

METHODOLOGY

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*THE INDUCTIVE METHOD OF LEARNING HEBREW:
ITS ADVANTAGES AND ITS PITFALLS*

Almost a hundred years ago William Rainey Harper (1856-1906) began the publication of his works making use of the inductive method to teach Hebrew. His work *Introductory Hebrew Method and Manual* was first published in 1881. This work was revised by J. M. Powis Smith with the title, *Harper's Introductory Hebrew Method and Manual; New and Revised Edition*. Harper also published *Elements of Hebrew by an Inductive Method*, which was also revised by J. M. Powis Smith. Other works in this series were *Elements of Hebrew Syntax by an Inductive Method*, and *Hebrew Vocabularies*.

Collaborating with R. F. Weidner, Harper published an *Introductory New Testament Greek Method*, and collaborating with Isaac B. Burgess, he published *Elements of Latin*. At the request of Harper, and basing it on Harper's inductive method, Robert Dick Wilson published an *Introductory Syriac Method and Manual* and *Elements of Syriac Grammar by an Inductive Method*. Some copies of Harper's works announce the series of *Hebrew and Semitic [sic] Text-books*, including "Lyon's Assyrian Manual, Brown's Aramaic Method (Parts I and II) and Lansing's Arabic Manual." I have not seen any of these and do not know if they were ever published.

Harper was a genius, particularly in organizational ability. From 1891 until his death in 1906 he was president of the new University of Chicago and was responsible for much of its early reputation as one of the leading American institutions of higher learning. He was also professor of Semitic Languages and Literature, and it is reported that his classes in Hebrew numbered 200 students. He also established a correspondence course in Hebrew with elementary and advanced levels.

Harper also exerted considerable influence upon Wilbert Webster White (1863-1944), founder of what later become known as The Biblical Seminary in New York City. White attended Harper's Summer School of Hebrew at Morgan Park, Illinois, in 1883. During the following seven years, White and Harper were intimately associated. The validity of the inductive method greatly impressed White, and he extended it to the study of the Bible. One of his disciples was Howard T. Kuist who used the inductive method of Bible study in his classes at Princeton Theological Seminary. So the inductive method, whether in studying a language or the English Bible, is usually associated with the name of William Rainey Harper.

When I began to teach Hebrew twenty-five years ago, I had only heard of Wilbert White through students who had studied under Professor Kuist or who had attended Biblical Seminary. As for the name of William Rainey Harper, I associated it only with a very challenging commentary on Amos and Hosea in the *International Critical Commentary* series. The inductive method I had absorbed in college, where I majored in Chemistry. In my parish ministry I had applied a similar method to Bible study. I developed it further in courses in English Bible which I taught at Lafayette College. My use of the inductive method was apparent to others, and I was sometimes identified as a student of Professor Kuist — although I had never had the privilege of taking a course under him. I learned Hebrew by the classical method, using the McFadyen revision of Davidson's Grammar. During World War II, when I was stationed in China, I experimented in teaching Chinese by the inductive method, using a "native informer." Several of the men told me that I was using a method similar to that used by the Army Language School at Boulder, Colorado. During my doctoral studies at Dropsie University under Cyrus Gordon I learned a number of languages by the inductive method — but as yet I did not know it was the inductive method. It was only after I had spent a couple of years teaching Hebrew and Bible courses at Fuller Seminary that I learned that I was "using the inductive method," or more precisely, "using Harper's method." I began to read up on William Rainey Harper and I managed to obtain some of his works in Hebrew and Greek. It was obvious that there were similarities between his method and mine.

Since 1949 I have taught Hebrew and several other Semitic languages using my development of the inductive method. Since 1963 I have taught Greek by the same method. Approximately 2,000 students have taken my course in Hebrew, approximately 1,000 have taken the course in Greek, and perhaps 200 have taken the other language courses. The figures, of course, duplicate students who took two or more languages. A fairly substantial number of my students have gone on for graduate study, and I get reports on their linguistic abilities from their professors. In a few instances, my students have been given responsibilities in teaching language while they were engaged in the doctoral program at other universities. I have no hesitation in saying that the method works, and it works well. But I did not come here to boast about achievements of the method. Rather, I came to answer some criticisms of the method, to point out some of its advantages, and to discuss some of the pitfalls into which a student — or a teacher — can easily fall.

