

1927

# A study of the vocabulary burden of three Junior high school mathematics texts

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BOSTON UNIVERSITY  
SCHOOL OF EDUCATION

Thesis

A Study of the Vocabulary Burden  
of Three Junior High School  
Mathematics Texts

Submitted by

Gertrude Cushing Yorke

(B.S. in Ed., B.U., 1924)

In partial fulfilment of requirements  
for the degree of Master of Education.

1927.

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Thesis Outline.

A Study of the Vocabulary Burden  
of Three Junior High School  
Mathematics Texts.

- I. Introduction - Page 3.
  1. Need for Investigation of Junior High School Mathematics texts - Page 3.
  2. Problem Stated - Page 3.
  3. Material Used - Page 4.
- II. Vocabulary Burden Study - Page 4.
  1. Method Used - Page 4.
    - (a) Vocabulary Range - Page 9.
    - (b) Zero-Value Words - Page 9.
    - (c) Weighted Median Index-Number - Page 9.
  2. Results - Page 35.
    - (a) Summary - Page 35.
    - (b) Graphs - Pages 35, 36, 37, 38.
  3. Conclusions - Page 39.
- III. Summary - Page 49.
- IV. Bibliography - Page 50.

Received of the Treasurer of the  
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for the purchase of books  
for the use of the  
schools of the district  
of Columbia  
for the year ending  
June 30, 1875  
this sum being  
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by the Board of  
Education  
on the 15th day of  
April, 1875



A STUDY OF THE VOCABULARY BURDEN  
OF THREE JUNIOR HIGH SCHOOL MATHEMATICS TEXTS.

- - - - -

I. Introduction.

(1) Need for Investigation.

Unquestionably "the teacher makes the school," but next in importance is the text book. It has been advocated from time to time that no texts be used in the schools, but experience has shown that such a method is too wasteful of energy and time, both for the pupil and the teacher. Since text books are a necessary part of classroom apparatus, they should be the best possible, and in accord with the best actual teaching - a real help to the pupils and teacher.

(2) Problem Stated.

It is generally conceded that the results of mathematics teaching in general, and Junior High School Mathematics teaching in particular, are not nearly up to the maximum of efficiency. Is much of the difficulty and inefficiency due to the text books used - granted the teaching is of the best type? This thesis is an attempt to study one phase of the question, as in any text book the Vocabulary Burden (difficulty of the words used) is of prime importance.



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## (3) Material Used.

The three Junior High School Mathematics texts studied are:

1. Drushel-Noonan-Withers -  
 "Arithmetical Essentials, Book Three" -  
 Lyons & Carnahan - New York - 1921 -  
 Seventh Year - Part I - Pp. 1-152.  
 Eighth Year - Part II - Pp. 153-296.
2. Hawkes-Luby-Touton -  
 "New First Course in Algebra" -  
 Ginn & Co., New York - 1925 -  
 Eighth Year - Pp. 1-214 (in some schools)  
 Ninth Year - Pp. 215-351 (in some schools)
3. Vosburgh-Gentleman-Hassler -  
 "Junior High School Mathematics -  
 Third Course - Revised Edition" -  
 Macmillan Co., New York - 1924 -  
 Ninth Year.

## II. Vocabulary Burden. (1)

## (1) Method Used.

The problem of determining the Vocabulary Burden of a given text necessarily first involves three questions of procedure -

1. How many words must any sampling include to give a reliable indication of the text's vocabulary?
2. How must these words be selected?

(1) See bibliography #3.



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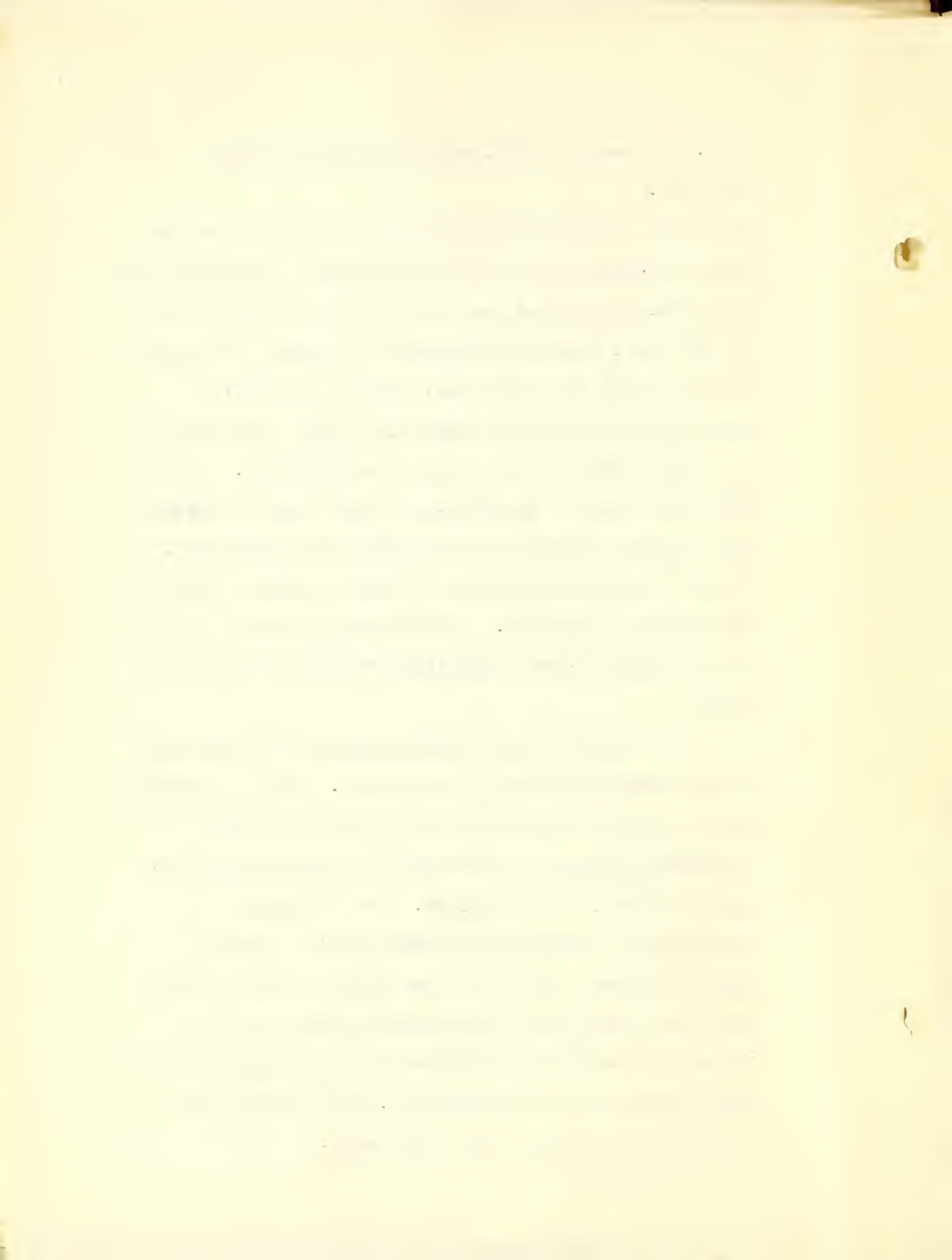
<http://archive.org/details/studyofvocabular00york>



1. How can the difficulty of these words be measured?

The answer to the first question depends, of course, on the degree of reliability required. A perfect but impracticable method would be to analyze every word in the text. Such a procedure is, however, unnecessarily minute and laborious, since a systematic sampling throughout the book will yield sufficient data upon which to base general conclusions. It has been found that a thousand-word unit gives a reasonably reliable indication regarding the vocabulary. If still greater accuracy is desired, several such units may be analyzed. The following Study is based on one thousand-word sampling from each of the three texts.

The answer to the second question is determined by the number of pages in each book. As the sampling must be evenly distributed throughout the text, a systematic number of words must be chosen from each page to make up the thousand. For instance, in "Arithmetical Essentials, Book Three" - Drushel-Hoonan-Withers - there are 296 pages, so four words were taken from every odd numbered page and three words from every even numbered page through page 270. Then from the last 26 pages (Pp. 271 through 296) two words were taken from every page.

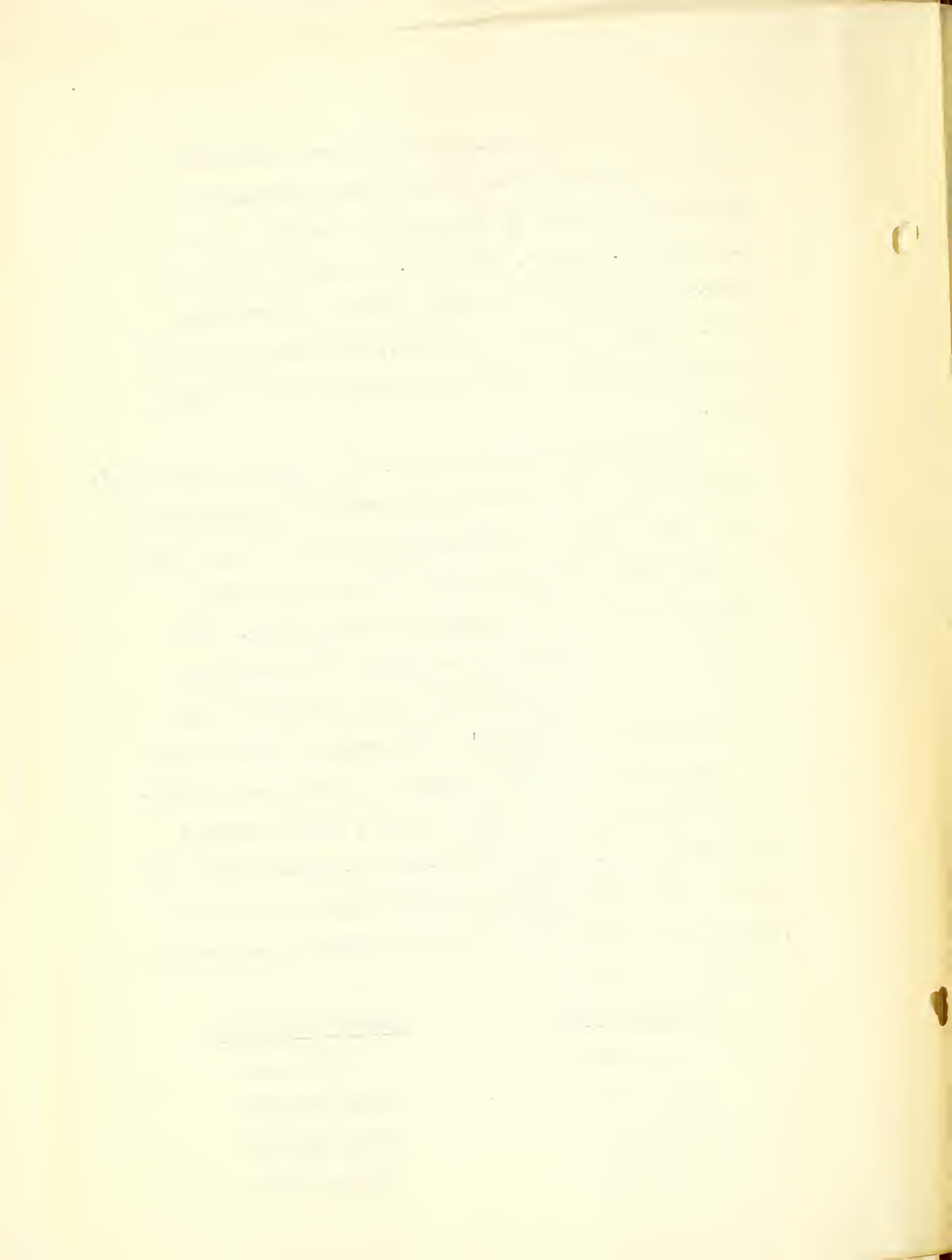


It was necessary sometimes to take more than the allotted number of words from a page, because the one preceding was made up entirely of numbers as, for example, Pp. 34, 37, 161, etc. In every instance, however, the effort was made to make the sampling fair. Also, as far as possible, the second line of the text was used, beginning usually with the first word.

The answer to question three is found in Thorndike's "Word Book". All the different words in the samplings were listed first in alphabetical order with the number of times each was used in the text and the index-number for each word, according to Thorndike. The interpretation of the index-numbers is as follows: "words having a credit-number (which measures range and frequency of the word's occurrence) of 49 or over are found in the 1st 1000 words in importance (including abbreviations and proper names); those having a credit-number of 29-48 are found in the 2nd 1000, and so on; while those having a credit-number of 8 lie between the 5545th and the 6047th word in importance, and so on. Thus -

<u>Credit-Number</u>		<u>Position of Word</u>
49 or over	-	1 to 1000
29 to 48	-	1001 to 2000
19 to 28	-	2001 to 3000
14 to 18	-	3001 to 4000





<u>Credit-Number</u>		<u>Position of Word</u>
10 to 13	-	4001 to 5144
9	-	5145 to 5544
8	-	5545 to 6047
7	-	6048 to 6618
6	-	6619 to 7262
5	-	7263 to 8145
4	-	8146 to 9190
3	-	9191 to 10000

In the case of the 5000 most important words, the credit-number is followed by a second number combined with a letter which indicates in which thousand and in which half thereof the word belongs. Thus, 2a means that the word is in the 1st half of the 2nd 1000, 3b means that the word is in the 2nd half of the 3rd 1000. Within the 1st 500 words there is a further distinction, - 1a1 meaning that the word is one of the 1st 100; 1a2 meaning that it is in the 2nd 100; 1a3, that it is in the 3rd 100; 1a4, that it is in the 4th 100; 1a5, that it is in the 5th 100.<sup>(1)</sup> Words which were not listed in the "word Book", and so are not among the 10000 most commonly used, are designated as zero-value words. Also in the Thorndike list "separate entries are not made of plurals in s; plurals where y is replaced by ies; adverbs formed by adding ly; comparatives and superlatives formed by adding er and est (including changes of y to ies and

(1) See bibliography #12.

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iest), or r and st; verb forms in s, d, ed (including changes of y to ies and ied) and ing; past participles formed by adding n, and adjectives formed by adding n to proper nouns. For example:

boys, girls, berries, are counted in with boy, girl, berry;

badly, sadly, are counted in with bad, sad;

longer, bravest, are counted in with long, brave;

plays, playing, played, are counted in with play;

thrown, outgrown, are counted in with throw, outgrow;

Austrian, Bavarian, are counted in with Austria, Bavaria." (1)

Some of the derivatives, which are "not to be known easily from knowledge of the primary word" (2) do appear separately in the Thorndike list, and so receive a special index-number. " Thus, likely would not be known from like; being and building should probably often be learned independently of be and build." (3)

Having collected and tabulated the necessary statistical data, the problem of the Vocabulary Burden of a text resolves itself into three questions -

1. How great is the range of the vocabulary - or how many different words are there in the thousand-word unit?
2. How many zero-value words are used?

(1), (2), (3) See bibliography #12

1870

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3. What is the weighted median index-number?

(a) Vocabulary Range.

To answer the first question the total number of different words per thousand was found by counting them from the statistics. The various derivations of a word were, of course, counted with the word as one. For instance, add and adding counted for one word; pay, paying, and pays counted for one word; etc. If, however, a separate index-number was given in Thorndike's list for derivatives - as for dividend, dividing, division, and divisor - such words were counted separately, and not as one word with divide.

(b) Zero-value Words.

