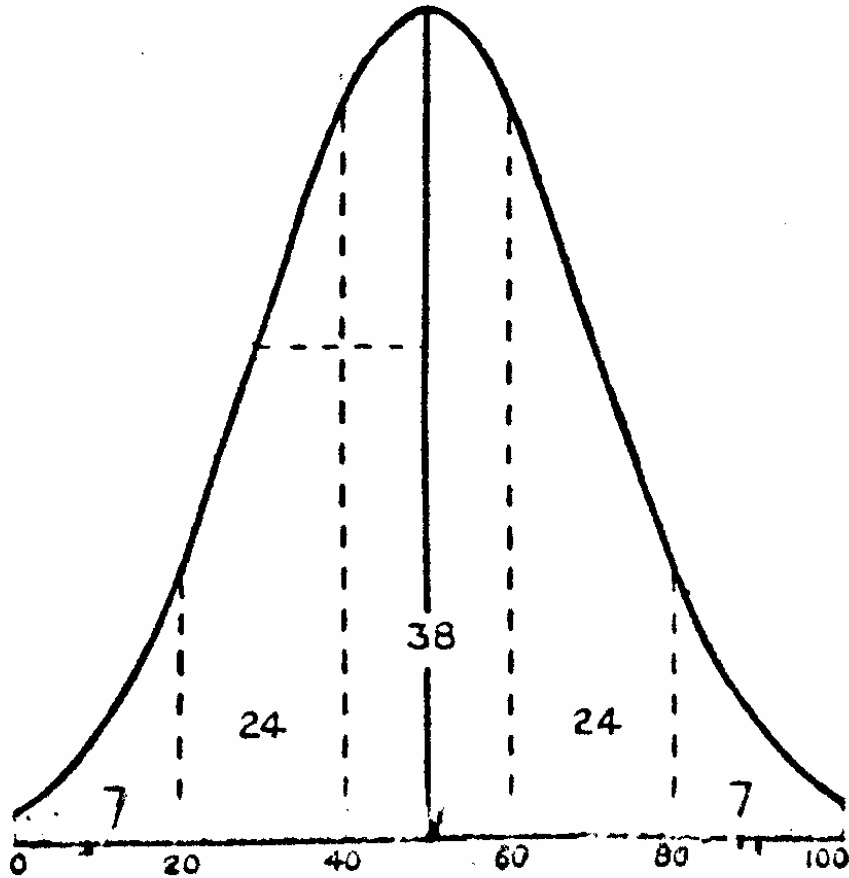


Diagram 1.—Surface of normal distribution with base line five times the sigma distance in length and divided as a scale running from 0 to 100

In the middle the curve is distant from the base representing the large proportion of medium spellers. At the right the curve is again very near the base representing the

small proportion of excellent spellers. The median line at the 50 per cent point represents the average ability.

The dotted horizontal line from the median to the curve represents the sigma distance and intersects the curve at the point at which it changes from convex to concave. This distance is always a constant function of the curve of normal distribution and in the present study has been chosen as the basis of the measurements along the base line. If we lay out on the base a distance equal to this sigma distance and in such a way that it shall extend equally to the left and right of the 50 per cent point where the median bisects the base, its left end will reach the point marked 40 and its right the one marked 60. If now we lay out the same sigma distance two more times to the left, we shall have the points marked 20 and 0, and by doing the same on the right, we shall have the points marked 80 and 100.

In thus dividing the base into five equal parts, each equal to the sigma distance, and calling the extremes 0 and 100, we are taking liberties with the curve of normal distribution for the base and the curves do not actually meet at these points. In theory the two lines are in asymptote and could be indefinitely ex-





tended, always getting nearer together but never touching. In theory about 99.4 per cent of all the cases lie to the right of the point indicated as 0 and some six-tenths of one per cent of them lie to the left. For the purpose of the present study, it has been considered sufficiently accurate to call the point 0 and to assume that all the cases lie to the right. A corresponding assumption is made with respect to the 100 point at the right end of the line.

On the basis of these assumptions, we find that the area of the curve beginning at the left and extending as far as the vertical line at the point 20 is seven per cent of the total. Between this line and the one at point 40 are 24 per cent of the cases, making a total to this point of 31 per cent. From here to point 60 are 38 per cent, making a total from the beginning of 69 per cent. From this point to point 80 are 24 per cent of the cases, making a total of 93 per cent, and from here to 100 are the remaining seven cases.

### SCALING THE WORDS

Now we find that among third grade children in general seven in each 100 fail in the attempt to spell the word *has*, while 93 spell it cor-

rectly. Thus if we imagine the normal curve of Diagram 1 as representing 100 typical third grade children ranked according to spelling ability with the worst at the left and the rest in order of ability to the right, we should find that the line at point 20 would fall at such a place that the seven in the 100 who fail on *has* would be to the left of the line while the 93 who can spell it would be on the right. In a similar way the line at 40 would leave on the left the 31 children who fail on *almost* and on its right the 69 who spell it correctly. By this same method all of the words have been located according to their location on a line representing the distance in spelling difficulty from the word so easy that just all can spell it correctly to the one at the other extreme so difficult that none can quite spell it correctly. This is the line from 0 to 100 difficulty and the words have all been located on it according to equal steps of distance.