The criticism is often expressed in a simple question: If the inductive method is so good, why did Harper's method fall into disuse? Why have teachers gone back to Davidson or to other grammars that are based on the classical method? There are two parts to the answer. For one thing, the Harper method was made in America. I trust that such a statement will not be branded as chauvinism. It is a fact, which most of us have repeatedly found to be true, that American novelties in the field of education face stiff opposition, both here and abroad. What could the University of

Chicago offer, when it was only a few years old, compared to the great learning that has come from the British and European universities? Now, the argument may never have been expressed in such terms. But certainly the conflict between the novel and the established was felt. And speaking as a conservative, I find myself more often on the side of that which is established than on the side of the novel.

But I hasten to point out that the inductive method of learning a language is not novel. Indeed, it is the oldest method in the world. Every child learns his mother-tongue inductively. It is only when he has progressed well into primary or secondary school that grammarians attempt to impose a grammatical scheme upon him. Sometimes this gets him so confused that he finds great difficulty in writing, for he is inhibited by grammatical rules. Sometimes he makes a ready transition from the indigenous to the synthetic use of the language. More often, I believe, he manages to learn little or no grammar — until he runs into a course in a foreign language! It is possible to learn a language and to learn it well, without ever using a grammar, by simply listening to others use it or reading what others have written, while constantly making self-corrections and improvements.

A second criticism of the inductive method can be expressed in the statement, "You never really learn the language well." I admit that this is often true. The reason is to be found in what we shall discuss below. Students who have never had the method explained, or who sat under teachers who do not fully understand what is required of both teacher and student, or who themselves lack confidence in the inductive method, may indeed complete a course without learning the language well.

I suppose I should define what I mean by the inductive method. My students begin with a text in the language which we plan to study. In Hebrew we begin with *Megilat Esther*. They learn the alphabet as they encounter it. After we have covered a few sentences, we go back and learn vowel-points, accents, punctuation, etc. At the same time the student is introduced to plural endings, construct forms, prepositional prefixes and the like. We deliberately skip over verb forms for the first ten or twelve lessons (in a course of 80 lessons), and concentrate on nouns, adjectives, phonetic changes, morphological elements and the like. We introduce elements of syntax at about the fourth lesson, and at the same time we start learning basic vocabulary at the rate of ten new words per lesson (with a goal of learning about 700 basic words).

There is orderly progress in the discussion of elements of the language. I impose this on the text — but I do not disregard the text. In other words, we learn the H-stem (*Hiphil*) in passages where it occurs with greater frequency, the infinitive construct in passages where it is frequent and so on. The student is not introduced to everything at once; rather he is introduced to a selection of the materials that can be found in any portion of the text. I build repetition into the course, calling the student's attention to any given point of the language at least five times in successive lessons, then after an interval we return to this point several more times. When the

student has read enough of the language, he will have encountered all of the elements that he needs for normal reading.

A minimum of twelve to fifteen chapters of narrative text is required, in my opinion, for the first course in Hebrew. For Greek, which has a more complex morphological and syntactical structure, at least fifteen chapters, preferably twenty, is required. These figures are not arbitrary. There is a ratio between the number of sentences (or pages) read and the number of new elements introduced. I can illustrate this best from vocabulary, and particularly from the vocabulary of the Greek New Testament where statistical tables are available.

There are approximately 209 words on an average page in the Nestle Greek New Testament. Some of these words are quite common, and will occur several times on any page. Other words are quite unusual, and will occur infrequently. (See TABLE A.) Forms of the word *autos*, for example, occur 5,534 times, or approximately eight times per page. The word *hina*, on the other hand, occurs 673 times, or approximately once per page. A student, by reading a single page of the New Testament in Greek, would have enough experience of the word *autos* to learn its meaning, but he would have to read at least four pages to have sufficient encounter with *hina*.