The second question is answered by counting the number of different zero-value words in the index-number statistics. Thus, in "Arithmetical Essentials, Book Three" - Drushel-Noonan-Withers - there are 25 different words used, which do not appear at all in the Thorndike list of the most common 10000 words.

(c) Weighted Median Index-Number.

The answer to the third question is the middle index-number of the vocabulary range (or the total number of different words per thousand), counting the zero-value words twice to weight the median reasonably. To find the middle number the index-numbers were arranged in number order, beginning with 0, 3, 4, 5, etc., and also in letter order - as, for instance,





36-2a precedes 36-2b. As will be seen in the statistics following, the index-number is given at the left. To the right is given the number of different words used, and the words. The exponent after each indicates the number of repetitions, or how many times that word was used in the thousand-word sampling. Thus, in the Drushel unit there were 7 words with an index-number of 3, and accurate was used once. Then to the number of different words, or vocabulary range, was added again the number of zero-value words. Thus, in the above-mentioned text the total number of different words is 404. If 25, the number of zero-value words, is added, the total becomes 429, and the middle number is 215, which words have the index-number 50-1b. This, therefore, is the weighted median index-number. Of course, the higher the weighted median index-number is, the easier is the vocabulary, since it varies according to the number of times the words of low index-number are used.

The Vocabulary Burden statistics for the three texts studied will be found in the following pages. The "set-up" for getting these statistics from "Arithmetical Essentials, Book Three" - Drushel-Noonan-Withers - has already been given on Pp. 5-6.

The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that every entry should be supported by a valid receipt or invoice. This ensures transparency and allows for easy verification of the data.

In the second section, the author outlines the various methods used to collect and analyze the data. This includes both primary and secondary data collection techniques. The primary data was gathered through direct observation and interviews, while secondary data was obtained from existing reports and databases.

The third section details the statistical analysis performed on the collected data. It describes the use of descriptive statistics to summarize the data and inferential statistics to test hypotheses. The results of these analyses are presented in a clear and concise manner, highlighting the key findings of the study.

Finally, the document concludes with a summary of the findings and their implications. It discusses the limitations of the study and suggests areas for future research. The author expresses confidence in the reliability of the data and the validity of the conclusions drawn.

f

B

Table I - Showing for "Arithmetical Essentials, Book Three" -  
Drushel-Moonan-Withers, the analysis of 1000 random words.

Column 1 gives the index-number, Column 2 gives the number of words, and Column 3 gives the separate words with exponents, indicating the number of times the words occur in the 1000 list.

<u>Index Number</u>	<u>Number of Different Words</u>	<u>Words</u>
0	25	annum <sup>1</sup> , arc <sup>1</sup> , bisect <sup>2</sup> , Boyd <sup>1</sup> , Bros. <sup>1</sup> , Chapin <sup>1</sup> , convex <sup>1</sup> , diphtheria <sup>1</sup> , Feb. <sup>2</sup> , graph <sup>2</sup> , Grimes <sup>1</sup> , inventory <sup>1</sup> , isosceles <sup>1</sup> , Lake Superior <sup>1</sup> , Minneapolis <sup>1</sup> , oblong <sup>1</sup> , Ogden <sup>1</sup> , parentheses <sup>1</sup> , perimeter <sup>1</sup> , polygon <sup>1</sup> , Spalding <sup>1</sup> , Stanford <sup>1</sup> , St. Mary's River <sup>1</sup> , trapezoid <sup>2</sup> , vertex <sup>1</sup> .
3	7	accurate <sup>1</sup> , broker <sup>1</sup> , decimal <sup>2</sup> , diagonal <sup>1</sup> , reservoir <sup>1</sup> , specify <sup>1</sup> , subtraction <sup>1</sup> .
4	5	assess <sup>1</sup> , bbl. <sup>1</sup> , compensation <sup>1</sup> , discount <sup>2</sup> , Stewart <sup>1</sup> .
5	4	divisor <sup>1</sup> , duplicate <sup>1</sup> , investment <sup>1</sup> , tumbler <sup>1</sup> .
6	7	arithmetic <sup>1</sup> , Cincinnati <sup>1</sup> , economical <sup>1</sup> , factor <sup>1</sup> , fitness <sup>1</sup> , inspection <sup>1</sup> , verify <sup>1</sup> .
7	5	achievement <sup>1</sup> , doz. <sup>1</sup> , effective <sup>1</sup> , Oct. <sup>1</sup> , subscription <sup>1</sup> .
8	3	altitude <sup>3</sup> , buyer <sup>1</sup> , teller <sup>1</sup> .
9	3	¢ <sup>2</sup> , levy <sup>1</sup> , triangle <sup>1</sup> .
10-5b	8	announce <sup>1</sup> , banker <sup>1</sup> , gravel <sup>1</sup> , in. <sup>2</sup> , Jan. <sup>1</sup> , legal <sup>1</sup> , physical <sup>1</sup> , proposition <sup>1</sup> .

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Table I - continued.

<u>Index Number</u>	<u>Number of Different words</u>	<u>Words</u>
11-5b	2	corporation <sup>1</sup> , rectangle <sup>1</sup> .
12-5a	1	quote <sup>1</sup> .
13-5a	8	Adam <sup>1</sup> , distribute <sup>1</sup> , fraction <sup>1</sup> , income <sup>1</sup> , invest <sup>1</sup> , project <sup>1</sup> , Samuel <sup>1</sup> , shrink <sup>1</sup> .
14-4b	4	lb. <sup>3</sup> , postage <sup>1</sup> , thickness <sup>1</sup> , transportation <sup>1</sup> .
15-4b	7	angle <sup>4</sup> , community <sup>1</sup> , convert <sup>1</sup> , enable <sup>1</sup> , irregular <sup>1</sup> , magazine <sup>1</sup> , umbrella <sup>1</sup> .
16-4a	3	fee <sup>1</sup> , previous <sup>1</sup> , statement <sup>1</sup> .
17-4a	1	ft. <sup>4</sup>
18-4a	1	circular <sup>1</sup> .
19-3b	2	breadth <sup>1</sup> , quart <sup>1</sup> .
20-3b	3	attach <sup>2</sup> , receipt <sup>1</sup> , remainder <sup>1</sup> .
21-3b	3	cash <sup>2</sup> , Chicago <sup>2</sup> , hog <sup>1</sup> .
22-3b	1	curve <sup>1</sup> .
23-3a	3	ounce <sup>1</sup> , problem <sup>2</sup> , relative <sup>1</sup> .
24-3a	4	average <sup>1</sup> , method <sup>2</sup> , multiply <sup>2</sup> , original <sup>1</sup> .
25-3a	6	area <sup>1</sup> , bond <sup>1</sup> , population <sup>1</sup> , register <sup>1</sup> , ton <sup>2</sup> , uniform <sup>1</sup> .
26-3a	4	bushel <sup>1</sup> , department <sup>1</sup> , raw <sup>1</sup> , recent <sup>1</sup> .
26-4a	1	accident <sup>1</sup> .
27-3a	1	width <sup>1</sup> .
28-3a	4	lend <sup>1</sup> , package <sup>1</sup> , slide <sup>1</sup> , Smith <sup>1</sup> .
29-2b	2	alike <sup>1</sup> , assist <sup>1</sup> .
30-2b	1	Indicate <sup>1</sup> .

The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that every entry should be supported by a valid receipt or invoice. This ensures transparency and allows for easy verification of the data.

In the second section, the author outlines the various methods used to collect and analyze the data. This includes both primary and secondary sources, as well as the specific techniques employed for data processing and statistical analysis.

The third section provides a detailed overview of the results obtained from the study. It highlights the key findings and discusses their implications for the field. The author also addresses any limitations of the study and suggests areas for future research.

Finally, the document concludes with a summary of the main points and a final statement on the significance of the work. The author expresses their gratitude to the funding agencies and the participants who made the study possible.

Table I - continued.

<u>Index Number</u>	<u>Number of Different Words</u>	<u>Words</u>
31-2b	5	balance <sup>2</sup> , collect <sup>1</sup> , grade <sup>2</sup> , lawn <sup>1</sup> , per <sup>3</sup> .
33-2b	3	expense <sup>1</sup> , group <sup>1</sup> , product <sup>2</sup> .
34-2b	5	acre <sup>2</sup> , dine <sup>1</sup> , period <sup>1</sup> , profit <sup>1</sup> , test <sup>1</sup> .
35-2b	2	depend <sup>1</sup> , glove <sup>1</sup> .
36-2a	2	January <sup>1</sup> , net <sup>2</sup> .
36-2b	1	surface <sup>1</sup> .
37-2a	2	paid <sup>1</sup> , total <sup>3</sup> .
38-2a	1	potato <sup>1</sup> .
39-2a	4	correct <sup>2</sup> , merchant <sup>1</sup> , pupil <sup>2</sup> , term <sup>2</sup> .
40-2a	3	brick <sup>1</sup> , describe <sup>1</sup> , represent <sup>1</sup> .
41-2a	3	due <sup>4</sup> , example <sup>1</sup> , upper <sup>1</sup> .
42-2a	2	James <sup>1</sup> , prevent <sup>1</sup> .
43-2a	5	degree <sup>1</sup> , furnish <sup>1</sup> , hen <sup>1</sup> , produce <sup>1</sup> , weigh <sup>1</sup> .
44-2a	1	record <sup>1</sup> .
45-2a	3	bush <sup>1</sup> , knowledge <sup>1</sup> , sum <sup>2</sup> .
46-2a	6	below <sup>1</sup> , bought <sup>1</sup> , bounded <sup>1</sup> , rate <sup>2</sup> , root <sup>1</sup> , slip <sup>1</sup> .
47-2a	4	agree <sup>1</sup> , block <sup>1</sup> , check <sup>4</sup> , map <sup>1</sup> .
48-2a	4	card <sup>1</sup> , inside <sup>1</sup> , July <sup>1</sup> , result <sup>4</sup> .
49-1b	1	date <sup>2</sup> .
50-1b	3	difference <sup>1</sup> , load <sup>1</sup> , object <sup>1</sup> .
51-1b	6	amount <sup>4</sup> , exercise <sup>1</sup> , inch <sup>2</sup> , loss <sup>1</sup> , proper <sup>1</sup> , stock <sup>1</sup> .
52-1b	1	New York <sup>1</sup> .
53-1b	3	firm <sup>1</sup> , require <sup>1</sup> , sand <sup>1</sup> .

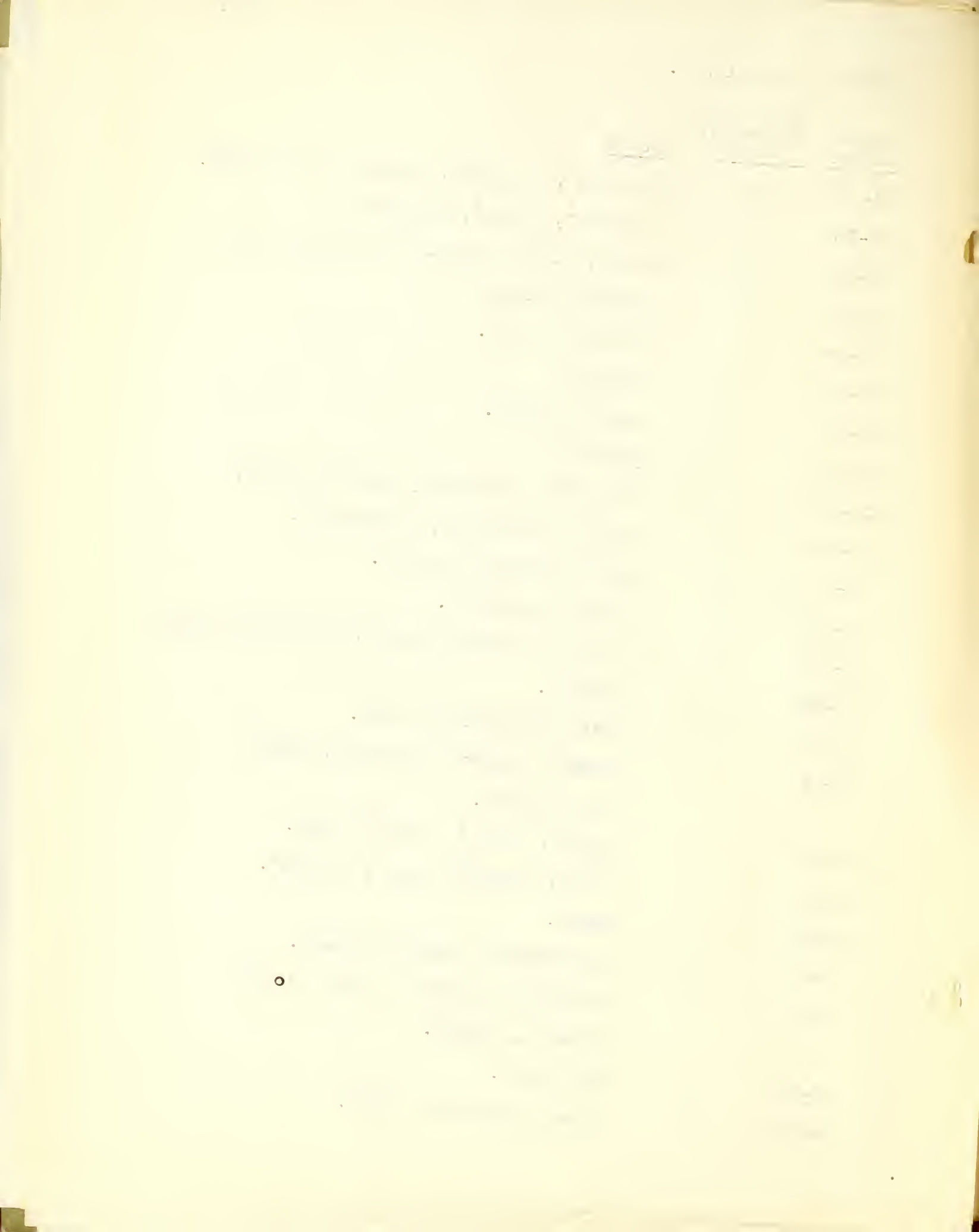


Table I - continued.

<u>Index Number</u>	<u>Number of Different Words</u>	<u>Words</u>
54-lb	1	following <sup>4</sup> .
55-lb	1	Golden <sup>1</sup> .
56-lb	2	American <sup>1</sup> , single <sup>1</sup> .
57-lb	5	duty <sup>1</sup> , neither <sup>1</sup> , sold <sup>2</sup> , therefore <sup>1</sup> , value <sup>4</sup> .
58-lb	3	grain <sup>1</sup> , manner <sup>1</sup> , pull <sup>1</sup> .
59-lb	2	farmer <sup>1</sup> , price <sup>1</sup> .
60-lb	1	class <sup>1</sup> .
61-lb	1	nature <sup>1</sup> .
62-lb	2	common <sup>2</sup> , direct <sup>1</sup> .
63-lb	3	account <sup>2</sup> , deal <sup>1</sup> , Mr. <sup>4</sup> .
64-lb	1	square <sup>2</sup> .
65-lb	2	page <sup>2</sup> , party <sup>1</sup> .
67-lb	2	bill <sup>2</sup> , within <sup>1</sup> .
68-lb	6	figure <sup>3</sup> , interest <sup>3</sup> , offer <sup>1</sup> , sell <sup>2</sup> , straight <sup>1</sup> , study <sup>1</sup> .
70-lb	3	cost <sup>2</sup> , either <sup>2</sup> , worth <sup>1</sup> .
71-lb	3	age <sup>3</sup> , board <sup>1</sup> , store <sup>1</sup> .
72-lb	1	whose <sup>4</sup> .
73-lb	1	business <sup>1</sup> .
75-la	1	add <sup>2</sup> .
75-la5	1	east <sup>1</sup> .
75-lb	1	rule <sup>2</sup> .
77-la5	3	certain <sup>1</sup> , John <sup>1</sup> , Soldier <sup>1</sup> .
78-la5	3	apple <sup>1</sup> , corn <sup>1</sup> , length <sup>1</sup> .
79-la5	1	measure <sup>1</sup> .