In order to do this, each of the five divisions shown on the base line of Diagram 1 has been subdivided into five equal parts, making a total of 25 steps for the entire scale from 0 to 100. The average of all the values that might theoretically be contained in each of these 25 steps has thus been determined to the

nearest whole number and this value has been assigned to the step. These 25 values are 100, 99, 98, 96, 94, 92, 88, 84, 79, 73, 66, 58, 50, 42, 34, 27, 21, 16, 12, 8, 6, 4, 2, 1, 0. They have been used to identify the 25 steps and they indicate the average per cent of correct spellings found among the children of the grade in question, in their spelling of the words placed on the scale at that step. For example, the nine words, *the, in, so, no, now, man, ten, bed, top*, are shown on the scale as at step 94 for the second grade. This indicates that the average per cent correct among second grade attempts to spell these words was 94.

#### COMBINING THE SCALES FOR THE SEVEN GRADES

Since the first data returned by the co-operating school systems consisted of figures showing the number of children succeeding and failing in spelling the words in each of two consecutive grades, it was possible to compute the amount of improvement in spelling the same words from grade to grade. It was possible, that is, to find how much better the third grade children spelled the words than the second grade ones, how much better

records the fourth grade pupils made than did the third grade ones in spelling the same words, and so on for all the grades.

When these figures, showing average improvement from grade to grade, were reduced to terms of the 25-division spelling scale that has been described on page 30, it was found that the improvement of the third grade over the second averaged about three steps; that of the fourth over the third averaged about three steps; and the improvement of each of the other five grades over its preceding grade averaged about two steps.

These computations of the average shift in spelling ability were then checked up by combining with them the data for the sets of words spelled in four consecutive grades and the results remained nearly unchanged. A further check was then made by computing the shift found from grade to grade by Dr. B. R. Buckingham in his study entitled, "Spelling Ability," published in 1913 by Teachers College, Columbia University. A fourth check was made by comparing with these results those reported by Dr. Buckingham for the use of Dr. J. M. Rice's spelling test. The results of the three investigations all reduced to terms of the 25-step scale of

the present study showed average grade shifts as follows:

| Grade      | Ayres | Buckingham | Rice |
|------------|-------|------------|------|
| 2nd to 3rd | 2.9   | 3.2        | ..   |
| 3rd to 4th | 2.9   | 2.9        | ..   |
| 4th to 5th | 1.9   | 1.9        | 2.1  |
| 5th to 6th | 2.2   | 2.2        | 1.8  |
| 6th to 7th | 1.9   | 1.6        | 1.9  |
| 7th to 8th | 2.0   | 2.1        | 2.1  |
| Total      | 13.8  | 13.9       |      |

In view of the supporting evidence offered by these several checks, it was decided to adopt, for combining the several scales into one, shifts in advancing spelling ability from grade to grade as follows: second to third, three steps; third to fourth, three steps; fourth to fifth, two steps; fifth to sixth, two steps; sixth to seventh, two steps; seventh to eighth, two steps.

On this basis the scales for the seven grades were put together, one below the other as illustrated on page 28, so that the third grade scale extends three steps beyond the second grade one; the fourth grade scale is three steps beyond the third grade one; and each of the other scales is located two steps beyond its predecessor.

## TESTING THE LOCATION OF THE WORDS

When the headings representing the seven grade scales were thus superimposed on each other with the appropriate shifts from grade to grade, the 1,000 words were entered in the columns below. Their theoretical spelling difficulty in each grade according to the scales was then compared with their difficulties as indicated by the tests in the 84 cities. The results showed that the conformity was so close that if as many as 10 words in one column were considered as a group, the agreement was nearly exact; that among the individual words the very great majority had classroom records in agreement with their scale locations; and that the words spelled in the classrooms by the greatest numbers of children conformed most exactly. These bits of evidence all point in one direction and that is toward the substantiation of the hypothesis that spelling ability among homogeneous groups of school children approximately conforms to the normal distribution. If it followed some radically differing type of distribution, the several scales could not fit together as they do.

## FINAL ARRANGEMENT OF THE SCALE

In its final arrangement, the scale consists of the seven grade scales so superimposed upon each other as to indicate the approximate shifts from grade to grade and with the 1,000 words entered in 26 columns below. This is shown by the illustration on page 28, which reproduces in miniature the heading of the scale and indicates the columns in which the words are printed in the scale itself. The scale as printed for convenient classroom use is a sheet of paper measuring some 14 by 24 inches with the heading as illustrated on page 28 printed across the top, the 1,000 words entered in the appropriate columns, and the directions for use printed in the lower left hand corner.

In order to facilitate identification and reference, the 26 columns of the scale are designated by the letters from A to Z. The 1,000 words are listed in these columns. In order to complete the record and description as presented in this monograph, these words are published here in Lists B and C beginning on pages 43 and 51 respectively. In List B, the 1,000 words are presented in alphabetic order and beside each is the letter indicating the



column in which that word is found on the scale. In List C, the words are presented in columns from A through Z, just as they are published in the scale in its final form.

All the words in each column of the scale are of approximately equal spelling difficulty. The steps in spelling difficulty from each column to the next are approximately equal steps. The numbers at the top of each column on the scale indicate about what per cent of correct spellings of the words in that column may be expected among the children of the different grades. For example, reference to the scale headings as reproduced on page 28 and the words of column H as printed beginning on page 51 will show that if 20 words from this column are given as a spelling test, it may be expected that the average score for an entire second grade spelling them will be about 79 per cent. This will be more clearly understood by referring to the scale as printed on the large sheet for classroom use. The average score for an entire third grade taking the same tests should be about 92 per cent, for a fourth grade about 98 per cent, and for a fifth grade about 100 per cent.