However — and this is an extremely important fact — the rate of encountering new words will not be a straight line. There are 81 words in the Greek New Testament that occur 200 times or more, or about once in three pages. If we assume that these appear at this rate, the student will have encountered all of them after reading only three pages. Thereafter these words are not new. Likewise, there are 90 words that occur 100 to 199 times, or an average of once in five or six pages. After reading six pages the student should have encountered all or most of these words, and thereafter they are not new. If we chart this progression on a graph, we shall see that it can be represented by a line that falls with increasing rapidity as the student reads more pages. (See Table C.) In other words, he will encounter fewer new words in the second dozen pages than he encountered in the first dozen pages.

We must add to these data another group of data. There are a number of words that occur with low frequency in the Greek New Testament. There are 1,934 words that occur only once — an average of about three of these hapax legomena per page. There are 4,302 words that occur from once to nine times each. On an average 17 of these words should occur on any page of the New Testament (disregarding random distribution). (See TABLE D.)

The same pattern will be true of elements of phonology, morphology and syntax — although I have no statistical tables on these subjects. Some of these elements will occur with high frequency, such as the assimilation of *n* to an immediately following consonant, the masculine plural construct ending or the use of a preposition with an infinitive construct. Others will occur very rarely. The student will probably encounter most of the more common phenomena in his first few pages of reading. The

less common will require many more pages of reading. And we must keep in mind the fact that learning involves repetition. The student must encounter a linguistic phenomenon — knowingly — several times before he learns it.

It has been my experience, in examining other inductive grammars, that many of them simply do not include enough textual material. Harper, for example, covered only eight chapters of Genesis. He lists 429 words in the vocabulary of Genesis 1-8. Unfortunately, he does not give the word-count of all these words, nor the number of proper names that occur only in this portion of the Old Testament. Of the words whose frequency he notes, 39 occur less than ten times, and 49 have a frequency of ten to twenty-four times. Not more than 341 words (and certainly considerably less than this figure) have a frequency of 25 times or more. This is not a sufficient vocabulary for first-year study.

In Table A, I have given the count of new words (except names) encountered in the first 32 pages of the Greek text of Acts. There are 588 high-frequency words and 368 low-frequency words that are encountered for the first time in this portion of Acts. Since I have not carried my statistics further, I have added Dr. Winter's projection, based on statistical formulae, adapting it and adding the increments (his table has only the totals). (See Table B.) But word-counts do not really give us the data that we need. It is the average of new words that a student can expect to encounter that gives us an indication of how many pages he should read. In Table C, I have given these averages, based on my count (Table A), and in Table D, I have given the averages based on Dr. Winter's projections (Table B).

Based on these data, it seems to me that the student in first-year Greek should read at least 32 pages if he is seeking to learn the words of frequency of 25 times or more, and between 32 and 64 pages if he wants to include the words of 10 times or more. Beyond 64 pages, he will be encountering mostly new low-frequency words.

Once again, using this as a basis for projecting the study of phonology, morphology and syntax, I would conclude that at least 32 pages in Greek is the minimum and 48 pages is preferable. Using the 1 : 1.6 ratio mentioned above, this would convert to about 19 to 29 pages in Kittel. I might point out that these figures (except for irregularities introduced by random occurrence, grouping of words, etc.) will obtain whether the student reads successive pages or reads selections drawn from different parts of the Bible.

What are the advantages of the inductive method?

First, the student finds immediate pleasure (a relative term, I grant) in learning the language. Following the classical method, the student spends most of the first year learning paradigms, phonetic rules, some syntax, and lots of unrelated vocabulary — without ever encountering a text in the language. Of course, he is expected to translate sentences, both from Hebrew to English and from English to Hebrew (even if his mother-tongue is Japanese or Spanish!). This is usually quite artificial; the sentences are constructed to fit the lesson, and sometimes even border on the ridiculous.

I found this gem in a grammar: "My uncle's male camel loves my aunt's female camel."

Using the inductive approach, the student is immediately using the language in an authentic text. He has Esther (or Acts, or Daniel, or Hammurabi) in his hand. He is given a literal translation from the start, even though he will not be required to translate for many lessons, for this both satisfies his curiosity and teaches him that he is not dealing with a nonsense text. Moreover, he can learn syntax in the thought-form of the new language even from the literal translation. Students have often told me, "I am really enjoying this way of learning Hebrew (or Greek, etc.)."