Page	Page	Page
1	2	3
4	5	6
7	8	9
10	11	12
13	14	15
16	17	18
19	20	21
22	23	24
25	26	27
28	29	30
31	32	33
34	35	36
37	38	39
40	41	42
43	44	45
46	47	48
49	50	51
52	53	54
55	56	57
58	59	60
61	62	63
64	65	66
67	68	69
70	71	72
73	74	75
76	77	78
79	80	81
82	83	84
85	86	87
88	89	90
91	92	93
94	95	96
97	98	99
100	101	102

Table I - continued.

<u>Index Number</u>	<u>Number of Different Words</u>	<u>Words</u>
80-1a5	1	buy <sup>1</sup> .
81-1a5	1	general <sup>1</sup> .
82-1a5	3	death <sup>1</sup> , feet <sup>2</sup> , month <sup>3</sup> .
83-1a5	<b>3</b>	across <sup>1</sup> , bank <sup>3</sup> , <i>remember<sup>1</sup></i> .
84-1a5	<b>2</b>	less <sup>1</sup> , week <sup>1</sup> .
86-1a4	1	free <sup>1</sup> .
88-1a4	3	children <sup>2</sup> , north <sup>1</sup> , receive <sup>3</sup> ,
89-1a4	1	draw <sup>2</sup> .
90-1a4	1	table <sup>2</sup> .
91-1a4	2	answer <sup>4</sup> , piece <sup>1</sup> .
92-1a4	1	paper <sup>1</sup> .
93-1a4	2	pay <sup>4</sup> , write <sup>3</sup> .
94-1a4	3	ask <sup>1</sup> , fill <sup>1</sup> , short <sup>1</sup> .
96-1a3	1	given <sup>1</sup> .
97-1a3	3	begin <sup>1</sup> , next <sup>1</sup> , whole <sup>1</sup> .
99-1a3	1	foot <sup>1</sup> .
100-1a3	2	mean <sup>1</sup> , order <sup>1</sup> .
101-1a3	3	above <sup>1</sup> , change <sup>2</sup> , does <sup>1</sup> .
104-1a3	2	number <sup>6</sup> , wish <sup>2</sup> .
105-1a1	1	point <sup>1</sup> .
107-1a3	2	state <sup>2</sup> , without <sup>1</sup> .
109-1a3	3	help <sup>1</sup> , money <sup>3</sup> , read <sup>1</sup> .
110-1a3	2	country <sup>1</sup> , want <sup>1</sup> .
112-1a2	1	pass <sup>1</sup> .
113-1a2	1	cut <sup>2</sup> .

Revenue

3

6

Table I - continued.

<u>Index Number</u>	<u>Number of Different Words</u>	<u>Words</u>
114-1a2	4	book <sup>1</sup> , city <sup>1</sup> , found <sup>2</sup> , its <sup>1</sup> .
115-1a2	4	far <sup>1</sup> , must <sup>3</sup> , said <sup>1</sup> , tree <sup>1</sup> .
116-1a2	1	another <sup>1</sup> .
117-1a2	1	leave <sup>1</sup> .
118-1a2	1	small <sup>1</sup> .
119-1a2	3	also <sup>2</sup> , between <sup>1</sup> , left <sup>1</sup> .
120-1a2	1	right <sup>4</sup> .
121-1a2	1	tell <sup>1</sup> .
122-1a2	2	boy <sup>1</sup> , land <sup>1</sup> .
123-1a2	3	could <sup>1</sup> , large <sup>3</sup> , show <sup>5</sup> .
124-1a2	1	think <sup>1</sup> .
125-1a2	1	most <sup>2</sup> .
126-1a2	2	open <sup>1</sup> , people <sup>2</sup> .
128-1a2	1	home <sup>1</sup> .
129-1a2	1	same <sup>1</sup> .
130-1a2	1	should <sup>2</sup> .
131-1a2	2	find <sup>11</sup> , side <sup>2</sup> .
132-1a2	2	head <sup>1</sup> , upon <sup>1</sup> .
133-1a2	1	back <sup>1</sup> .
136-1a2	1	three <sup>1</sup> .
137-1a2	1	use <sup>5</sup> .
140-1a2	1	just <sup>1</sup> .
141-1a2	2	did <sup>1</sup> , high <sup>3</sup> .
142 -1a2	1	each <sup>6</sup> .
145-1a2	1	part <sup>3</sup> .

Date	Description	Debit	Credit
Jan 1	Balance		100.00
Jan 5	Wages	20.00	
Jan 10	Expenses	15.00	
Jan 15	Income		30.00
Jan 20	Wages	25.00	
Jan 25	Expenses	10.00	
Jan 30	Income		20.00
Feb 1	Balance		110.00
Feb 5	Wages	30.00	
Feb 10	Expenses	20.00	
Feb 15	Income		40.00
Feb 20	Wages	35.00	
Feb 25	Expenses	15.00	
Feb 30	Income		30.00
Mar 1	Balance		120.00
Mar 5	Wages	40.00	
Mar 10	Expenses	25.00	
Mar 15	Income		50.00
Mar 20	Wages	45.00	
Mar 25	Expenses	20.00	
Mar 30	Income		40.00
Apr 1	Balance		130.00
Apr 5	Wages	50.00	
Apr 10	Expenses	30.00	
Apr 15	Income		60.00
Apr 20	Wages	55.00	
Apr 25	Expenses	25.00	
Apr 30	Income		50.00
May 1	Balance		140.00
May 5	Wages	60.00	
May 10	Expenses	35.00	
May 15	Income		70.00
May 20	Wages	65.00	
May 25	Expenses	30.00	
May 30	Income		60.00
Jun 1	Balance		150.00
Jun 5	Wages	70.00	
Jun 10	Expenses	40.00	
Jun 15	Income		80.00
Jun 20	Wages	75.00	
Jun 25	Expenses	35.00	
Jun 30	Income		70.00
Jul 1	Balance		160.00
Jul 5	Wages	80.00	
Jul 10	Expenses	45.00	
Jul 15	Income		90.00
Jul 20	Wages	85.00	
Jul 25	Expenses	40.00	
Jul 30	Income		80.00
Aug 1	Balance		170.00
Aug 5	Wages	90.00	
Aug 10	Expenses	50.00	
Aug 15	Income		100.00
Aug 20	Wages	95.00	
Aug 25	Expenses	45.00	
Aug 30	Income		90.00
Sep 1	Balance		180.00
Sep 5	Wages	100.00	
Sep 10	Expenses	55.00	
Sep 15	Income		110.00
Sep 20	Wages	105.00	
Sep 25	Expenses	50.00	
Sep 30	Income		100.00
Oct 1	Balance		190.00
Oct 5	Wages	110.00	
Oct 10	Expenses	60.00	
Oct 15	Income		120.00
Oct 20	Wages	115.00	
Oct 25	Expenses	55.00	
Oct 30	Income		110.00
Nov 1	Balance		200.00
Nov 5	Wages	120.00	
Nov 10	Expenses	65.00	
Nov 15	Income		130.00
Nov 20	Wages	125.00	
Nov 25	Expenses	60.00	
Nov 30	Income		120.00
Dec 1	Balance		210.00
Dec 5	Wages	130.00	
Dec 10	Expenses	70.00	
Dec 15	Income		140.00
Dec 20	Wages	135.00	
Dec 25	Expenses	65.00	
Dec 30	Income		130.00

1

2



Table I - continued.

<u>Index Number</u>	<u>Number of Different words</u>	<u>Words</u>
146-1a2	2	call <sup>2</sup> , has <sup>3</sup> .
149-1a2	1	may <sup>6</sup> .
151-1a1	3	two <sup>2</sup> , work <sup>2</sup> , year <sup>3</sup> .
153-1a1	1	many <sup>3</sup> .
156-1a1	2	only <sup>2</sup> , place <sup>3</sup> .
157-1a1	3	much <sup>3</sup> , such <sup>1</sup> , than <sup>2</sup> .
158-1a1	2	after <sup>4</sup> , any <sup>2</sup> .
159-1a1	1	your <sup>4</sup> .
163-1a1	1	can <sup>6</sup> .
167-1a1	1	way <sup>1</sup> .
168-1a1	3	good <sup>1</sup> , other <sup>5</sup> , over. <sup>1</sup>
170-1a1	1	we <sup>2</sup> .
171-1a1	1	how <sup>11</sup> .
172-1a1	2	had <sup>1</sup> , see <sup>1</sup> .
173-1a1	1	then <sup>5</sup> .
175-1a1	1	man <sup>2</sup> .
176-1a1	2	day <sup>4</sup> , make <sup>1</sup> .
178-1a1	1	if <sup>2</sup> .
180-1a1	1	were <sup>2</sup> .
181-1a1	5	an <sup>8</sup> , or <sup>6</sup> , some <sup>4</sup> , them <sup>1</sup> , which <sup>8</sup> .
183-1a1	2	are <sup>8</sup> , time <sup>5</sup> .
184-1a1	1	who <sup>5</sup> .
187-1a1	1	is <sup>15</sup> .
188-1a1	4	so <sup>1</sup> , was <sup>7</sup> , what <sup>8</sup> , you <sup>2</sup> .
191-1a1	2	by <sup>8</sup> , this <sup>3</sup> .

Year	Month	Day	Event
1861	Jan	1	...
1861	Jan	2	...
1861	Jan	3	...
1861	Jan	4	...
1861	Jan	5	...
1861	Jan	6	...
1861	Jan	7	...
1861	Jan	8	...
1861	Jan	9	...
1861	Jan	10	...
1861	Jan	11	...
1861	Jan	12	...
1861	Jan	13	...
1861	Jan	14	...
1861	Jan	15	...
1861	Jan	16	...
1861	Jan	17	...
1861	Jan	18	...
1861	Jan	19	...
1861	Jan	20	...
1861	Jan	21	...
1861	Jan	22	...
1861	Jan	23	...
1861	Jan	24	...
1861	Jan	25	...
1861	Jan	26	...
1861	Jan	27	...
1861	Jan	28	...
1861	Jan	29	...
1861	Jan	30	...
1861	Jan	31	...

1

Table I - continued.

<u>Index Number</u>	<u>Number of Different Words</u>	<u>Words</u>
193-1a1	2	out <sup>2</sup> , when <sup>2</sup> .
194-1a1	5	have <sup>3</sup> , he <sup>4</sup> , his <sup>4</sup> , there <sup>4</sup> , they <sup>3</sup> .
195-1a1	1	from <sup>5</sup> .
199-1a1	2	it <sup>6</sup> , one <sup>2</sup> .
200-1a1	1	on <sup>8</sup> .
201-1a1	1	for <sup>10</sup> .
203-1a1	2	all <sup>4</sup> , at <sup>7</sup> .
204-1a1	1	as <sup>5</sup> .
205-1a1	1	of <sup>47</sup> .
206-1a1	1	be <sup>3</sup> .
208-1a1	4	a <sup>34</sup> , the <sup>96</sup> , to <sup>27</sup> , with <sup>9</sup> .
209-1a1	1	that <sup>3</sup> .
210-1a1	1	and <sup>26</sup> .
211-1a1	1	in <sup>24</sup> .

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404

Note - The total of the exponents is 1000.

Vocabulary Range - 404 words.

Zero-Value Words - 25 words.

Weighted Median Index-Number - 50-lb.

Year	Month	Day	Event
1900	Jan	1	...
1900	Jan	2	...
1900	Jan	3	...
1900	Jan	4	...
1900	Jan	5	...
1900	Jan	6	...
1900	Jan	7	...
1900	Jan	8	...
1900	Jan	9	...
1900	Jan	10	...
1900	Jan	11	...
1900	Jan	12	...
1900	Jan	13	...
1900	Jan	14	...
1900	Jan	15	...
1900	Jan	16	...
1900	Jan	17	...
1900	Jan	18	...
1900	Jan	19	...
1900	Jan	20	...
1900	Jan	21	...
1900	Jan	22	...
1900	Jan	23	...
1900	Jan	24	...
1900	Jan	25	...
1900	Jan	26	...
1900	Jan	27	...
1900	Jan	28	...
1900	Jan	29	...
1900	Jan	30	...
1900	Jan	31	...

...

...

...

The "set-up" for getting the following statistics from "New First Course in Algebra" - Hawkes-Luby-Touton - was three words taken from every page through Page 300. Then from the last fifty pages two words were taken from each page. Since there were 357 pages in the text, the thousand-word sampling was thus obtained. As was before stated, it was necessary sometimes to take more than the allotted number of words from a page, because the one preceding was made up entirely of numbers, as, for example, Pp. 212, 218, 262, etc., in which case six words, instead of three, were taken from Pp. 213, 219, 263, etc. Usually the second line of the text was used, beginning with the first words; if, however, the first line were a heading, then the third line was used.

Table 2 - Showing for "New First Course in Algebra" - Hawkes-Luby-Touton, the analysis of 1000 random words.

Column 1 gives the index-number, Column 2 gives the number of words, and Column 3 gives the separate words with exponents, indicating the number of times the words occur in the 1000 list.

<u>Index Number</u>	<u>Number of Different Words</u>	<u>Words</u>
0	23	axion <sup>1</sup> , binomial <sup>1</sup> , coefficient <sup>3</sup> , denominator <sup>4</sup> , digits <sup>1</sup> , equation <sup>9</sup> , exponents <sup>1</sup> , graphically <sup>2</sup> , half-dollars <sup>1</sup> , half-fare <sup>1</sup> , integer <sup>1</sup> , literal <sup>1</sup> , numerator <sup>5</sup> , one-digit <sup>1</sup> , polynomial <sup>1</sup> , quadratic <sup>1</sup> , ratio <sup>1</sup> , sheet-metal <sup>1</sup> , simplify <sup>3</sup> , tangent <sup>1</sup> , transposing <sup>1</sup> , transposition <sup>1</sup> , two-digit <sup>1</sup> .



*[The text on this page is extremely faint and illegible. It appears to be a multi-paragraph document, possibly a letter or a report, with some lines of text visible but not readable.]*

61

62

Table 2 - continued.