The limits of the groups are as follows: 50 means from 46 through 54 per cent; 58 means

from 55 through 62 per cent; 66 means from 63 through 69 per cent; 73 means from 70 through 76 per cent; 79 means from 77 through 81 per cent; 84 means from 82 through 86 per cent; 88 means from 87 through 90 per cent; 92 means from 91 through 93 per cent; 94 means 94 and 95 per cent; 96 means 96 and 97 per cent; while 98, 99, and 100 per cent are separate groups.

By means of these groupings, a child's spelling ability may be located in terms of grades. Thus, if a child were given a 20 word spelling test from the words of column 0 and spelled 15 words, or 75 per cent of them, correctly, it would be proper to say that he showed fourth grade spelling ability. If he spelled correctly 17 words, or 85 per cent, he would show fifth grade ability, and so on.

All of the scales have been arbitrarily cut off at 50 per cent, partly because it is doubtful whether any useful teaching purpose is served by testing children on words of which they cannot spell more than 50 per cent correctly, and partly because children of the lower grades attempting to spell difficult words frequently fail, not because of the inherent difficulty of the spelling, but because the word form is not yet definitely a part of the chil-

dren's regular vocabulary. Thus the record in spelling these words becomes unreliable and it was considered wisest to omit from the scale the numbers showing the scores which children spelling such words would make.

### LENGTH OF WORDS AND SPELLING DIFFICULTY

A mere inspection of the scale shows that practically all of the easier words in the first columns are monosyllables. In the middle of the scale are many words of medium difficulty and medium length. At the right hand are found words of greater difficulty and greater length. Thus it is clear that there is a considerable positive correlation between length and difficulty. If we consider the respective difficulties of the words in the 26 columns as being represented by consecutive numbers running from 1 to 26 and compute the correlation between these difficulties and the lengths of the words in these columns, we get a Pearson coefficient of correlation of .734. This close relationship between the length of the words and their difficulty is probably to be accounted for in part by the fact that mere length tends to increase spelling difficulty and

in addition, the longer the word is, the more opportunities it presents for difficult combinations of letters and difficulties arising through inaccurate pronunciation. The correlation between the spelling difficulties and the lengths of the words, computed by the Spearman method, gives a coefficient of .882, while the percentage of unlike signed pairs gives a coefficient of .767 and Galton's graphic method one of .78.

### USE AND LIMITATIONS

The scale that has been produced by this study should be found useful in three ways. In the first place, it consists of a list of 1,000 words which probably constitute a most valuable foundation spelling vocabulary.

In the second place, these words are presented in the final scale in groups of approximately equal spelling difficulty. These groups, which are also printed as List C of the present publication, furnish more reliable material for spelling tests than has heretofore been available. This is because the words of each list are of nearly equal difficulty and hence in using them in spelling tests all of the units of the test are of nearly equal value.

In the third place, the scale is so arranged as to indicate about what percentage of children in the several grades in cities throughout the country succeed in spelling the words correctly. By means of these standards children of the different grades in any locality may be tested as to their spelling attainment and the results compared with those which are found in the corresponding grades in city systems in general. When such tests are made of the spelling attainment of large numbers of children in the different grades in any one locality, the results may be compared with considerable reliability with those here presented for the 84 cities which co-operated in the present study. With less reliability the attainment of a smaller number of grades or of one grade may be tested. With still less reliability the attainment of a single child may be compared with these average results.

In all such testing it must be remembered that the present scale or any scale for measuring spelling attainment will become increasingly and rapidly less reliable for measuring purposes as the children become more accustomed to spelling these particular words. In proportion as these lists are used for the purposes of classroom drill, the scale will become

untrustworthy as a measuring instrument. Probably the scale will have served its greatest usefulness in any locality when the school children have mastered these 1,000 words so thoroughly that the scale has become quite useless as a measuring instrument.

**LIST B. THE THOUSAND WORDS ARRANGED IN ALPHABETIC ORDER. THE LETTERS INDICATE THE COLUMNS IN WHICH THE WORDS ARE LOCATED IN THE FINAL SCALE**

|           |   |             |   |            |   |
|-----------|---|-------------|---|------------|---|
| a         | C | already     | R | assure     | U |
| able      | L | also        | M | at         | B |
| aboard    | O | although    | Q | athletic   | W |
| about     | H | always      | N | attempt    | Q |
| above     | L | am          | E | attend     | O |
| absence   | T | among       | N | attention  | R |
| accept    | T | amount      | P | August     | O |
| accident  | T | an          | E | aunt       | N |
| according | R | and         | B | auto       | P |
| account   | M | annual      | X | automobile | T |
| across    | K | another     | L | avenue     | R |
| act       | N | answer      | P | await      | Q |
| action    | Q | any         | K | away       | I |
| add       | I | anything    | L | awful      | P |
| addition  | Q | anyway      | M | baby       | H |
| address   | O | appear      | O | back       | I |
| adopt     | R | application | U | bad        | E |
| affair    | S | appoint     | Q | ball       | H |
| afraid    | O | appreciate  | W | band       | J |
| after     | I | April       | N | be         | F |
| afternoon | K | are         | G | bear       | K |
| again     | M | argument    | T | beautiful  | P |
| against   | R | army        | M | became     | K |
| age       | J | around      | K | because    | L |
| ago       | E | arrange     | Q | become     | K |
| agreement | U | arrangement | V | bed        | D |
| air       | J | arrest      | Q | been       | N |
| alike     | I | arrive      | S | before     | L |
| all       | F | article     | R | beg        | P |
| allege    | Z | as          | H | began      | L |
| allow     | Q | ask         | H | begin      | M |
| almost    | M | assist      | S | beginning  | U |
| alone     | L | associate   | T | begun      | M |
| along     | J | association | V | behind     | K |