Second, the student learns to recognize the significant morphemes, rather than being forced to "go to the paradigm." In any language there are certain morphological elements that the indigenous speaker or reader listens or looks for. Communication would grind to a halt if everyone had to "go to the paradigm." In Hebrew the student learns to note the difference between *yiktob* and *tiktob*, between *yiktohu* and *yiktohu*, between *tiktob* and *katobta*, etc. As soon as possible he learns to transfer the morpheme into its approximate equivalent in his own language.

The constant encountering of new morphemes (as well as new vocabulary) in the first few weeks of the course leads to much confusion, and the student may become discouraged. I have found that between the tenth and the twentieth or thirtieth lesson (in a course of eighty lessons) the student needs every possible encouragement from the teacher. He needs constantly to be told that about lesson 30 he will have *encountered* just about all of the words and forms and syntax that he can expect to meet in normal reading. Obviously he has not *learned* all of these bits of data, but he has met them. The balance of the course — the remaining 50 or 60 lessons — will be largely repetition.

The course should be so structured that the repetition is meaningful to the student. Purposeless repetition does not accomplish learning. It is helpful to refer the student back to the same or similar forms and expressions that he has already encountered. It is especially helpful if some slight but significant difference can be pointed out in several different occurrences. Make use of the "building block" method of learning. Remember that the student is not reading 10 or 15 chapters of Hebrew just as an exercise — rather, he is reading in order to encounter new data and to repeat and learn data already encountered.

Third, the student is only required to learn what he encounters. When I was a first-year student in Greek I was forced to learn the paradigms. When I was putting together the material for my *Handbook of New Testament Greek*, I attempted to find actual forms to replace the numerous hypothetical forms in the grammars. It was then that I discovered that I had been forced to learn whole segments of paradigms illustrating forms that simply do not occur in the entire New Testament. The next time you pick up *Genenius' Hebrew Grammar*, turn to the paradigms and note the number of hypothetical forms (those marked with asterisks). What kind of education is this? In a day when there is just too much for any mere

mortal to learn we cannot afford the luxury of requiring a student to learn useless material.

At the same time, the student learns best what he encounters most. Again let me turn to data from Greek. In Table E, I have compared word-frequency with word-volume. The high-frequency words (more than 10 times) account for only about 21% of the vocabulary. Yet they occupy nearly 92% of the volume of the New Testament. On any given page, even though these are not new words, the student will meet nine high-frequency words in every ten words he reads. The same is true of high-frequency elements of morphology and syntax. These are the things the student needs to know.

When I was a student in elementary Greek we were told: "Syntax is the most important part of learning Greek. Unfortunately, we won't have much time at the end of the course to study it." In Hebrew we never did get around to studying syntax. *But there is no phrase, no prepositional expression, no construct state that does not involve a point of syntax.* These high-frequency items abound on every page of the Bible. If the student is made syntax-conscious right from the start, he will learn syntax as he encounters it — if not the first time, certainly after he has had repeated experience with that point of syntax and if his teacher has taught him to look for such data.

The greatest advantage of the inductive method, in my opinion, is this: the student, by being taught to observe and to relate what he observes with previous observations, is learning how to learn. By the time he has finished a well-constructed and well-taught course using the inductive method, he is ready to set out on a life-time of learning through self-teaching.

During the twenty-five years I have been teaching languages I have had probably 50 student assistants. My assistants do not simply mark papers and do the dirty work. They actually teach. In some cases they have been totally responsible for the entire course. I have been able to put this confidence in them because they have learned how to teach themselves. At first they come to me with questions that they cannot answer. I generally lead them to work out the answers from observation by posing a few well-designed questions and turning to some of the text. Before long they learn to ask themselves such questions, and then they are on their own. They enjoy learning, and this enthusiasm rubs off on their students. Since they are all trained to use the inductive method, errors they make will eventually be corrected as they encounter the same phenomena in the text they are reading.

What are the pitfalls to be avoided in the inductive method?