<u>Index Number</u>	<u>Number of Different Words</u>	<u>Words</u>
3	6	census <sup>1</sup> , classify <sup>1</sup> , diagonal <sup>1</sup> , dividing <sup>3</sup> , percentage <sup>1</sup> , shortage <sup>1</sup> .
4	3	bracket <sup>1</sup> , cancel <sup>1</sup> , query <sup>1</sup> .
5	3	acute <sup>1</sup> , divisor <sup>1</sup> , Rhode Island <sup>1</sup> .
6	8	algebra <sup>2</sup> , arithmetic <sup>2</sup> , chauffeur <sup>1</sup> , equivalent <sup>1</sup> , factor <sup>4</sup> , quotient <sup>1</sup> , verify <sup>2</sup> , warehouse <sup>1</sup> .
7	1	dividend <sup>1</sup> .
8	7	altitude <sup>1</sup> , axis <sup>1</sup> , expand <sup>1</sup> , illustration <sup>1</sup> , kerosene <sup>1</sup> , mathematics <sup>1</sup> , subtract <sup>2</sup> .
9	5	∅ <sup>1</sup> , invert <sup>1</sup> , negative <sup>2</sup> , triangle <sup>1</sup> , unit <sup>1</sup> .
10-5b	4	explanation <sup>1</sup> , solution <sup>2</sup> , successive <sup>1</sup> , thermometer <sup>1</sup> .
11-5b	1	extract <sup>1</sup> .
12-5a	1	respective <sup>1</sup> .
13-5a	5	chalk <sup>1</sup> , expression <sup>7</sup> , fraction <sup>5</sup> , illustrate <sup>2</sup> , zero <sup>1</sup> .
14-4b	3	involve <sup>1</sup> , symbol <sup>2</sup> , unlike <sup>1</sup> .
15-4b	4	angle <sup>2</sup> , hint <sup>3</sup> , Massachusetts <sup>1</sup> , tank <sup>1</sup> .
16-4a	2	prime <sup>1</sup> , substitute <sup>1</sup> .
19-3b	1	retain <sup>1</sup> .
20-3b	3	basin <sup>1</sup> , remainder <sup>1</sup> , solve <sup>5</sup> .
21-3b	2	application <sup>1</sup> , connection <sup>1</sup> .
23-3a	3	difficulty <sup>1</sup> , problem <sup>1</sup> , process <sup>4</sup> .
24-3a	4	arise <sup>1</sup> , combine <sup>1</sup> , method <sup>3</sup> , multiply <sup>1</sup> .

1. The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that every entry should be supported by a valid receipt or invoice. This ensures transparency and allows for easy verification of the data.

2. The second part of the document outlines the procedures for handling discrepancies. It states that any differences between the recorded amounts and the actual amounts should be investigated immediately. The responsible parties should be identified, and the reasons for the discrepancy should be documented.

3. The third part of the document describes the process of reconciling accounts. It requires that all accounts be reconciled at the end of each month. This involves comparing the internal records with the bank statements and identifying any variances. Once reconciled, the accounts should be signed off by the responsible officer.

4. The fourth part of the document discusses the importance of regular audits. It states that audits should be conducted at least once a year to ensure that all records are accurate and that the procedures are being followed correctly. The results of the audits should be reported to the management and used to improve the system.

5. The fifth part of the document describes the process of archiving records. It requires that all records be stored in a secure and accessible location. The records should be organized in a way that makes it easy to find them when needed. The retention period for the records should be clearly defined and followed.

6. The sixth part of the document discusses the importance of training. It states that all staff members who are involved in the financial process should receive regular training. This ensures that they are up-to-date on the latest procedures and best practices. Training should be provided in a way that is easy to understand and practical.

7. The seventh part of the document describes the process of reviewing the system. It requires that the system be reviewed at least once a year to ensure that it is still relevant and effective. The review should consider changes in the business environment and the needs of the organization. The results of the review should be used to make improvements to the system.

8. The eighth part of the document discusses the importance of communication. It states that all staff members should be kept informed of any changes to the system. This ensures that they are aware of their responsibilities and can perform their duties effectively. Communication should be done in a clear and concise manner.

9. The ninth part of the document describes the process of implementing the system. It requires that the system be implemented in a phased manner. This allows for testing and refinement of the system before it is fully implemented. The implementation should be supported by training and communication.

10. The tenth part of the document discusses the importance of monitoring the system. It states that the system should be monitored regularly to ensure that it is working as intended. Any issues should be identified and resolved as quickly as possible. Monitoring should be done in a way that does not disrupt the normal operations of the organization.

Date	Description	Amount	Balance
2023-01-01	Opening Balance	1000.00	1000.00
2023-01-05	Payment received from Client A	250.00	1250.00
2023-01-10	Payment received from Client B	150.00	1400.00
2023-01-15	Payment received from Client C	100.00	1500.00
2023-01-20	Payment received from Client D	100.00	1600.00
2023-01-25	Payment received from Client E	100.00	1700.00
2023-01-30	Payment received from Client F	100.00	1800.00
2023-02-05	Payment received from Client G	100.00	1900.00
2023-02-10	Payment received from Client H	100.00	2000.00
2023-02-15	Payment received from Client I	100.00	2100.00
2023-02-20	Payment received from Client J	100.00	2200.00
2023-02-25	Payment received from Client K	100.00	2300.00
2023-03-01	Payment received from Client L	100.00	2400.00
2023-03-05	Payment received from Client M	100.00	2500.00
2023-03-10	Payment received from Client N	100.00	2600.00
2023-03-15	Payment received from Client O	100.00	2700.00
2023-03-20	Payment received from Client P	100.00	2800.00
2023-03-25	Payment received from Client Q	100.00	2900.00
2023-03-30	Payment received from Client R	100.00	3000.00
2023-04-01	Payment received from Client S	100.00	3100.00
2023-04-05	Payment received from Client T	100.00	3200.00
2023-04-10	Payment received from Client U	100.00	3300.00
2023-04-15	Payment received from Client V	100.00	3400.00
2023-04-20	Payment received from Client W	100.00	3500.00
2023-04-25	Payment received from Client X	100.00	3600.00
2023-04-30	Payment received from Client Y	100.00	3700.00
2023-05-01	Payment received from Client Z	100.00	3800.00
2023-05-05	Payment received from Client AA	100.00	3900.00
2023-05-10	Payment received from Client AB	100.00	4000.00
2023-05-15	Payment received from Client AC	100.00	4100.00
2023-05-20	Payment received from Client AD	100.00	4200.00
2023-05-25	Payment received from Client AE	100.00	4300.00
2023-05-30	Payment received from Client AF	100.00	4400.00
2023-06-01	Payment received from Client AG	100.00	4500.00
2023-06-05	Payment received from Client AH	100.00	4600.00
2023-06-10	Payment received from Client AI	100.00	4700.00
2023-06-15	Payment received from Client AJ	100.00	4800.00
2023-06-20	Payment received from Client AK	100.00	4900.00
2023-06-25	Payment received from Client AL	100.00	5000.00
2023-06-30	Payment received from Client AM	100.00	5100.00
2023-07-01	Payment received from Client AN	100.00	5200.00
2023-07-05	Payment received from Client AO	100.00	5300.00
2023-07-10	Payment received from Client AP	100.00	5400.00
2023-07-15	Payment received from Client AQ	100.00	5500.00
2023-07-20	Payment received from Client AR	100.00	5600.00
2023-07-25	Payment received from Client AS	100.00	5700.00
2023-07-30	Payment received from Client AT	100.00	5800.00
2023-08-01	Payment received from Client AU	100.00	5900.00
2023-08-05	Payment received from Client AV	100.00	6000.00
2023-08-10	Payment received from Client AW	100.00	6100.00
2023-08-15	Payment received from Client AX	100.00	6200.00
2023-08-20	Payment received from Client AY	100.00	6300.00
2023-08-25	Payment received from Client AZ	100.00	6400.00
2023-08-30	Payment received from Client BA	100.00	6500.00
2023-09-01	Payment received from Client BB	100.00	6600.00
2023-09-05	Payment received from Client BC	100.00	6700.00
2023-09-10	Payment received from Client BD	100.00	6800.00
2023-09-15	Payment received from Client BE	100.00	6900.00
2023-09-20	Payment received from Client BF	100.00	7000.00
2023-09-25	Payment received from Client BG	100.00	7100.00
2023-09-30	Payment received from Client BH	100.00	7200.00
2023-10-01	Payment received from Client BI	100.00	7300.00
2023-10-05	Payment received from Client BJ	100.00	7400.00
2023-10-10	Payment received from Client BK	100.00	7500.00
2023-10-15	Payment received from Client BL	100.00	7600.00
2023-10-20	Payment received from Client BM	100.00	7700.00
2023-10-25	Payment received from Client BN	100.00	7800.00
2023-10-30	Payment received from Client BO	100.00	7900.00
2023-11-01	Payment received from Client BP	100.00	8000.00
2023-11-05	Payment received from Client BQ	100.00	8100.00
2023-11-10	Payment received from Client BR	100.00	8200.00
2023-11-15	Payment received from Client BS	100.00	8300.00
2023-11-20	Payment received from Client BT	100.00	8400.00
2023-11-25	Payment received from Client BU	100.00	8500.00
2023-11-30	Payment received from Client BV	100.00	8600.00
2023-12-01	Payment received from Client BV	100.00	8700.00
2023-12-05	Payment received from Client BV	100.00	8800.00
2023-12-10	Payment received from Client BV	100.00	8900.00
2023-12-15	Payment received from Client BV	100.00	9000.00
2023-12-20	Payment received from Client BV	100.00	9100.00
2023-12-25	Payment received from Client BV	100.00	9200.00
2023-12-30	Payment received from Client BV	100.00	9300.00
2024-01-01	Payment received from Client BV	100.00	9400.00
2024-01-05	Payment received from Client BV	100.00	9500.00
2024-01-10	Payment received from Client BV	100.00	9600.00
2024-01-15	Payment received from Client BV	100.00	9700.00
2024-01-20	Payment received from Client BV	100.00	9800.00
2024-01-25	Payment received from Client BV	100.00	9900.00
2024-01-30	Payment received from Client BV	100.00	10000.00

Table 2 - continued.

<u>Index Number</u>	<u>Number of Different words</u>	<u>words</u>
25-3a	4	area <sup>4</sup> , barrel <sup>1</sup> , exceed <sup>1</sup> , likely <sup>1</sup> .
26-3a	4	division <sup>1</sup> , eighth <sup>1</sup> , relation <sup>1</sup> , type <sup>2</sup> .
28-3a	1	passenger <sup>1</sup> .
29-2b	2	operation <sup>5</sup> , unknown <sup>2</sup> .
30-2b	4	error <sup>1</sup> , indicate <sup>5</sup> , odd <sup>1</sup> , student <sup>1</sup> .
31-2b	2	collect <sup>1</sup> , per <sup>5</sup> .
32-2b	1	throughout <sup>1</sup> .
33-2b	2	consist <sup>1</sup> , product <sup>3</sup> .
34-2b	3	perform <sup>3</sup> , period <sup>1</sup> , test <sup>1</sup> .
35-2b	2	arrange <sup>1</sup> , impossible <sup>1</sup> .
36-2b	1	really <sup>1</sup> .
37-2a	3	constant <sup>1</sup> , hence <sup>1</sup> , total <sup>2</sup> .
38-2a	1	fare <sup>1</sup> .
39-2a	1	term <sup>3</sup> .
40-2a	3	final <sup>2</sup> , represent <sup>2</sup> , support <sup>1</sup> .
41-2a	3	example <sup>3</sup> , satisfy <sup>1</sup> , system <sup>2</sup> .
42-2a	1	observe <sup>1</sup> .
43-2a	2	twice <sup>1</sup> , written <sup>1</sup> .
44-2a	3	character <sup>1</sup> , remove <sup>1</sup> , women <sup>1</sup> .
45-2a	1	sum <sup>3</sup> .
46-2a	4	dollar <sup>1</sup> , fifty <sup>1</sup> , rate <sup>1</sup> , root <sup>5</sup> .
47-2a	1	check <sup>3</sup> .
48-2a	4	according <sup>1</sup> , exact <sup>2</sup> , obtain <sup>1</sup> , result <sup>3</sup> .
50-1b	2	difference <sup>4</sup> , space <sup>1</sup> .
51-1b	6	amount <sup>2</sup> , cent <sup>2</sup> , entire <sup>1</sup> , exercise <sup>4</sup> , inch <sup>1</sup> , proper <sup>1</sup> .

Name	Age	Sex
John Smith	25	Male
Mary Jones	30	Female
Robert Brown	22	Male
Elizabeth White	28	Female
James Green	20	Male
Sarah Black	24	Female
William Grey	26	Male
Ann King	23	Female
Thomas Lee	21	Male
Margaret Hall	27	Female
Richard Young	24	Male
Elizabeth Scott	25	Female
George Adams	22	Male
Mary Baker	28	Female
John Wilson	20	Male
Sarah Miller	24	Female
Thomas Moore	26	Male
Elizabeth Taylor	23	Female
James Anderson	21	Male
Margaret Clark	27	Female
Richard Evans	24	Male
Elizabeth King	25	Female
George Scott	22	Male
Mary Adams	28	Female
John Baker	20	Male
Sarah Miller	24	Female
Thomas Moore	26	Male
Elizabeth Taylor	23	Female

Table 2 - continued.

<u>Index Number</u>	<u>Number of Different words</u>	<u>Words</u>
52-lb	1	member <sup>1</sup> .
53-lb	1	increase <sup>3</sup> .
54-lb	3	fact <sup>2</sup> , following <sup>7</sup> , height <sup>1</sup> .
55-lb	2	express <sup>5</sup> , usual <sup>1</sup> .
56-lb	2	contain <sup>2</sup> , single <sup>1</sup> .
57-lb	1	value <sup>6</sup> .
58-lb	5	boat <sup>1</sup> , manner <sup>1</sup> , simple <sup>1</sup> , themselves <sup>1</sup> , yard <sup>2</sup> .
59-lb	3	nine <sup>1</sup> , possible <sup>1</sup> , whether <sup>1</sup> .
60-lb	5	distance <sup>1</sup> , equal <sup>2</sup> , lot <sup>1</sup> , pair <sup>1</sup> , pound <sup>1</sup> .
62-lb	2	common <sup>1</sup> , direct <sup>1</sup> .
64-lb	1	square <sup>5</sup> .
65-lb	1	page <sup>1</sup> .
66-lb	1	count <sup>1</sup> .
67-lb	1	divide <sup>2</sup> .
68-lb	2	interest <sup>2</sup> , study <sup>1</sup> .
69-lb	1	travel <sup>2</sup> .
70-lb	1	cost <sup>3</sup> .
71-lb	2	thus <sup>2</sup> , wife <sup>1</sup> .
72-lb	1	whose <sup>3</sup> .
73-lb	1	seven <sup>1</sup> .
74-lb	1	question <sup>1</sup> .
75-la	2	add <sup>5</sup> , box <sup>1</sup> .
75-lb	1	rule <sup>1</sup> .
77-la5	1	case <sup>2</sup> .