|          |   |              |   |               |   |
|----------|---|--------------|---|---------------|---|
| believe  | S | carry        | N | complete      | R |
| belong   | H | case         | M | concern       | T |
| beside   | M | cast         | J | condition     | S |
| best     | I | catch        | L | conference    | T |
| better   | K | cause        | N | connection    | Q |
| between  | O | celebration  | T | consider      | R |
| big      | G | cent         | K | consideration | U |
| bill     | J | center       | N | contain       | O |
| black    | L | century      | S | contract      | M |
| block    | I | certain      | S | convenient    | X |
| blow     | I | chain        | N | convention    | R |
| blue     | J | change       | M | convict       | Q |
| board    | O | character    | W | copy          | N |
| boat     | J | charge       | M | cordially     | W |
| body     | L | check        | N | cost          | K |
| book     | F | chief        | O | could         | K |
| born     | M | child        | G | country       | L |
| both     | M | children     | M | course        | S |
| bought   | M | Christmas    | R | court         | N |
| box      | H | church       | L | cover         | J |
| boy      | F | circular     | T | crowd         | Q |
| bridge   | N | circumstance | U | cut           | I |
| bring    | H | cities       | P | dark          | J |
| broke    | N | citizen      | U | dash          | L |
| brother  | K | city         | K | date          | L |
| brought  | M | claim        | Q | daughter      | P |
| build    | M | class        | K | day           | H |
| bullt    | N | clean        | K | dead          | L |
| burn     | K | clear        | K | deal          | M |
| business | T | clerk        | P | dear          | I |
| busy     | R | close        | L | death         | N |
| but      | F | clothing     | L | debate        | Q |
| buy      | L | club         | K | December      | N |
| by       | G | cold         | G | decide        | T |
| call     | H | collect      | M | decision      | Y |
| came     | I | colonies     | U | declare       | Q |
| camp     | K | combination  | R | deep          | J |
| can      | C | come         | G | degree        | P |
| cannot   | J | comfort      | O | delay         | K |
| capture  | N | coming       | K | department    | P |
| car      | J | command      | Q | desire        | P |
| card     | J | committee    | X | destroy       | ' |
| care     | K | common       | R | develop       | U |
| career   | V | company      | O | diamond       | R |
| carried  | P | complaint    | P | did           | F |



|             |   |             |   |          |   |
|-------------|---|-------------|---|----------|---|
| died        | M | emergency   | W | favor    | P |
| difference  | S | empire      | P | feature  | R |
| different   | R | employ      | Q | February | W |
| difficulty  | U | enclose     | Q | feel     | N |
| direct      | O | end         | I | feet     | I |
| direction   | Q | engage      | Q | fell     | L |
| director    | R | engine      | P | felt     | K |
| disappoint  | X | enjoy       | P | few      | M |
| discussion  | V | enough      | O | field    | Q |
| distinguish | U | enter       | M | fifth    | N |
| distribute  | R | entertain   | R | fight    | L |
| district    | O | entire      | Q | figure   | O |
| divide      | U | entitle     | T | file     | M |
| do          | A | entrance    | P | fill     | J |
| doctor      | N | escape      | P | final    | Q |
| does        | P | especially  | X | finally  | U |
| dollar      | N | estate      | Q | find     | I |
| done        | L | estimate    | T | fine     | J |
| don't       | O | even        | K | finish   | K |
| door        | H | evening     | N | fire     | J |
| doubt       | S | event       | M | firm     | Q |
| down        | J | ever        | L | first    | K |
| dozen       | N | every       | J | five     | H |
| dress       | M | everything  | O | fix      | M |
| drill       | M | evidence    | V | flight   | P |
| driven      | M | examination | S | flower   | L |
| drown       | R | except      | N | folks    | T |
| due         | Q | expect      | N | follow   | M |
| during      | O | expense     | U | foot     | I |
| duty        | O | experience  | V | for      | H |
| each        | I | express     | L | foreign  | U |
| earliest    | U | extra       | M | forenoon | R |
| early       | L | extreme     | W | forget   | J |
| east        | J | eye         | K | form     | I |
| easy        | K | face        | I | fortune  | P |
| eat         | H | fact        | O | forty    | O |
| education   | R | factory     | Q | forward  | Q |
| effect      | R | fail        | K | found    | J |
| effort      | Q | fair        | N | four     | L |
| eight       | O | fall        | I | fourth   | O |
| either      | Q | family      | P | free     | I |
| elaborate   | U | famous      | Q | Friday   | K |
| elect       | O | far         | I | friend   | O |
| election    | P | farther     | O | from     | J |
| else        | N | father      | L | front    | N |