The greatest pitfall, in my opinion, is the lack of preparation by the teacher. Now, this is not intended as an escape-hatch on my part. I am not laying a foundation so I can say to you, "If you can't make the inductive method work, it's because you don't know how to teach it." Rather, I am making a confession from my own experience. It is possible for me to open the Bible at random to any narrative portion and to teach inductively from that portion without previous preparation. I do this sometimes for

review, and I use this with my teaching assistants to show them that it can be done. There is sufficient material on any page to review just about anything that needs to be reviewed. But when I have said that, I must counter it with another statement: anytime I attempt to teach a lesson without previous preparation, I can be sure I will do an inferior job. I recognize it, and the better students, who have prepared the lesson, can recognize it.

When I taught Greek by the classical method, it was possible for me to go to class knowing that today the student is studying the aorist active participle. He will not ask anything that is not connected with the aorist active participle. He has been memorizing the paradigm. He has been translating sentences that include it. Therefore, I need only to be able to answer questions on this subject. A quick review, and I am ready for class.

But when I teach by the inductive method, practically any subject in the book can be brought up by a student. He is observing, and asking questions based on his observations. Perhaps for the first time he has really noticed the lack of a *sigma* in a first aorist form of a "liquid" verb. I have to be ready for that question — and for many others. In my early days I tried bluffing. But that didn't work. Observant students soon knew that the bluff did not have inductive data to support it.

I learned that two things were necessary to teach inductively: first, complete familiarity with the text assigned for the day, so I would not be surprised by any question that might come up; and second, complete honesty with the students. If I didn't see the answer to a question, I would admit it, work on it in my office or at home, and present the answer along with the evidence at the next class session. Occasionally, I would have to admit that I had no answer to a question. At first, this kind of honesty is humiliating, but after a while it becomes in itself a learning experience and a teaching point. The student comes to realize that not all questions are answered, not all knowledge is encapsulated and there is still much to be learned.

One of my greatest joys was to see a student's question lead to research on his part, followed by the publication of his results in an international journal of specialized scholarship. The editor told me that he had dropped three scheduled articles by recognized scholars to publish my student's article. All I had done was to tell the young man what to look for and where it might be found. He did the rest, recording his observations, integrating them, and drawing conclusions from them.

The second pitfall is failure to synthesize the inductive data. This leads to the criticism, "The student reads, but he never learns." Too often this is true. Scientific research is built on the inductive method, but if scientists never synthesized their observations, there would be little if any scientific advance. The student of language must learn the same truth. Mere reading of texts is not learning!

The classical method gives the student the synthesis that has already been done. The student does not see the synthesizing process; he merely memorizes the results. The inductive method gives the student the data — vast amounts of data. But if he does not attempt to synthesize these data he has learned little of the language.

In my courses I encourage the students to construct paradigms from the forms they encounter — not to be memorized, but to be studied for significant features. Likewise, I stress comparison of similar passages, particularly where there is some observable, significant difference. The synthesizing of these comparable and contrasting data teaches the student significant points of phonology (sometimes), morphology (usually) and syntax (always).

Ideally, each student should write his own grammar from the synthesis of his observations. This is neither practical nor feasible. But in his mind he is constructing a grammar. He is arranging bits of data in his brain so he can recall what he needs when he needs it. If this is done faithfully by each student (and encouraged and supervised by the teacher), this pitfall can be avoided.

Another pitfall, similar to the previous one, is the lack of a manageable and adequate vocabulary. If the teacher requires the student to memorize every new word as it occurs, he is imposing an impossible and valueless task on the student. Again, I must turn to the Greek New Testament for data. From Table E we can see that 92% of the words the student will encounter are the words that occur 10 times or more — and this amounts to only 1,134 words, or about 21% of the words in the New Testament lexicon. These are the words he should learn. There are 4,302 words in the lexicon that occur 9 times or less — approximately 79% of the vocabulary. But the student will encounter these words only about 8% of the time. Except for the few words of great theological significance in this category, he is really spinning his wheels to learn these words. The words that are theologically significant can be saved for exegesis courses after he has completed the first-year course.