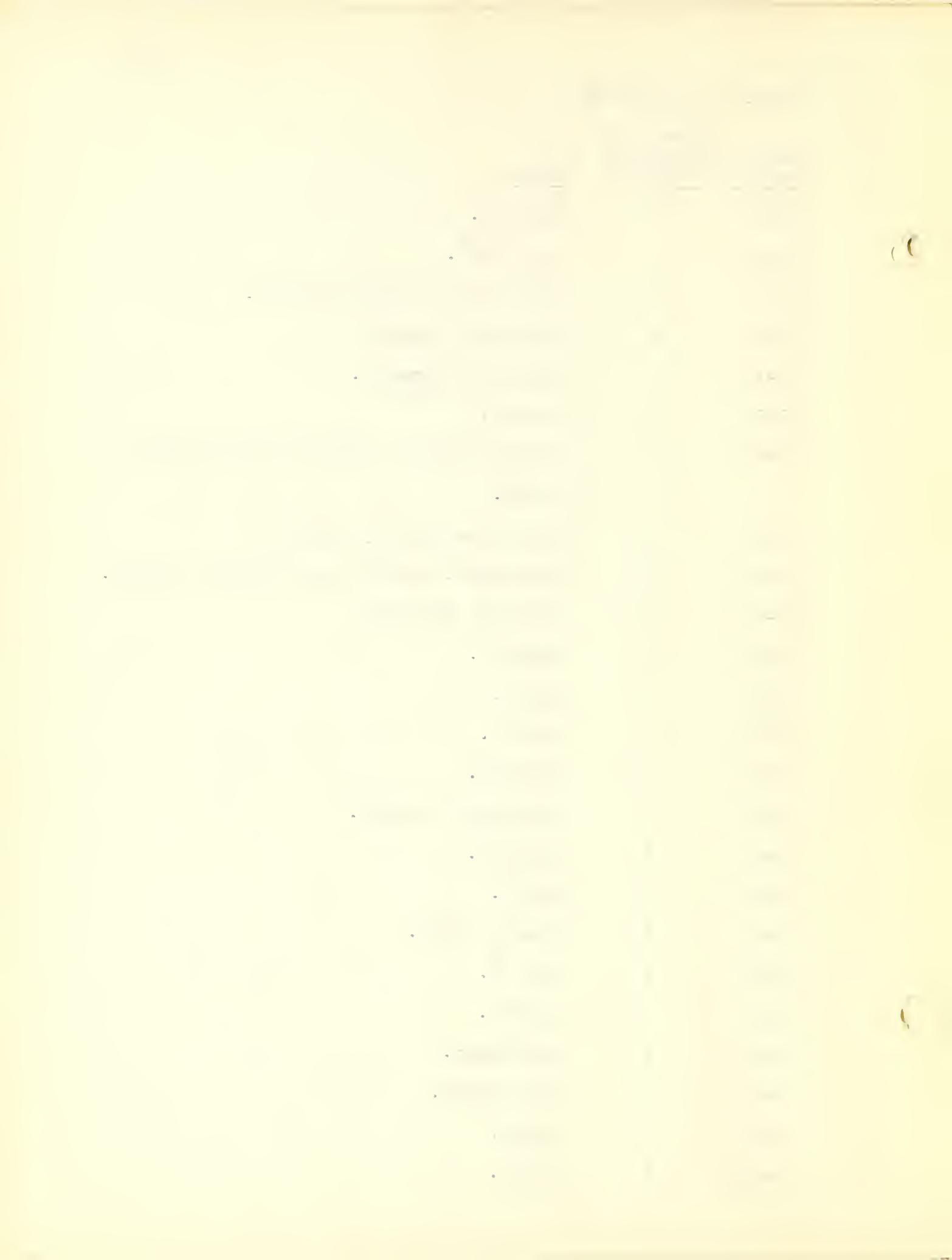




Table 2 - continued.

<u>Index Number</u>	<u>Number of Different Words</u>	<u>Words</u>
78-1a5	1	length <sup>1</sup> .
79-1a5	1	mile <sup>2</sup> .
80-1a5	1	known <sup>1</sup> .
81-1a5	2	general <sup>2</sup> , several <sup>1</sup> .
82-1a5	1	feet <sup>6</sup> .
83-1a5	1	bank <sup>1</sup> .
84-1a5	1	less <sup>1</sup> .
88-1a4	1	become <sup>1</sup> .
89-1a4	1	wide <sup>1</sup> .
90-1a4	2	though <sup>2</sup> , top <sup>1</sup> .
91-1a4	2	deep <sup>1</sup> , low <sup>1</sup> .
92-1a4	1	second <sup>4</sup> .
93-1a4	1	write <sup>1</sup> .
94-1a4	1	thousand <sup>1</sup> .
96-1a3	1	given <sup>4</sup> .
97-1a3	2	line <sup>3</sup> , she <sup>1</sup> .
98-1a3	2	done <sup>1</sup> , form <sup>4</sup> .
100-1a3	1	mean <sup>2</sup> .
101-1a3	2	above <sup>3</sup> , five <sup>2</sup> .
104-1a3	1	number <sup>10</sup> .
105-1a3	3	hour <sup>1</sup> , point <sup>3</sup> , round <sup>1</sup> .
106-1a3	1	hold <sup>1</sup> .
107-1a3	4	made <sup>1</sup> , state <sup>2</sup> , those <sup>1</sup> , without <sup>2</sup> .
108-1a3	1	since <sup>1</sup> .
109-1a3	1	follow <sup>1</sup> .

Date	Place	Remarks
1890	London	...
1891	London	...
1892	London	...
1893	London	...
1894	London	...
1895	London	...
1896	London	...
1897	London	...
1898	London	...
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2013	London	...
2014	London	...
2015	London	...
2016	London	...
2017	London	...
2018	London	...
2019	London	...
2020	London	...
2021	London	...
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2038	London	...
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2040	London	...
2041	London	...
2042	London	...
2043	London	...
2044	London	...
2045	London	...
2046	London	...
2047	London	...
2048	London	...
2049	London	...
2050	London	...

Table 2 - continued.

<u>Index Number</u>	<u>Number of Different Words</u>	<u>Words</u>
110-1a3	1	set <sup>1</sup> .
111-1a3	1	once <sup>1</sup> .
112-1a2	1	pass <sup>1</sup> .
114-1a2	3	book <sup>1</sup> , found <sup>3</sup> , its <sup>4</sup> .
115-1a2	3	both <sup>2</sup> , must <sup>5</sup> , run <sup>1</sup> .
117-1a2	2	even <sup>1</sup> , near <sup>2</sup> .
118-1a2	1	small <sup>1</sup> .
119-1a2	3	also <sup>1</sup> , between <sup>1</sup> , left <sup>1</sup> .
120-1a2	1	right <sup>2</sup> .
123-1a2	1	large <sup>1</sup> .
126-1a2	1	half <sup>1</sup> .
129-1a2	1	same <sup>2</sup> .
130-1a2	1	should <sup>1</sup> .
131-1a2	2	find <sup>10</sup> , side <sup>2</sup> .
132-1a2	1	let <sup>1</sup> .
136-1a2	2	first <sup>6</sup> , three <sup>2</sup> .
137-1a2	1	use <sup>4</sup> .
139-1a2	1	water <sup>1</sup> .
141-1a2	1	nigh <sup>1</sup> .
142-1a2	2	each <sup>4</sup> , these <sup>2</sup> .
145-1a2	2	give <sup>2</sup> , part <sup>1</sup> .
146-1a2	2	call <sup>2</sup> , has <sup>1</sup> .
149-1a2	1	may <sup>7</sup> .
151-1a1	3	two <sup>7</sup> , work <sup>1</sup> , year <sup>1</sup> .
153-1a1	1	many <sup>2</sup> .
155-1a1	1	here <sup>1</sup> .



Table 2 - continued.

<u>Index Number</u>	<u>Number of Different words</u>	<u>Words</u>
157-1a1	2	much <sup>1</sup> , than <sup>5</sup> .
158-1a1	1	any <sup>3</sup> .
159-1a1	3	been <sup>1</sup> , before <sup>1</sup> , great <sup>2</sup> .
162-1a1	1	take <sup>1</sup> .
163-1a1	1	into <sup>1</sup> .
166-1a1	3	where <sup>2</sup> , will <sup>1</sup> , would <sup>1</sup> .
167-1a1	2	more <sup>7</sup> , way <sup>1</sup> .
168-1a1	2	other <sup>2</sup> , over <sup>1</sup> .
170 - 1a1	1	we <sup>5</sup> .
171-1a1	1	how <sup>4</sup> .
172-1a1	2	about <sup>1</sup> , had <sup>1</sup> .
173-1a1	1	then <sup>3</sup> .
174-1a1	1	long <sup>2</sup> .
176-1a1	1	day <sup>2</sup> .
177-1a1	1	their <sup>2</sup> .
178-1a1	1	if <sup>5</sup> .
180-1a1	1	were <sup>1</sup> .
181-1a1	5	an <sup>8</sup> , or <sup>5</sup> , some <sup>1</sup> , them <sup>1</sup> , which <sup>7</sup> .
183-1a1	2	are <sup>9</sup> , time <sup>5</sup> .
187-1a1	1	is <sup>31</sup> .
188-1a1	2	was <sup>2</sup> , what <sup>11</sup> .
191-1a1	2	by <sup>16</sup> , this <sup>5</sup> .
193-1a1	2	out <sup>1</sup> , when <sup>5</sup> .
194-1a1	5	have <sup>7</sup> , he <sup>1</sup> , his <sup>2</sup> , there <sup>2</sup> , they <sup>4</sup> .
195-1a1	1	from <sup>6</sup> .

Year	...	...	...
1900	...	...	...
1901	...	...	...
1902	...	...	...
1903	...	...	...
1904	...	...	...
1905	...	...	...
1906	...	...	...
1907	...	...	...
1908	...	...	...
1909	...	...	...
1910	...	...	...
1911	...	...	...
1912	...	...	...
1913	...	...	...
1914	...	...	...
1915	...	...	...
1916	...	...	...
1917	...	...	...
1918	...	...	...
1919	...	...	...
1920	...	...	...
1921	...	...	...
1922	...	...	...
1923	...	...	...
1924	...	...	...
1925	...	...	...
1926	...	...	...
1927	...	...	...
1928	...	...	...
1929	...	...	...
1930	...	...	...
1931	...	...	...
1932	...	...	...
1933	...	...	...
1934	...	...	...
1935	...	...	...
1936	...	...	...
1937	...	...	...
1938	...	...	...
1939	...	...	...
1940	...	...	...
1941	...	...	...
1942	...	...	...
1943	...	...	...
1944	...	...	...
1945	...	...	...
1946	...	...	...
1947	...	...	...
1948	...	...	...
1949	...	...	...
1950	...	...	...
1951	...	...	...
1952	...	...	...
1953	...	...	...
1954	...	...	...
1955	...	...	...
1956	...	...	...
1957	...	...	...
1958	...	...	...
1959	...	...	...
1960	...	...	...
1961	...	...	...
1962	...	...	...
1963	...	...	...
1964	...	...	...
1965	...	...	...
1966	...	...	...
1967	...	...	...
1968	...	...	...
1969	...	...	...
1970	...	...	...
1971	...	...	...
1972	...	...	...
1973	...	...	...
1974	...	...	...
1975	...	...	...
1976	...	...	...
1977	...	...	...
1978	...	...	...
1979	...	...	...
1980	...	...	...
1981	...	...	...
1982	...	...	...
1983	...	...	...
1984	...	...	...
1985	...	...	...
1986	...	...	...
1987	...	...	...
1988	...	...	...
1989	...	...	...
1990	...	...	...
1991	...	...	...
1992	...	...	...
1993	...	...	...
1994	...	...	...
1995	...	...	...
1996	...	...	...
1997	...	...	...
1998	...	...	...
1999	...	...	...
2000	...	...	...

Table 2 - continued.

<u>Index Number</u>	<u>Number of Different Words</u>	<u>Words</u>
199-1a1	2	it <sup>5</sup> , one <sup>6</sup> .
200-1a1	1	on <sup>4</sup> .
201-1a1	1	for <sup>13</sup> .
203-1a1	2	all <sup>3</sup> , at <sup>9</sup> .
204-1a1	1	as <sup>13</sup> .
205-1a1	1	of <sup>47</sup> .
206-1a1	1	be <sup>10</sup> .
208-1a1	4	a <sup>17</sup> , the <sup>114</sup> , to <sup>16</sup> , with <sup>3</sup> .
209-1a1	1	that <sup>8</sup> .
210-1a1	1	and <sup>22</sup> .
211-1a1	1	in <sup>24</sup> .

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 329

Vocabulary Range - 329 words.

Zero-Value Words - 23 words.

Weighted Median Index-Number - 54-1b.





The following statistics from "Junior High School Mathematics - Third Course" - Vosburgh-Gentleman-Hassler - were obtained by the same method used for the preceding texts, except that since there were 282 pages in the book, the thousand-word sampling was got by taking four words from every even-numbered page through Page 260, and three words from every odd-numbered page through Page 261. Then from the last twenty pages four words were taken from every page. To make up the exact thousand, seven words, instead of four, were taken from the last page, which completed the total number.

Table 3 - Showing for "Junior High School Mathematics - Third Course" - Vosburgh-Gentleman-Hassler - the analysis of 1000 random words.

Column 1 gives the index-number, Column 2 gives the number of words, and Column 3 gives the separate words with exponents, indicating the number of times the words occur in the 1000 list.

<u>Index Number</u>	<u>Number of Different Words</u>	<u>Words</u>
0	28	Ahmes <sup>1</sup> , axiom <sup>2</sup> , centigrade <sup>1</sup> , cm. <sup>1</sup> , consecutive <sup>1</sup> , denominator <sup>1</sup> , electromotive <sup>1</sup> , eliminating <sup>1</sup> , elimination <sup>1</sup> , equation <sup>8</sup> , exponent <sup>1</sup> , fig. <sup>3</sup> , formula <sup>3</sup> , fulcrum <sup>1</sup> , halfway <sup>1</sup> , integer <sup>2</sup> , isosceles <sup>1</sup> , l.c.m. <sup>1</sup> , mid-points <sup>1</sup> , monomial <sup>2</sup> , perimeter <sup>1</sup> , protractor <sup>1</sup> , quadratic <sup>1</sup> , ratio <sup>2</sup> , simplify <sup>2</sup> , trinomial <sup>1</sup> , velocity <sup>1</sup> , vertex <sup>1</sup> .
3	5	accurate <sup>1</sup> , decimal <sup>1</sup> , motorist <sup>1</sup> , percentage <sup>1</sup> , pulley <sup>1</sup> .

Faint, illegible text in the upper section of the page, possibly a list or a series of entries.

Faint, illegible text in the middle section of the page, continuing the list or entries.

Faint, illegible text in the lower section of the page, possibly concluding the list or entries.

Table 3 - continued.

<u>Index Number</u>	<u>Number of Different Words</u>	<u>Words</u>
4	1	minus <sup>2</sup> .
5	4	acute <sup>1</sup> , circumference <sup>1</sup> , geometry <sup>1</sup> , radius <sup>2</sup> .
6	8	adjacent <sup>1</sup> , algebra <sup>1</sup> , arithmetic <sup>1</sup> , factor <sup>3</sup> , identify <sup>1</sup> , plus <sup>2</sup> , quotient <sup>2</sup> , verify <sup>1</sup> .
7	2	define <sup>2</sup> , kilometer <sup>1</sup> .
8	2	multiplication <sup>1</sup> , vertical <sup>2</sup> .
9	4	hemisphere <sup>1</sup> , suggestion <sup>1</sup> , triangle <sup>2</sup> , unit <sup>4</sup> .
10-5b	3	explanation <sup>1</sup> , solution <sup>8</sup> , thermometer <sup>1</sup> .
11-5b	1	rectangle <sup>1</sup> .
13-5a	4	expression <sup>1</sup> , fraction <sup>5</sup> , illustrate <sup>1</sup> , positive <sup>1</sup> .
14-4b	4	Bible <sup>1</sup> , correspond <sup>1</sup> , involve <sup>1</sup> , lb. <sup>1</sup> .
15-4b	4	angle <sup>9</sup> , drawn <sup>2</sup> , etc. <sup>1</sup> , plane <sup>2</sup> .
16-4a	3	bicycle <sup>1</sup> , statement <sup>2</sup> , substitute <sup>2</sup> .
17-4a	1	overtake <sup>1</sup> .
18-4a	2	chapter <sup>1</sup> , revolution <sup>1</sup> .
19-3b	2	combination <sup>1</sup> , transport <sup>1</sup> .
20-3b	2	remainder <sup>1</sup> , solve <sup>5</sup> .
21-3b	4	application <sup>1</sup> , examination <sup>1</sup> , similar <sup>1</sup> , temperature <sup>1</sup> .
23-3a	5	cell <sup>1</sup> , electric <sup>1</sup> , locate <sup>1</sup> , problem <sup>1</sup> , process <sup>2</sup> .
24-3a	5	blank <sup>1</sup> , column <sup>1</sup> , method <sup>2</sup> , multiply <sup>3</sup> , relate <sup>1</sup> .
25-3a	2	area <sup>5</sup> , exceed <sup>2</sup> .
26-3a	3	division <sup>1</sup> , type <sup>1</sup> , vary <sup>1</sup> .