|            |   |             |   |          |   |
|------------|---|-------------|---|----------|---|
| full       | K | herself     | L | is       | C |
| further    | S | high        | L | issue    | U |
| game       | J | him         | F | it       | C |
| gave       | I | himself     | N | its      | I |
| general    | R | his         | H | itself   | N |
| gentleman  | Q | history     | N | jail     | O |
| get        | H | hold        | M | January  | N |
| getting    | O | home        | H | judge    | O |
| girl       | J | honor       | R | judgment | Z |
| give       | I | hope        | J | July     | K |
| glad       | J | horse       | K | June     | L |
| glass      | K | hot         | G | just     | H |
| go         | B | hour        | K | justice  | Q |
| God        | N | house       | H | keep     | K |
| goes       | M | how         | H | kill     | G |
| gold       | J | however     | L | kind     | J |
| gone       | L | human       | P | knew     | O |
| good       | E | hurt        | K | know     | L |
| got        | I | husband     | P | known    | P |
| government | S | I           | H | lady     | K |
| grand      | J | ice         | G | lake     | I |
| grant      | L | if          | H | land     | G |
| great      | M | illustrate  | R | large    | J |
| ground     | L | immediate   | X | last     | E |
| guess      | T | importance  | P | late     | G |
| guest      | P | important   | Q | law      | H |
| had        | G | impossible  | T | lay      | H |
| half       | L | imprison    | Q | lead     | L |
| hand       | G | improvement | S | learn    | N |
| happen     | M | in          | D | least    | N |
| happy      | J | include     | Q | leave    | L |
| hard       | J | income      | M | led      | H |
| has        | H | increase    | R | ledge    | Q |
| hat        | G | indeed      | L | left     | J |
| have       | G | inform      | M | length   | P |
| he         | E | information | Q | less     | M |
| head       | K | injure      | R | lesson   | L |
| hear       | N | inside      | J | let      | G |
| heard      | N | inspect     | N | letter   | I |
| heart      | M | instead     | O | liberty  | O |
| height     | V | intend      | O | life     | J |
| held       | L | interest    | R | light    | K |
| help       | J | into        | F | like     | F |
| her        | H | investigate | S | line     | J |
| here       | J | invitation  | T | list     | L |

little  
 live  
 local  
 long  
 look  
 lose  
 loss  
 lost  
 lot  
 love  
 low  
 machine  
 madam  
 made  
 mail  
 majority  
 make  
 man  
 manner  
 many  
 March  
 marriage  
 material  
 matter  
 May  
 may  
 maybe  
 mayor  
 me  
 mean  
 meant  
 measure  
 meet  
 member  
 men  
 mention  
 mere  
 might  
 mile  
 mind  
 mine  
 minute  
 Miss  
 miss  
 Monday

E money  
 G month  
 S more  
 H morning  
 F most  
 R mother  
 P motion  
 J mountain  
 H move  
 H Mr.  
 H Mrs.  
 R much  
 O must  
 J my  
 K name  
 U national  
 G navy  
 D near  
 R nearly  
 L necessary  
 L need  
 S neighbor  
 U neither  
 N never  
 J new  
 F news  
 K newspaper  
 P next  
 A nice  
 N night  
 U nine  
 Q no  
 L none  
 M noon  
 H nor  
 S north  
 U not  
 M nothing  
 K November  
 L now  
 J number  
 T object  
 M objection  
 I oblige  
 I obtain

M occupy  
 M o'clock  
 J October  
 L of  
 J off  
 G offer  
 S office  
 M official  
 K often  
 I old  
 P omit  
 H on  
 G once  
 E one  
 J only  
 T open  
 O opinion  
 J or  
 P order  
 U organization  
 N organize  
 R other  
 S ought  
 J our  
 I out  
 L outside  
 P over  
 L own  
 I page  
 K paid  
 I pair  
 D paper  
 O part  
 J particular  
 N party  
 I pass  
 E past  
 L pay  
 N people  
 D perfect  
 N perhaps  
 R period  
 O person  
 P personal  
 P picture

U  
 P  
 N  
 F  
 M  
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 T  
 S  
 E  
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 B  
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 M

piece  
 place  
 plan  
 plant  
 play  
 pleasant  
 please  
 pleasure  
 point  
 police  
 political  
 poor  
 popular  
 population  
 position  
 possible  
 post  
 pound  
 power  
 practical  
 prefer  
 preliminary  
 prepare  
 present  
 president  
 press  
 pretty  
 price  
 primary  
 principal  
 principle  
 print  
 prison  
 private  
 probably  
 proceed  
 progress  
 promise  
 prompt  
 proper  
 property  
 prove  
 provide  
 provision  
 public

S publication  
 J publish  
 N purpose  
 I push  
 G put  
 S question  
 M quite  
 O race  
 L railroad  
 O rain  
 T raise  
 K ran  
 R rapid  
 O rate  
 Q rather  
 S reach  
 J read  
 K ready  
 L real  
 W really  
 R reason  
 X receipt  
 R receive  
 Q recent  
 Q recommend  
 N recover  
 M red  
 K refer  
 Q reference  
 V refuse  
 Y regard  
 J region  
 P relative  
 Q relief  
 U remain  
 W remember  
 Q repair  
 R reply  
 Q report  
 O represent  
 Q request  
 N respectfully  
 M responsible  
 R rest  
 O restrain

R result  
 Q retire  
 R return  
 L ride  
 I right  
 N ring  
 O river  
 J road  
 M room  
 K round  
 O royal  
 H rule  
 P run  
 O running  
 O said  
 K sail  
 J salary  
 M same  
 M Saturday  
 T saw  
 N say  
 X says  
 U scene  
 T school  
 Z sea  
 M search  
 E second  
 T secretary  
 V section  
 O secure  
 P see  
 Q seem  
 Q seen  
 U select  
 O senate  
 Q send  
 P sent  
 P separate  
 J September  
 Q serious  
 O serve  
 U service  
 U session  
 J set  
 O seven