In the light of such facts, I require the student to learn only a basic vocabulary, in other words, those nouns, verbs, and particles that appear on the high-frequency list. Moreover, these words are not learned *in vacuo* but rather as they are encountered in the text. This takes some advance planning, but the student is never memorizing words only to forget them through non-use. If the student in Hebrew learns the words with a frequency of 25 times or more during the first year, the total of 991 words will be quite heavy. But if these words are learned along with associations according to the roots, it should be manageable. And if he adds the words that occur 10 times or more during the second year, he will have a vocabulary of around 1,700 words. While I do not have figures available for Hebrew such as those given in Table E for Greek, I have no hesitation in predicting that a similar situation obtains. These 1,700 basic words will form 85% to 99% of the words (by volume, not by lexical count) the student will encounter in the Hebrew Bible.

A fourth pitfall, which in my opinion is not really a pitfall, is suggested by the criticism that the student does not have an "active" control of the language. He cannot write sentences in Hebrew.

Personally, I do not want him to write sentences in Hebrew until he is at least familiar with good, written biblical Hebrew. Writing sentences prior to that time simply impresses mistakes on the student's mind.

Let's be frank. How many of us can write sentences in pure biblical Hebrew? When I was working for my Ph.D. — at Dropsie University, I might add, where most of the faculty and many of the students had been familiar with the Hebrew Bible from childhood — I took a course in which we were required to write sentences in Hebrew. The professor would give us a number of English sentences. I would carefully look up anything similar in the concordance, study the biblical parallel and write my sentences, copying the biblical style as much as possible. My sentences never satisfied the professor, neither did anyone else's in the class. What is "good biblical Hebrew"? Twenty-five years and thousands of hours of study later, I am still not prepared to say just how a sentence should be translated into biblical Hebrew. Perhaps that is why a "crib" is available with certain grammars, so the teachers will know what the "right" answer is for the sentence translations!

From where I sit, it seems that the time spent on translating sentences from dubious English to questionable Hebrew might better be spent in additional reading of Hebrew texts which are written, we all agree, in good Hebrew.

What shall I say in conclusion? I might quote a famous television actor and say, "Try it; you'll like it!" But I am not certain that would be true in every case. The inductive method is not the only method of learning a language. I have learned several languages, including some I now teach inductively, by the classical method. So instead I shall simply quote one of my former students, who later produced a Hurrian grammar for his doctoral dissertation: "If I had not been trained in the inductive method," he told me, "I could never have produced that Hurrian grammar. There were no other Hurrian grammars to work from."

Inductive study develops independent scholars, whether it be the student taking the course or the teacher guiding the student. For this reason, if for no other, the inductive method deserved careful consideration. [TABLES A, B, C, D, and E are on the following pages.]

TABLE A. NEW WORDS ENCOUNTERED IN ACTS

(Figures from count in Nestle's text by William Sanford LaSor)

Pages	New words	Words of 25x +	Words of 10-24x	Words of 5-9x	Words of 1-4x
1 p.	77 = 77	66 = 66	6 = 6	2 = 2	3 = 3
2 pp.	69 = 146	47 = 113	12 = 18	3 = 5	7 = 10
4 pp.	83 = 229	42 = 155	9 = 27	5 = 10	27 = 37
8 pp.	165 = 394	78 = 233	37 = 64	15 = 25	35 = 72
16 pp.	214 = 608	81 = 314	45 = 109	29 = 54	59 = 131
32 pp.	349 = 957	96 = 410	70 = 179	62 = 116	121 = 252
Total words in NT	5,436	553	581	734	3,568

Note: 32 pp. = Acts 1:1-10:19.

*Totals taken from Morgenstaler.