Table 3 - continued.

<u>Index Number</u>	<u>Number of Different Words</u>	<u>Words</u>
27-3a	2	conclude <sup>1</sup> , pitch <sup>1</sup> .
28-3a	1	neighborhood <sup>1</sup> .
28-2b	2	brass <sup>1</sup> , volume <sup>2</sup> .
29-2b	2	flight <sup>1</sup> , occur <sup>1</sup> .
30-2b	3	axe <sup>1</sup> , candy <sup>1</sup> , error <sup>1</sup> .
31-2b	2	grade <sup>1</sup> , per <sup>2</sup> .
32-2b	2	metal <sup>1</sup> , proof <sup>1</sup> .
33-2b	2	automobile <sup>1</sup> , product <sup>1</sup> .
34-2b	1	rode <sup>1</sup> .
35-2b	1	Heap <sup>1</sup> .
36-2a	1	trace <sup>1</sup> .
36-2b	1	rope <sup>1</sup> .
37-2a	4	connect <sup>1</sup> , frequent <sup>1</sup> , hence <sup>1</sup> , total <sup>1</sup> .
38-2a	2	proceed <sup>1</sup> , respect <sup>2</sup> .
39-2a	4	apart <sup>1</sup> , explain <sup>1</sup> , flour <sup>1</sup> , term <sup>2</sup> .
40-2a	1	final <sup>1</sup> .
41-2a	3	example <sup>4</sup> , quantity <sup>2</sup> , slight <sup>1</sup> .
42-2a	1	trunk <sup>1</sup> .
43-2a	4	degree <sup>1</sup> , mention <sup>1</sup> , twice <sup>1</sup> , weigh <sup>1</sup> .
45-2a	2	mix <sup>1</sup> , sum <sup>3</sup> .
46-2a	5	consider <sup>1</sup> , plate <sup>2</sup> , rate <sup>2</sup> , root <sup>3</sup> , scale <sup>1</sup> .
47-2a	1	check <sup>5</sup> .
48-2a	3	base <sup>1</sup> , compare <sup>1</sup> , exact <sup>1</sup> .
49-2a	1	stretch <sup>1</sup> .
51-1b	4	amount <sup>2</sup> , cent <sup>2</sup> , complete, <sup>2</sup> inch <sup>2</sup> .

Year	Month	Day	Event
1880	Jan	1	...
1880	Jan	2	...
1880	Jan	3	...
1880	Jan	4	...
1880	Jan	5	...
1880	Jan	6	...
1880	Jan	7	...
1880	Jan	8	...
1880	Jan	9	...
1880	Jan	10	...
1880	Jan	11	...
1880	Jan	12	...
1880	Jan	13	...
1880	Jan	14	...
1880	Jan	15	...
1880	Jan	16	...
1880	Jan	17	...
1880	Jan	18	...
1880	Jan	19	...
1880	Jan	20	...
1880	Jan	21	...
1880	Jan	22	...
1880	Jan	23	...
1880	Jan	24	...
1880	Jan	25	...
1880	Jan	26	...
1880	Jan	27	...
1880	Jan	28	...
1880	Jan	29	...
1880	Jan	30	...
1880	Jan	31	...
1880	Feb	1	...
1880	Feb	2	...
1880	Feb	3	...
1880	Feb	4	...
1880	Feb	5	...
1880	Feb	6	...
1880	Feb	7	...
1880	Feb	8	...
1880	Feb	9	...
1880	Feb	10	...
1880	Feb	11	...
1880	Feb	12	...
1880	Feb	13	...
1880	Feb	14	...
1880	Feb	15	...
1880	Feb	16	...
1880	Feb	17	...
1880	Feb	18	...
1880	Feb	19	...
1880	Feb	20	...
1880	Feb	21	...
1880	Feb	22	...
1880	Feb	23	...
1880	Feb	24	...
1880	Feb	25	...
1880	Feb	26	...
1880	Feb	27	...
1880	Feb	28	...
1880	Feb	29	...
1880	Mar	1	...
1880	Mar	2	...
1880	Mar	3	...
1880	Mar	4	...
1880	Mar	5	...
1880	Mar	6	...
1880	Mar	7	...
1880	Mar	8	...
1880	Mar	9	...
1880	Mar	10	...
1880	Mar	11	...
1880	Mar	12	...
1880	Mar	13	...
1880	Mar	14	...
1880	Mar	15	...
1880	Mar	16	...
1880	Mar	17	...
1880	Mar	18	...
1880	Mar	19	...
1880	Mar	20	...
1880	Mar	21	...
1880	Mar	22	...
1880	Mar	23	...
1880	Mar	24	...
1880	Mar	25	...
1880	Mar	26	...
1880	Mar	27	...
1880	Mar	28	...
1880	Mar	29	...
1880	Mar	30	...
1880	Mar	31	...
1880	Apr	1	...
1880	Apr	2	...
1880	Apr	3	...
1880	Apr	4	...
1880	Apr	5	...
1880	Apr	6	...
1880	Apr	7	...
1880	Apr	8	...
1880	Apr	9	...
1880	Apr	10	...
1880	Apr	11	...
1880	Apr	12	...
1880	Apr	13	...
1880	Apr	14	...
1880	Apr	15	...
1880	Apr	16	...
1880	Apr	17	...
1880	Apr	18	...
1880	Apr	19	...
1880	Apr	20	...
1880	Apr	21	...
1880	Apr	22	...
1880	Apr	23	...
1880	Apr	24	...
1880	Apr	25	...
1880	Apr	26	...
1880	Apr	27	...
1880	Apr	28	...
1880	Apr	29	...
1880	Apr	30	...
1880	Apr	30	...



Table 3 - continued.

<u>Index Number</u>	<u>Number of Different Words</u>	<u>Words</u>
52-lb	2	fourth <sup>1</sup> , report <sup>1</sup> , roof <sup>1</sup> .
54-lb	4	following <sup>1</sup> , height <sup>1</sup> , row <sup>1</sup> , subject <sup>1</sup> .
55-lb	3	express <sup>1</sup> , post <sup>1</sup> , trade <sup>1</sup> .
56-lb	2	contain <sup>2</sup> , weight <sup>1</sup> .
57-lb	3	cool <sup>1</sup> , sign <sup>4</sup> , value <sup>1</sup> .
58-lb	1	bottom <sup>1</sup> .
60-lb	3	equal <sup>4</sup> , pair <sup>2</sup> , pound <sup>4</sup> .
63-lb	1	prove <sup>2</sup> .
64-lb	2	force <sup>1</sup> , square <sup>7</sup> .
65-lb	1	note <sup>1</sup> .
67-lb	2	bill <sup>1</sup> , divide <sup>3</sup> .
68-lb	4	figure <sup>4</sup> , interest <sup>1</sup> , sell <sup>1</sup> , study <sup>1</sup> .
69-lb	2	office <sup>1</sup> , travel <sup>1</sup> .
70 -lb	1	cost <sup>3</sup> .
72-lb	2	plan <sup>1</sup> , whose <sup>3</sup> .
74-lb	2	ago <sup>1</sup> , lie <sup>2</sup> .
77-1a5	3	case <sup>1</sup> , certain <sup>2</sup> , sight <sup>1</sup> .
78-1a5	1	length <sup>1</sup> .
79-1a5	3	fast <sup>1</sup> , measure <sup>1</sup> , mile <sup>2</sup> .
80-1a5	2	known <sup>1</sup> , remain <sup>1</sup> .
82-1a5	1	feet <sup>4</sup> .
84-1a5	3	less <sup>1</sup> , story <sup>1</sup> , window <sup>1</sup> .
85-1a4	1	power <sup>1</sup> .
86-1a4	1	often <sup>1</sup> .
88-1a4	2	clear <sup>1</sup> , third <sup>2</sup> .
89-1a4	1	draw <sup>1</sup> .



Table 3 - continued.

<u>Index Number</u>	<u>Number of Different Words</u>	<u>words</u>
90-1a4	2	ground <sup>1</sup> , ten <sup>1</sup> .
91-1a4	4	answer <sup>3</sup> , being <sup>1</sup> , piece <sup>1</sup> , six <sup>1</sup> .
92-1a4	3	field <sup>1</sup> , paper <sup>1</sup> , second <sup>2</sup> .
93-1a4	1	letter <sup>1</sup> .
94-1a4	1	fill <sup>1</sup> .
96-1a3	2	during <sup>1</sup> , given <sup>1</sup> .
97-1a3	1	next <sup>2</sup> .
98-1a3	4	cover <sup>1</sup> , form <sup>1</sup> , late <sup>1</sup> , room <sup>1</sup> .
99-1a3	3	few <sup>1</sup> , foot <sup>1</sup> , Kings <sup>1</sup> .
100-1a3	1	mean <sup>2</sup> .
101-1a3	2	change <sup>3</sup> , does <sup>3</sup> .
104-1a3	1	number <sup>15</sup> .
105-1a3	3	close <sup>1</sup> , hour <sup>2</sup> , point <sup>5</sup> .
107-1a3	1	state <sup>1</sup> .
108-1a3	2	because <sup>1</sup> , since <sup>1</sup> .
109-1a3	3	follow <sup>3</sup> , money <sup>1</sup> , read <sup>1</sup> .
114-1a2	2	found <sup>1</sup> , its <sup>3</sup> .
115-1a2	2	must <sup>1</sup> , run <sup>1</sup> .
116-1a2	1	another <sup>1</sup> .
117-1a2	1	near <sup>3</sup> .
118-1a2	1	small <sup>2</sup> .
119-1a2	2	between <sup>3</sup> , left <sup>1</sup> .
120-1a2	1	right <sup>1</sup> .
122-1a2	1	boy <sup>2</sup> .
123-1a2	2	large <sup>3</sup> , show <sup>2</sup> .
124-1a2	2	think <sup>1</sup> , turn <sup>1</sup> .



Table 3 - continued.

<u>Index Number</u>	<u>Number of Different Words</u>	<u>Words</u>
129-1a2	1	same <sup>4</sup> .
131-1a2	2	find <sup>15</sup> , side <sup>2</sup> .
132-1a2	1	head <sup>1</sup> .
136-1a2	3	first <sup>2</sup> , get <sup>1</sup> , three <sup>2</sup> .
137-1a2	1	use <sup>10</sup> .
138-1a2	1	I <sup>1</sup> .
139-1a2	1	water <sup>2</sup> .
140-1a2	1	say <sup>1</sup> .
142-1a2	2	each <sup>7</sup> , these <sup>1</sup> .
145-1a2	1	give <sup>1</sup> .
146-1a2	1	has <sup>1</sup> .
148-1a2	1	hand <sup>1</sup> .
149-1a2	1	may <sup>1</sup> .
151-1a1	3	two <sup>11</sup> , work <sup>4</sup> , year <sup>3</sup> .
153-1a1	1	many <sup>3</sup> .
155-1a1	1	old <sup>2</sup> .
156-1a1	1	place <sup>1</sup> .
157-1a1	4	much <sup>1</sup> , such <sup>1</sup> , than <sup>1</sup> , thing <sup>1</sup> .
158-1a1	1	any <sup>2</sup> .
159-1a1	2	been <sup>2</sup> , before <sup>1</sup> , your <sup>2</sup> .
160-1a1	1	new <sup>1</sup> .
162-1a1	1	take <sup>2</sup> .
163-1a1	1	can <sup>5</sup> .
166-1a1	1	will <sup>6</sup> .
167-1a1	1	more <sup>6</sup> .
168-1a1	1	other <sup>2</sup> .



Table 3 - continued.

<u>Index Number</u>	<u>Number of Different Words</u>	<u>words</u>
170-1a1	1	we <sup>2</sup> .
171-1a1	1	how <sup>7</sup> .
172-1a1	1	about <sup>1</sup> .
173-1a1	1	then <sup>4</sup> .
174-1a1	1	long <sup>2</sup> .
175-1a1	1	man <sup>2</sup> .
176-1a1	2	day <sup>1</sup> , make <sup>4</sup> .
177-1a1	1	their <sup>3</sup> .
178-1a1	1	if <sup>4</sup> .
180-1a1	2	do <sup>1</sup> , were <sup>1</sup> .
181-1a1	5	an <sup>5</sup> , or <sup>4</sup> , some <sup>1</sup> , them <sup>1</sup> , which <sup>2</sup> .
183-1a1	2	are <sup>9</sup> , time <sup>3</sup> .
187-1a1	1	is <sup>29</sup> .
188-1a1	4	so <sup>3</sup> , was <sup>2</sup> , what <sup>9</sup> , you <sup>3</sup> .
191-1a1	2	by <sup>12</sup> , this <sup>3</sup> .
193-1a1	2	out <sup>1</sup> , when <sup>3</sup> .
194-1a1	5	have <sup>7</sup> , he <sup>3</sup> , his <sup>1</sup> , there <sup>1</sup> , they <sup>3</sup> .
195-1a1	1	from <sup>5</sup> .
199-1a1	2	it <sup>4</sup> , one <sup>7</sup> .
200-1a1	1	on <sup>4</sup> .
201-1a1	1	for <sup>9</sup> .
203-1a1	3	all <sup>4</sup> , at <sup>1</sup> , not <sup>1</sup> .
204-1a1	1	as <sup>5</sup> .
205-1a1	1	of <sup>54</sup> .
206-1a1	1	be <sup>7</sup> .
208-1a1	4	a <sup>34</sup> , the <sup>119</sup> , to <sup>16</sup> , with <sup>2</sup> .