Q  
 O  
 M  
 I  
 L  
 G  
 I  
 L  
 J  
 K  
 O  
 N  
 C  
 Q  
 J  
 P  
 R  
 J  
 Q  
 J  
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 G  
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 Q  
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 J

several  
 shall  
 she  
 shed  
 ship  
 short  
 should  
 show  
 shut  
 sick  
 side  
 sight  
 since  
 sincerely  
 sir  
 sister  
 sit  
 six  
 size  
 slide  
 small  
 so  
 soap  
 soft  
 sold  
 some  
 something  
 sometimes  
 son  
 song  
 soon  
 sorry  
 south  
 speak  
 special  
 spell  
 spend  
 spent  
 spring  
 stamp  
 stand  
 start  
 state  
 statement  
 station

P stay  
 L steamer  
 C still  
 O stole  
 J stone  
 K stood  
 K stop  
 I stopped  
 K story  
 I street  
 J struck  
 M study  
 P subject  
 W success  
 K such  
 J sudden  
 H suffer  
 F suggest  
 N suit  
 O summer  
 L summon  
 D Sunday  
 L supply  
 H support  
 I suppose  
 H sure  
 N surprise  
 Q system  
 J table  
 I take  
 I talk  
 N tax  
 J teach  
 M teacher  
 Q tell  
 K ten  
 P tenth  
 I term  
 I terrible  
 K testimony  
 H than  
 K thank  
 K that  
 Q the  
 O theater

J their  
 M them  
 J themselves  
 M then  
 I there  
 M therefore  
 L these  
 S they  
 K thing  
 G think  
 O third  
 N this  
 N those  
 R though  
 L thought  
 O three  
 N through  
 U throw  
 L Thursday  
 L thus  
 T ticket  
 I time  
 S tire  
 P to  
 Q today  
 N together  
 Q told  
 S tomorrow  
 L tonight  
 I too  
 L took  
 N top  
 M total  
 N toward  
 H town  
 D track  
 K train  
 Q travel  
 Q treasure  
 V tree  
 I trip  
 I trouble  
 H true  
 D truly  
 S trust

Q  
 H  
 Q  
 H  
 N  
 S  
 K  
 K  
 I  
 J  
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 F  
 M  
 P  
 N  
 G  
 O  
 O  
 O  
 N  
 M  
 F  
 N  
 H  
 F  
 R  
 I  
 R  
 K  
 S  
 M  
 D  
 S  
 R  
 J  
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 J  
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 M  
 O  
 M

try  
 Tuesday  
 turn  
 two  
 unable  
 uncle  
 under  
 understand  
 unfortunate  
 unless  
 until  
 up  
 upon  
 us  
 use  
 usual  
 vacation  
 various  
 very  
 vessel  
 victim  
 view  
 visit  
 visitor  
 volume  
 vote  
 wait  
 walk  
 want  
 war

K warm  
 O was  
 L watch  
 K water  
 M way  
 O we  
 J wear  
 M weather  
 U Wednesday  
 L week  
 O weigh  
 E well  
 K went  
 E were  
 N west  
 P what  
 P when  
 T where  
 I whether  
 R which  
 T while  
 P white  
 P who  
 R whole  
 T whom  
 N whose  
 P why  
 L wife  
 J will  
 L

L wind  
 H winter  
 L wire  
 K wish  
 H with  
 E within  
 R without  
 O witness  
 T woman  
 K women  
 R wonder  
 H wonderful  
 I word  
 L work  
 I world  
 I worth  
 J would  
 K wreck  
 U write  
 P written  
 M wrote  
 I yard  
 M year  
 O yes  
 Q yesterday  
 Q yet  
 J you  
 K young  
 E your

J  
 I  
 M  
 L  
 J  
 L  
 K  
 S  
 N  
 Q  
 N  
 Q  
 J  
 J  
 L  
 O  
 K  
 R  
 N  
 Q  
 N  
 H  
 H  
 H  
 N  
 I  
 E  
 N  
 F

**LIST C. THE THOUSAND WORDS ARRANGED IN THE ORDER IN WHICH THEY APPEAR IN THE FINAL SCALE. THE TWENTY-SIX GROUPS GIVEN HERE UNDER THE LETTERS FROM A TO Z ARE PRINTED UNDER THE SAME LETTERS ON THE SCALE**

|          |          |          |       |
|----------|----------|----------|-------|
| <b>A</b> | an       | are      | stand |
| me       | my       | had      | yard  |
| do       | up       | over     | bring |
|          | last     | must     | tell  |
|          | not      | make     | five  |
| <b>B</b> | us       | school   | ball  |
| and      | am       | street   | law   |
| go       | good     | say      | ask   |
| at       | little   | come     | just  |
| on       | ago      | hand     | way   |
|          | old      | ring     | get   |
|          | bad      | live     | home  |
| <b>C</b> | red      | kill     | much  |
| a        |          | late     | call  |
| it       | <b>F</b> | let      | long  |
| is       | of       | big      | love  |
| she      | be       | mother   | then  |
| can      | but      | three    | house |
| see      | this     | land     | year  |
| run      | all      | cold     | to    |
|          | your     | hot      | I     |
| <b>D</b> | out      | hat      | as    |
| the      | time     | child    | send  |
| in       | may      | ice      | one   |
| so       | into     | play     | has   |
| no       | him      | sea      | some  |
| now      | today    | <b>H</b> | if    |
| man      | look     | day      | how   |
| ten      | did      | eat      | her   |
| bed      | like     | sit      | them  |
| top      | six      | lot      | other |
|          | boy      | box      | baby  |
|          | book     | belong   | well  |
| <b>E</b> |          | door     | about |
| he       | <b>G</b> | yes      | men   |
| you      | by       | low      | for   |
| will     | have     | soft     | ran   |
| we       |          |          | was   |
|          |          |          | that  |