TABLE B. PROJECTION OF NEW WORDS TO BE ENCOUNTERED

(This projection was made from statistical formulae developed by Ralph D. Winter)

Pages	New words	Words of 25x +	Words of 10-24x	Words of 5-9x	Words of 1-4x
1 p.	118= 118	91= 91	12= 12	6= 6	9= 9
2 pp.	77= 195	48=139	12= 24	8= 14	9= 18
4 pp.	120= 315	68=207	23= 47	13= 27	16= 34
8 pp.	193= 508	90=297	43= 90	26= 53	34= 68
16 pp.	284= 792	94=391	74=164	50=103	66= 134
32 pp.	406=1,198	74=465	114=278	88=191	130= 264
64 pp.	561=1,759	38=503	134=412	142=333	247= 511
128 pp.	733=2,492	8=511	100=512	181=514	444= 985
1/2 NT	1,268=3,760	0=511	29=541	163=677	1,076=2,051
3/4 NT	625=4,384	0=511	0=541	9=684	616=2,647
*all NT	469=4,854	0=511	0=541	0=684	469=3,116

Note that each line (except 3/4 NT) doubles the preceding number of pages. Only in the 1-4x words does this increment hold steady; the 5-9x words hold steady for about 16 pp., the 10-24x for about 8 pp., the 25x + words fall off from the beginning.

*These figures exclude proper names (570 according to Morgenthaler), and in addition were taken from a different source.

TABLE C. AVERAGE NUMBER OF NEW WORDS PER PAGE BY COUNT

(This table is drawn from the figures in Table A.)

	Words New Ave.	Words of 25x + New Ave.	Words of 10-24x New Ave.	Words of 5-9x New Ave.	Words of 1-4x New Ave.
1st page	77	66	6	2	3
2d page	69	47	12	3	7
3d-4th pages	83	41.5	42	21.0	9
5th-8th pp.	165	41.2	78	19.5	37
9th-16th pp.	214	26.7	81	10.1	45
17th-32d pp.	349	21.8	96	6.0	70

Note: The first page, being the beginning of Acts, is 8 lines (nearly one-third) shorter than the following pages. If we extrapolated, this would bring my figures and Winter's into closer agreement for the page. However, the discrepancies on other groups of pages would not be affected.

TABLE D. AVERAGE NUMBER OF NEW WORDS PER PAGE BY FORMULA

(This table is drawn from the figures in Table B.)

	Words New Ave.	Words of 25x + New Ave.	Words of 10-24x New Ave.	Words of 5-9x New Ave.	Words of 1-4x New Ave.
1st page	118	91	12	6	9
2d page	77	48	12	8	9
3d-4th pp.	120	60.0	23	11.5	16
5th-8th pp.	193	48.2	43	10.7	26
9th-16th pp.	284	35.5	94	11.7	34
17th-32d pp.	406	25.4	74	7.1	50
33d-64th pp.	561	17.5	38	1.2	88
65th-128th pp.	733	11.5	8	0.1	142

Note that up to the 16th page, the student is meeting more high-frequency words (10-24x and 25x +) than low-frequency. From that point on, however, he encounters more new low-frequency words than he does new high-frequency words. After 32 pages he has little opportunity to encounter new high-frequency words.

TABLE E. COMPARISON OF WORD-FREQUENCY AND WORD-VOLUME IN THE NEW TESTAMENT

Frequency	Number of words in NT vocabulary	Volume of words in NT
more than 100x	171 = 3.15%	98,996 = 72.08%
25-99x	382 = 7.02%	18,593 = 13.54%
10-24x	581 = 10.69%	8,586 = 6.25%
5-9x	734 = 13.50%	4,847 = 3.53%
1-4x	3,568 = 65.60%	6,316 = 4.60%
Totals	5,436 = 100.00%	*137,338 = 100.00%
more than 25x	533 = 10.17%	117,589 = 85.62%
more than 10x	1,134 = 20.86%	126,175 = 91.87%
9x or less	4,302 = 79.14%	11,163 = 8.13%

*Morgenthaler gives the total at 137,328. My total is derived from Morgenthaler's figures for each frequency, and although a graduate assistant and I checked the figures several times we could not locate the source of the discrepancy. I might also add that although Morgenthaler gives the total number of words at 5,436, he lists 5,438 words in alphabetical order. Such is the lot of a statistician!

Note that the high-frequency words (10x or more) account for only about 21% of the vocabulary, but these words occur almost 92% of the time. The low-frequency words, on the other hand, account for 79% of the vocabulary, but they occur only 8% of the time.

NOTE: Footnotes have been omitted in Professor LaSor's paper. Readers interested in the references may turn to the author.