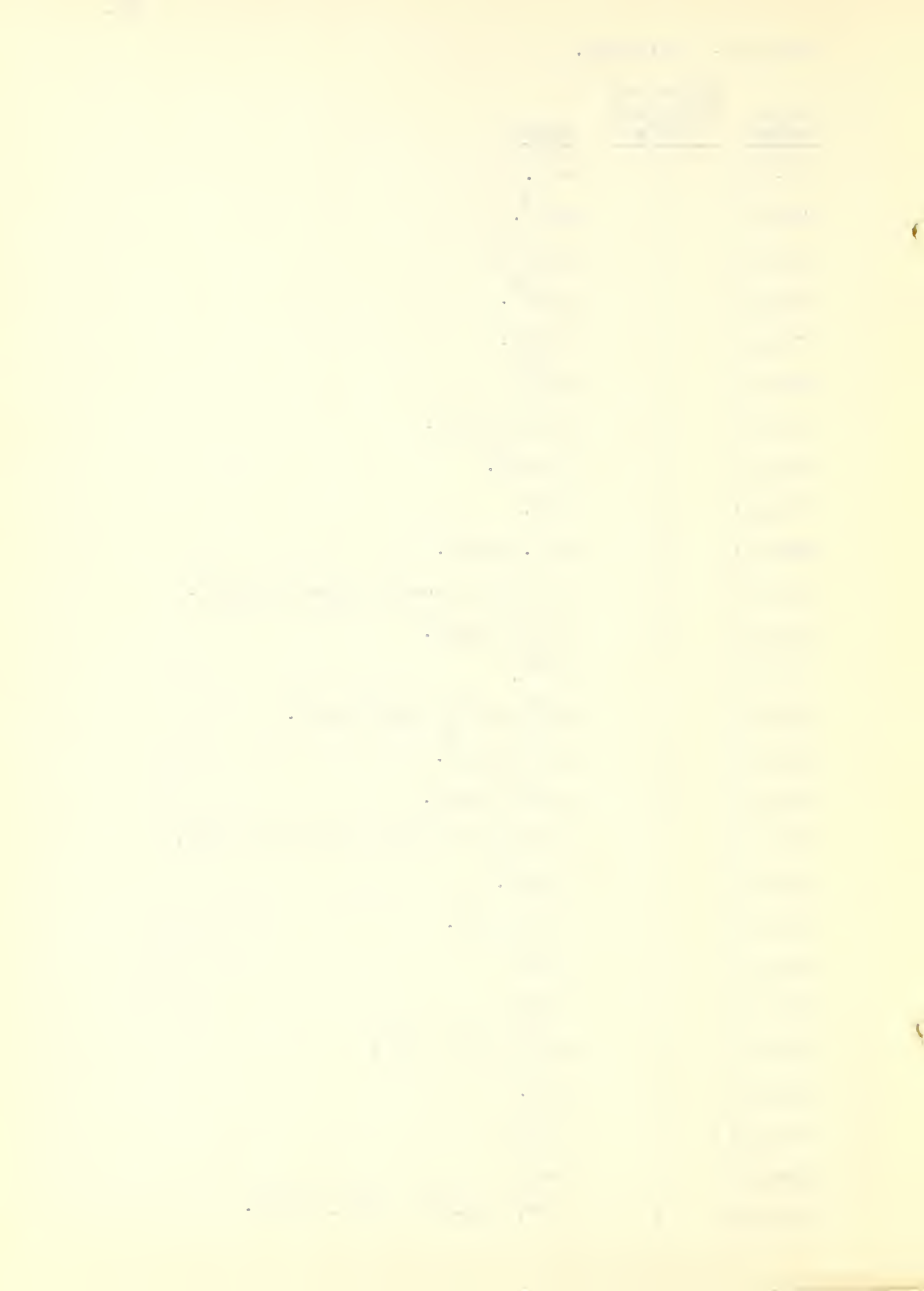


Table 3 - continued.

<u>Index Number</u>	<u>Number of Different Words</u>	<u>Words</u>
209-1a1	1	that <sup>8</sup> .
210-1a1	1	and <sup>28</sup> .
211-1a1	1	in <sup>27</sup> .

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343

Vocabulary Range - 343 words.

Zero-Value Words - 28 words.

Weighted Median Index-Number - 54-1b.



## 2. Results.

## (a) Summary.

A summary of the preceding statistics for the three texts is as follows:

Table 4- Showing Tables 1, 2, and 3 Summarized.

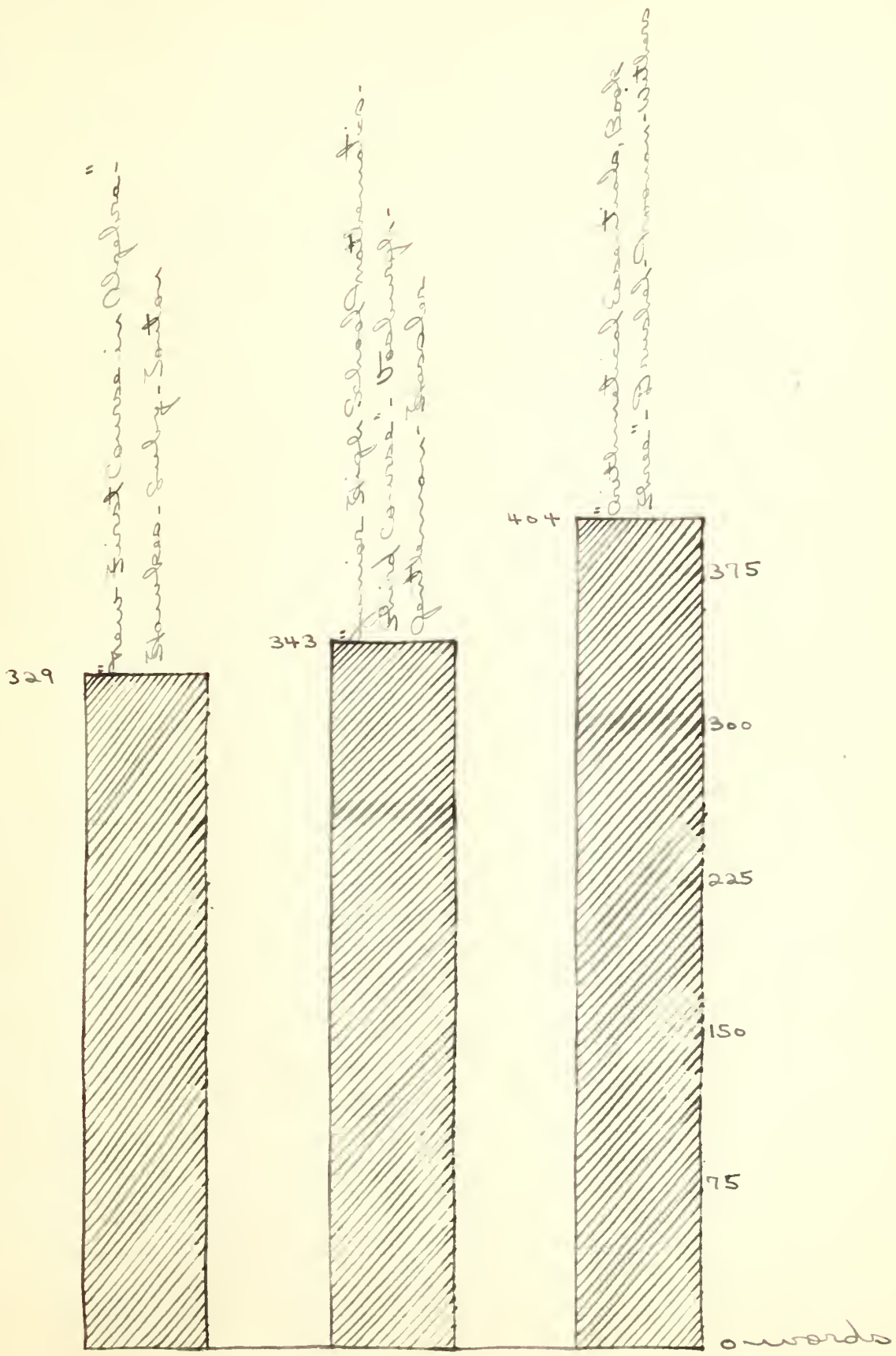
<u>One Count</u>	<u>Vocabulary Range</u>	<u>Zero-Value Words</u>	<u>Weighted Median Index-Number</u>
"Arithmetic Essentials - Book Three" - Drushel-Noonan-Withers - <i>Arithmetic</i>	404 words	25 words	50-lb
"New First Course in Algebra" - Hawkes-Luby-Touton - <i>Algebra</i>	329 words	23 words	54-lb
"Junior High School Mathematics - Third Course" - Vosburgh-Gentleman-Hassler - <i>Math</i>	343 words	28 words	54-lb

## (b) Graphs.

The accompanying graphs represent the foregoing results relatively. As will be seen at a glance, there is a perceptible difference in the range of the vocabularies of the three texts studied, whereas, there is only a small variation in the numbers of zero-value words used and in the weighted median index-numbers.

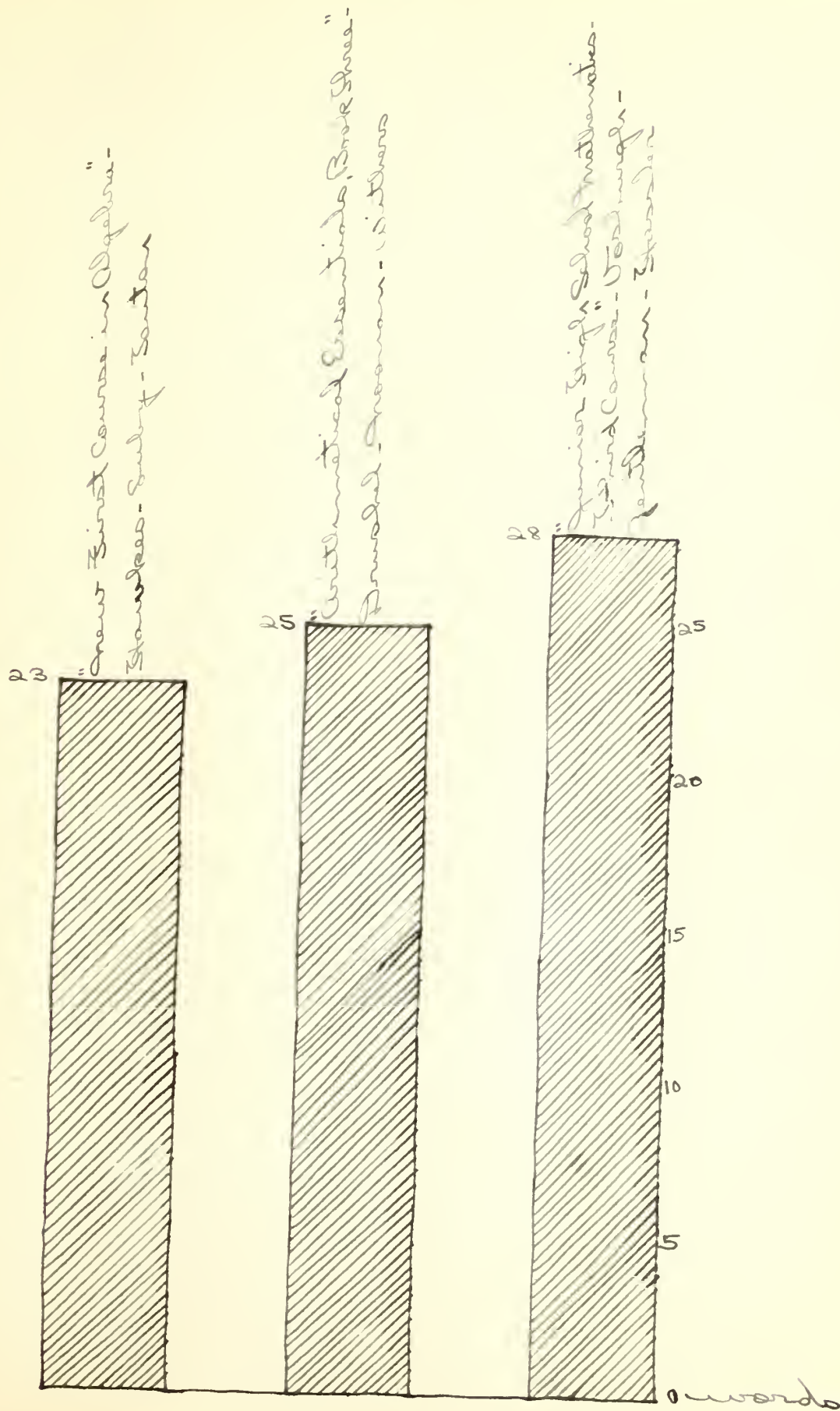


# Comparative Range of Vocabulary



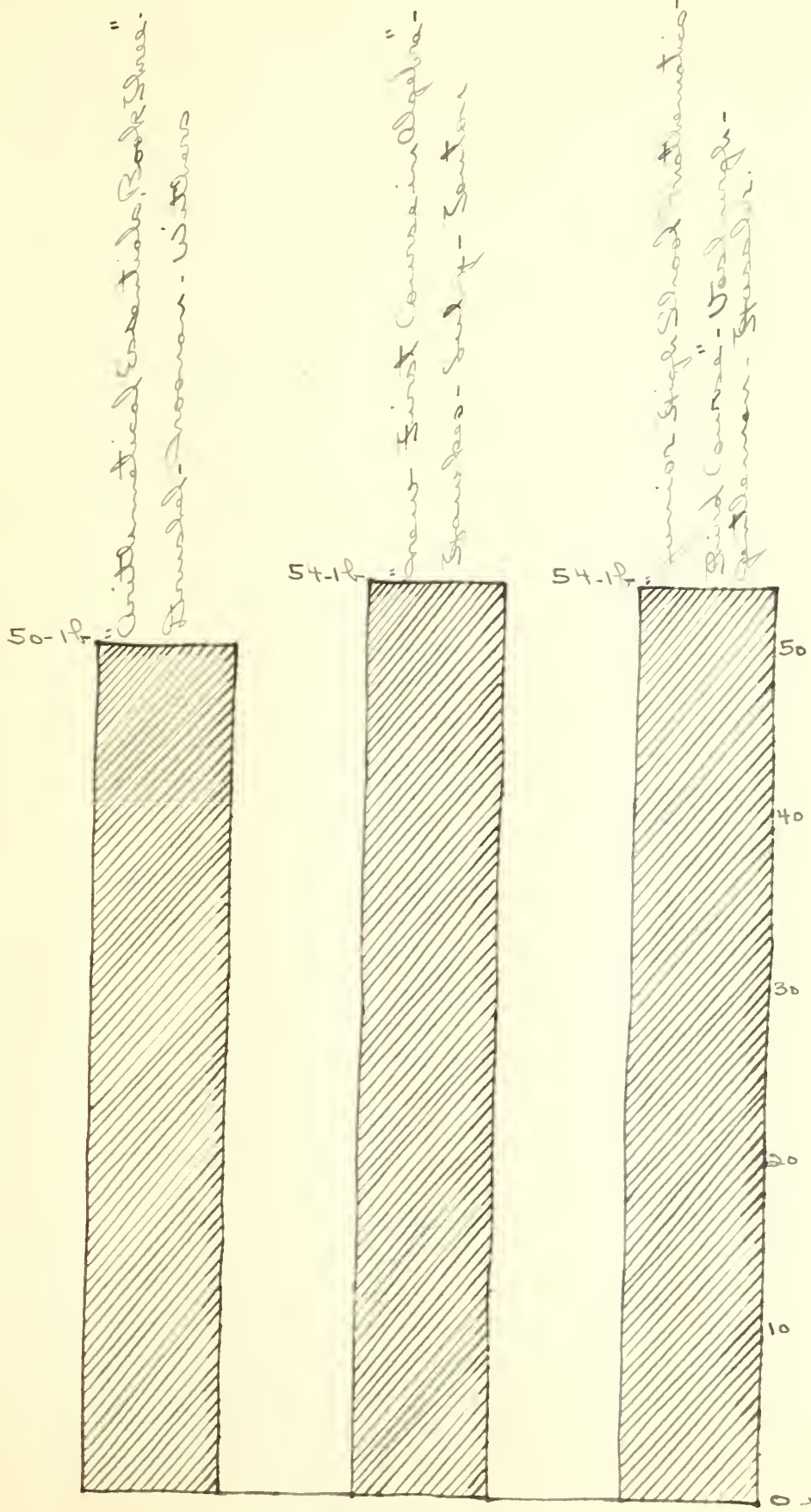


Comparative number of zero-valued words









Index Number



### 3. Conclusions.

From the results of such a Vocabulary Burden study, six main conclusions may be drawn. First, that whereas great progress has been made in the last few years in improving text books in this respect, there is still need of further simplification and elimination. In the three recent texts studied - the oldest of them published only six years ago - 1921 ("Arithmetical Essentials - Book Three" - Drushel-Noonan-Withers), while "Junior High School Mathematics - Third Course" - Vosburgh-Gentleman-Hassler, revised edition was published in 1924, and "New First Course in Algebra" - Hawkes-Luby-Touton - in 1925 - just two years ago - the vocabulary range for all of them is unquestionably too high. And can there be any justification for the fact that the Drushel-Noonan-Withers text, which is to be used in the Seventh and Eight Grades, has a vocabulary range larger by 75 words, or 22%, than the Hawkes-Luby-Touton book used in Eighth and Ninth Grades, and larger by 61 words, or 17%, than the Vosburgh-Gentleman-Hassler text for use in the Ninth Grade? Certainly a Seventh & Eighth Grade book should have a far lower vocabulary range than a Ninth Grade text. In fact, any mathematics text should have as simple a vocabulary as possible, so that there would be practically no word-burden, since the subject matter itself is quite difficult enough without added language obstacles.