his  
led  
lay

I  
nine  
face  
miss  
ride  
tree  
sick  
got  
north  
white  
spent  
foot  
blow  
block  
spring  
river  
plant  
cut  
song  
winter  
stone  
free  
lake  
page  
nice  
end  
fall  
feet  
went  
back  
away  
paper  
put  
each  
soon  
came  
Sunday  
show  
Monday  
yet  
find

give  
new  
letter  
take  
Mr.  
after  
thing  
what  
than  
its  
very  
or  
thank  
dear  
west  
sold  
told  
best  
form  
far  
gave  
alike  
add

J  
seven  
forget  
happy  
noon  
think  
sister  
cast  
card  
south  
deep  
inside  
blue  
post  
town  
stay  
grand  
outside  
dark  
band  
game

boat  
rest  
east  
son  
help  
hard  
race  
cover  
fire  
age  
gold  
read  
fine  
cannot  
May  
line  
left  
ship  
train  
saw  
pay  
large  
near  
down  
why  
bill  
want  
girl  
part  
still  
place  
report  
never  
found  
side  
kind  
life  
here  
car  
word  
every  
under  
most  
made  
said

work  
our  
more  
when  
from  
wind  
print  
air  
fill  
along  
lost  
name  
room  
hope  
same  
glad  
with  
mine

K  
became  
brother  
rain  
keep  
start  
mail  
eye  
glass  
party  
upon  
two  
they  
would  
any  
could  
should  
city  
only  
where  
week  
first  
sent  
mile  
seem  
even



without  
afternoon  
Friday  
hour  
wife  
state  
July  
head  
story  
open  
short  
lady  
reach  
better  
water  
round  
cost  
price  
become  
class  
horse  
care  
try  
move  
delay  
pound  
behind  
around  
burn  
camp  
bear  
clear  
clean  
spell  
poor  
finish  
hurt  
maybe  
across  
tonight  
tenth  
sir  
these  
club  
seen

felt  
full  
fail  
set  
stamp  
light  
coming  
cent  
night  
pass  
shut  
easy

L

catch  
black  
warm  
unless  
clothing  
began  
able  
gone  
sult  
track  
watch  
dash  
fell  
fight  
buy  
stop  
walk  
grant  
soap  
news  
small  
war  
summer  
above  
express  
turn  
lesson  
half  
father  
anything  
table

high  
talk  
June  
right  
date  
road  
March  
next  
indeed  
four  
herself  
power  
wish  
because  
world  
country  
meet  
another  
trip  
list  
people  
ever  
held  
church  
once  
own  
before  
know  
were  
dead  
leave  
early  
close  
flower  
nothing  
ground  
lead  
such  
many  
morning  
however  
mind  
shall  
alone  
order

third  
push  
point  
within  
done  
body

M

trust  
extra  
dress  
beside  
teach  
happen  
begun  
collect  
file  
provide  
sight  
stood  
fix  
born  
goes  
hold  
drill  
army  
pretty  
stole  
income  
bought  
paid  
enter  
railroad  
unable  
ticket  
account  
driven  
real  
recover  
mountain  
steamer  
speak  
past  
might  
begin

contract  
deal  
almost  
brought  
less  
event  
off  
true  
took  
again  
inform  
both  
heart  
month  
children  
build  
understand  
follow  
charge  
says  
member  
case  
while  
also  
return  
those  
office  
great  
Miss  
who  
died  
change  
wire  
few  
please  
picture  
money  
ready  
omit  
anyway

**N**

except  
aunt  
capture

wrote  
else  
bridge  
offer  
suffer  
built  
center  
front  
rule  
carry  
chain  
death  
learn  
wonder  
tire  
pair  
check  
prove  
heard  
inspect  
itself  
always  
something  
write  
expect  
need  
thus  
woman  
young  
fair  
dollar  
evening  
plan  
broke  
feel  
sure  
least  
sorry  
press  
God  
teacher  
November  
subject  
April  
history

cause  
study  
himself  
matter  
use  
thought  
person  
nor  
January  
mean  
vote  
court  
copy  
act  
been  
yesterday  
among  
question  
doctor  
hear  
size  
December  
dozen  
there  
tax  
number  
October  
reason  
fifth

**O**

eight  
afraid  
uncle  
rather  
comfort  
elect  
aboard  
jail  
shed  
retire  
refuse  
district  
restrain  
royal

objection  
pleasure  
navy  
fourth  
population  
proper  
judge  
weather  
worth  
contain  
figure  
sudden  
forty  
instead  
throw  
personal  
everything  
rate  
chief  
perfect  
second  
slide  
farther  
duty  
intend  
company  
quite  
none  
knew  
remain  
direct  
appear  
liberty  
enough  
fact  
board  
September  
station  
attend  
between  
public  
friend  
during  
through  
police

until  
madam  
truly  
whole  
address  
request  
raise  
August  
Tuesday  
struck  
getting  
don't  
Thursday

**P**

spend  
enjoy  
awful  
usual  
complaint  
auto  
vacation  
beautiful  
flight  
travel  
rapid  
repair  
trouble  
entrance  
importance  
carried  
loss  
fortune  
empire  
mayor  
wait  
beg  
degree  
prison  
engine  
visit  
guest  
department  
obtain  
family

favor  
Mrs.  
husband  
amount  
human  
view  
election  
clerk  
though  
o'clock  
support  
does  
regard  
escape  
since  
which  
length  
destroy  
newspaper  
daughter  
answer  
reply  
oblige  
sail  
cities  
known  
several  
desire  
nearly

**Q**

sometimes  
declare  
engage  
final  
terrible  
surprise  
period  
addition  
employ  
property  
select  
connection  
firm  
region

convict  
private  
command  
debate  
crowd  
factory  
publish  
represent  
term  
section  
relative  
progress  
entire  
president  
measure  
famous  
serve  
estate  
remember  
either  
effort  
important  
due  
include  
running  
allow  
position  
field  
ledge  
claim  
primary  
result  
Saturday  
appoint  
information  
whom  
arrest  
themselves  
special  
women  
present  
action  
justice  
gentleman  
enclose

await  
suppose  
wonderful  
direction  
forward  
although  
prompt  
attempt  
whose  
statement  
perhaps  
their  
imprison  
written  
arrange

**R**

forenoon  
lose  
combination  
avenue  
neighbor  
weigh  
wear  
entertain  
salary  
visitor  
publication  
machine  
toward  
success  
drown  
adopt  
secure  
honor  
promise  
wreck  
prepare  
vessel  
busy  
prefer  
illustrate  
different  
object  
provision

according  
already  
attention  
education  
director  
purpose  
common  
diamond  
together  
convention  
increase  
manner  
feature  
article  
service  
injure  
effect  
distribute  
general  
tomorrow  
consider  
against  
complete  
search  
treasure  
popular  
Christmas  
interest

**S**

often  
stopped  
motion  
theater  
improvement  
century  
total  
mention  
arrive  
supply  
assist  
difference  
examination  
particular  
affair

course  
neither  
local  
marriage  
further  
serious  
doubt  
condition  
government  
opinion  
believe  
system  
possible  
piece  
certain  
witness  
investigate  
therefore  
too  
pleasant

**T**

guess  
circular  
argument  
volume  
organize  
summon  
official  
victim  
estimate  
accident  
invitation  
accept  
impossible  
concern  
associate  
automobile  
various  
decide  
entitle  
political  
national  
recent  
business

refer  
minute  
ought  
absence  
conference  
Wednesday  
really  
celebration  
folks

**U**

meant  
earliest  
whether  
distinguish  
consideration  
colonies  
assure  
relief  
occupy  
probably  
foreign  
expense  
responsible  
beginning  
application  
difficulty  
scene  
finally  
develop  
circumstance  
issue  
material  
suggest  
mere  
senate  
receive  
respectfully  
agreement  
unfortunate  
majority  
elaborate  
citizen  
necessary  
divide

**V**

principal  
testimony  
discussion  
arrangement  
reference  
evidence  
experience  
session  
secretary  
association  
career  
height

**W**

organization  
emergency  
appreciate  
sincerely  
athletic  
extreme  
practical  
proceed  
cordially  
character  
separate  
February

**X**

immediate  
convenient  
receipt  
preliminary  
disappoint  
especially  
annual  
committee

**Y**

decision  
principle

**Z**

judgment  
recommend  
allege

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- No. E 138. A Scale for Measuring the Quality of Handwriting of Adults. 11 pp. Report, 5 cts. Scale, 5 cts.
- No. E 139. A Measuring Scale for Ability in Spelling. 58 pp. Report, bound in cloth, 30 cts. Scale, 5 cts.
- Bulletin E. The Division of Education of the Russell Sage Foundation. 8 pp. No charge.

Note from the Internet Publisher: Donald L. Potter  
July 19, 2004

I am delighted to make this great work by Leonard P. Ayres available my web site, [donpotter.net](http://donpotter.net). Ayres was probably one of the greatest statisticians of his generation.

I especially would like to thank Geraldine Rodgers who provided me with an excellent photocopy of the book from which this scanned copy was made. It is to her credit that she saw the value of Ayres' Spelling Test for uncovering the superior reading and spelling ability of students of that era compared to present day students. Her seminal paper, TO URGE THE REPETITION OF THE AYRES' SPELLING TEST OF 1914-1915 TO CONFIRM THE EXISTENCE OF MASSIVE PRESENT-DAY DISABILITY AND TO ESTABLISH ITS CAUSE AND CURE (presented at *the National Institute of Education* (Federal Government) *Competitive Hearings on Proposed Research Projects* on June 22, 1983), is available on my web site. Ms. Rodgers informs me that her proposal received no notice from the government.

Also available on the [donpotter.net](http://donpotter.net) web site is a compilation of materials Ms. Rodgers prepared in 1984 as an introduction to a re-issue of Ayres' *Spelling Scale*. Most of the material was never used so I am making it available. Click on: [Historical Introduction to Leonard P. Ayres' A Measuring Scale for Ability in Spelling \(1915\)](#)