Second, there is no excuse in Junior High School Mathematics books for any words so abstract that they are



not to be found among the 10000 most commonly used. Since such words do not function in ordinary adult life, may they not indicate some non-essentials in general Mathematics teaching which ought to be eliminated? With school mortality so high, it is little short of criminal to waste the pupils' time with subject matter useful only to the expert. In the three texts used for this study, the number of zero-value words was 6% of the vocabulary range in the Drushel-Noonan-Withers book; 6% of the Hawkes-Luby-Touton vocabulary range; and 8% of the Vosburgh-Gentleman-Hassler range.

These words were in the Drushel book:

annum, arc, bisect, Boyd, Bros., Chapin, convex, diphtheria, Feb., graph, Grimes, inventory, isosceles, Lake Superior, Minneapolis, oblong, Ogden, parentheses, perimeter, polygon, Spalding, Stanford. St. Mary's River, trapezoid, vertex.

The Hawkes text had:

axiom, binomial, coefficient, denominator, digits, equation, exponents, half-dollars, half-fare, integer, literal, numerator, one-digit, polynomial, quadratic, ratio, sheet-metal, simplify, tangent, transposing, transposition, two-digit.

In Vosburgh were found:

Ahmes, centigrade, cm., consecutive, electromotive, eliminating, elimination, fig., formula, fulcrum, halfway, I.C.M., mid-points, monomial, protractor, trinomial, velocity-

*a suggestive list involving a number of mathematical processes.*

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If to the number of zero-value words there were added the number of low-value words (those not included in the 5000 most important words) in each of the three texts analyzed, it would be found that the number in each case is about doubled, which considerably intensifies the vocabulary difficulty, and indicates the magnitude of the language handicap with which pupils are hampered in their general mathematics work.

Third, the distribution of difficult words in the three texts studied is too heavy at the beginning and in the first part of the books. In the following tabulation, giving the number of zero-value words and low-value words found within hundred-page units, it will be seen that in the Drushel-Noonan-Withers text more than three times as many of the difficult words appear in the first two-thirds of the book; while in the Hawkes-Luby-Touton book there are one-fourth more of the difficult words in the first half than in the last half; and in the Vosburgh-Gentleman-Hassler text the distribution is about even, so that twice as many of the difficult words are found in the first two-thirds of the book as in the last third. Consequently, is not the Vocabulary Burden made just that much greater, whereas, should not the pupils be as free as possible from such a burden in the beginning of new work, and should not the difficult words be distributed in gradually increasing numbers with the weight toward the end of the text rather than at the beginning?





Table 5 - Showing the Distribution of Difficult Words  
 in "Arithmetical Essentials, Book Three" -  
 Drushel-Noonan-Withers.

The numbers indicate the pages on which the words occur.

<u>Zero-Value Words</u>	<u>Low-Value Words - (through 9)</u>
Page 272	Page 215
129	151
126	171
113	183
86	186
217	231
262	103
136	24
95	284
29	81
55	23
71	193
5	222
24	281
60	162
175	49
211	128
30	82
74	83
228	138
21	54
27	52
119	163
217	22
243	42
211	91
127	173
127	208
114	107
	293
	191
	110
	253
	29
	40
	63
	175
	140
	197



Table 6 - Showing the Distribution of Difficult Words  
 in "New First Course in Algebra" -  
 Hawkes-Luby-Touton.

The numbers indicate the pages on which the words occur.

<u>Zero-Value Words</u>	<u>Low-Value Words</u> - (through 9)
Page 57	Page 346
143	41
58	113
119	221
174	41
194	208
225	277
187	87
217	269
267	223
56	27
72	249
73	155
169	298
215	108
224	126
120	148
170	189
264	208
319	190
284	135
281	159
106	197
82	108
302	162
72	183
136	208
185	251
198	331
210	47
204	91
291	228
111	345
172	273
299	30
287	47
45	70
87	71
211	297
343	279
100	345
75	350
291	65



Table 7 - Showing the Distribution of Difficult Words  
in "Junior High School Mathematics - Third  
Course" - Vosburgh-Gentleman-Hassler.

The numbers indicate the pages on which the words occur.

<u>zero-Value Words</u>	<u>Low-Value Words - (Through 9)</u>
Page 74	Page 119
16	262
19	209
85	130
193	236
248	42
179	208
233	215
166	255
169	100
15	133
16	136
71	138
83	68
14	130
71	279
180	106
199	131
122	150
263	27
268	4
116	102
6	126
231	45
1	41
52	146
57	63
10	67
248	205
273	273
244	262
265	25
133	226
136	24
38	80
270	270
180	226
13	259
201	
242	
2	
134	
229	
273	



Table 8 - Showing a Summary of Tables 5, 6 and 7.

Distribution of Difficult wordsDrushel-Noonan-Withers.

	<u>P. 1-99</u>	<u>P. 100-199</u>	<u>P.200-296</u>
Zero-Value Words	12	9	8
Low-Value Words	<u>14</u>	<u>17</u>	<u>8</u>
	<u>26</u>	<u>26</u>	<u>16</u>

Hawkes-Luby-Touton.

	<u>P. 1-99</u>	<u>P.100-199</u>	<u>P.200-299</u>	<u>P.300-357</u>
Zero-Value Words	10	15	15	3
Low-Value Words	<u>11</u>	<u>13</u>	<u>14</u>	<u>5</u>
	<u>21</u>	<u>28</u>	<u>29</u>	<u>8</u>

Vosburgh-Gentleman-Hassler.

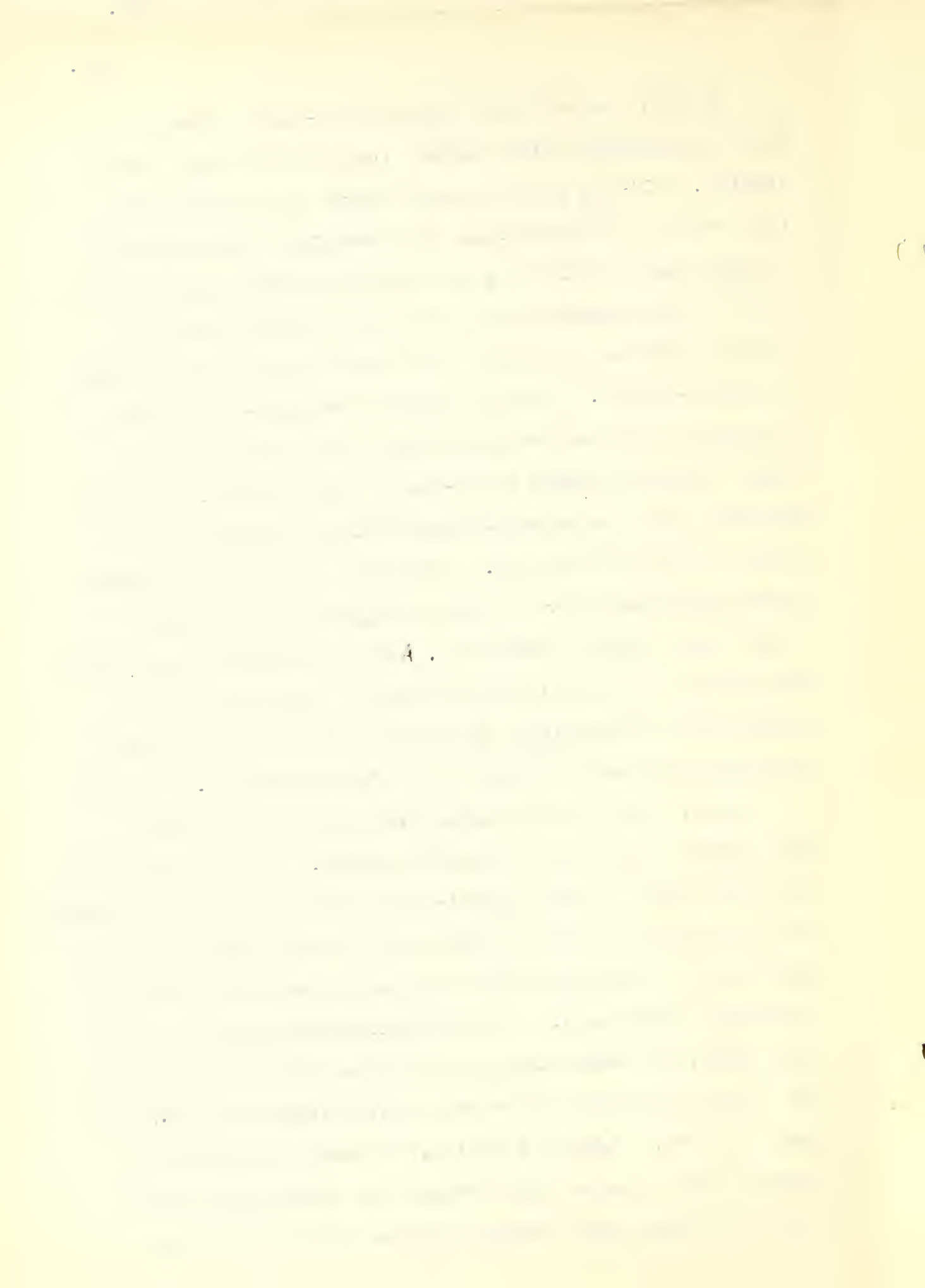
	<u>P. 1-99</u>	<u>P. 100-199</u>	<u>P. 200-282</u>
Zero-Value Words	18	12	14
Low-Value Words	<u>11</u>	<u>13</u>	<u>14</u>
	<u>29</u>	<u>25</u>	<u>28</u>





Fourth, the weighted median index-number should be higher than 54-lb - the highest found in the three texts studied. 211-1a1 is the highest given in the Thorndike list, and if the zero-value and low-value words were for the most part eliminated, the weighted median index-number could be appreciably raised, since it varies inversely with the vocabulary range - the less the range, the higher the index-number. Granted that the Vosburgh-Gentleman-Hassler and the Hawkes-Luby-Touton texts should have a higher weighted median index-number than 54-lb, it will be apparent that the Drushel-Moonan-Withers index-number - 50-lb - is by far too low. Certainly a Seventh and Eighth Grade text should have a higher weighted median index-number than a Ninth Grade book. And every Junior High School Mathematics text should have as high a weighted median index-number as possible, indicating that the vocabulary difficulty has been reduced to the lowest minimum.

Fifth, there is not enough vocabulary over-lapping from grade to grade in the texts studied. In the statistics the words found in the Drushel-Moonan-withers book were checked, and it was found that only 132 words, or 40%, of the Hawkes-Luby-Touton vocabulary range was found also in the seventh and Eighth grade book. In the Vosburgh-Gentleman-Hassler statistics, the words used in all three texts were checked, and it was found that there was an over-lapping of only 200 words, or 57%. This is too high, of course, because the Drushel text includes both seventh and Eighth grade work, while the Hawkes book includes Eighth and Ninth grades,



but it serves to give some idea of how little actual over-lapping there is in texts covering the three years of Junior High School Mathematics. When it is taken into consideration that somewhat more than two-thirds of the Hawkes-Luby-Touton vocabulary range was new, and that more than half of the Vosburgh-Gentleman-Hassler range was new, it will be seen how much heavier the Vocabulary Burden is made due to lack of sufficient over-lapping. There should be as much over-lapping in vocabulary ranges as possible, in order that the pupils may not be at the disadvantage of having to hurdle language obstacles as well as those of subject matter.

And finally it will be of interest to note the type of words found in the samplings. In the Drushel-Noonan-Withers text appear such words as - assessed, compensation, corporations, degrees, discount, inventory, isosceles, legal, levy, polygon, reservoir, trapezoid, vertex, etc., while boys is found once, children twice, home once, pupils twice, sells twice, and store once. But in general it is an adult vocabulary - little suited to the interests of the world of youth. For instance, the words father, mother, brother, sister - even girl, dog, cat, horse, bicycle, radio, football, baseball, hockey, basketball, marbles, clothes, etc., covering so many of the interests of childhood and youth do not appear at all. In the Hawkes-Luby-Touton sampling are found - acute, altitude, angle, area, axiom, axis, binomial, coefficient, digits, linear, polynomial, quadratic, thermometer, transposing, unknown,



etc., while books is used once, student once, and women once, but for the most part the vocabulary is not even a common adult one, and has little or no reference to the interests of the pupils. The Vosburgh-Gentleman-Hassler thousand-word unit contains: Ahmes, axiom, centigrade, circumferences, consecutive, formula, fulcrum, geometric, hemispherical, identities, isosceles, kilometer, monomial, protractor, quadratic, trinomial, velocity, etc., while automobile is used once, bicycle once, boys twice, electric once, and neighborhood once; however, the vocabulary is largely an adult and technical one, little motivated by the interests of the pupils.

From the foregoing discussion, it will be seen that in these three Junior High School Mathematics texts, which have been analyzed, the Vocabulary Burden is a burden, indeed - real and heavy, making much more difficult an already difficult subject. It is necessary to conclude that results in Mathematics teaching will not improve appreciably until the Vocabulary Burden of text books is much lightened or adapted to <sup>pupil</sup>~~child~~ interests and needs, for teachers now are forced to spend invaluable energy and time clearing away vocabulary difficulties, and pupils grope around blindly amid perplexing language intricacies, losing time and eventually interest, because they find the book so puzzling and dull. The vocabulary of the Junior High School text should be suited to the interests and needs of the pupils, as well as to adult needs, and not to those of the experts.





### III. Summary.

From such a Vocabulary Burden study, six conclusions follow. First, that the vocabulary range of the three texts is too high. There should be much simplification and elimination. Second, that there should be no zero-value words in a Junior High School Mathematics text. The presence of such words in the texts studied quite probably indicates useless processes which should be dropped out, and the work put on a functional basis of pupil-interests and needs, as well as adult needs. Third, the distribution of difficult words should be gradual with the weight toward the end of the book, rather than at the beginning, as was found to be the case in the texts studied. Fourth, the weighted median index-number in the three texts is too low, indicating much vocabulary difficulty. It should be as high as possible, denoting a simple, easy vocabulary. Fifth, there is too little over-lapping in the vocabularies of the Seventh, Eighth, and Ninth Grade texts examined. There should be much over-lapping. Sixth, the type of words found in the three samplings indicates adult rather than pupil situations, and point to lack of motivation.

Thus, it will be seen in conclusion that the Vocabulary Burden of the three texts studied is a really tremendous load for the pupil. In Junior High School Mathematics texts, it ought to be greatly lightened, or done away with entirely, if possible. *The question*

~~The question~~ raised at the beginning of this thesis is thus answered - so long as the already difficult





subject matter of Junior High School Mathematics is hampered and all but strangled with language difficulties - just so long will it remain almost overwhelmingly difficult, and the results of its teaching appallingly inefficient. The great need of the hour is for text books abreast of the best teaching methods, and adapted to the needs and interests of pupils and not of experts, that the pupils may really have a chance at success in Junior High School Mathematics.

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\* A star at the left of the book or article indicates that it was indispensable to this Study. The other references in the bibliography were used as background reading.



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