

T H E S I S

on

A STUDY OF THE PSYCHOLOGICAL LAWS USED  
IN THE  
ANALYTICAL METHOD OF TEACHING GREGG SHORTHAND

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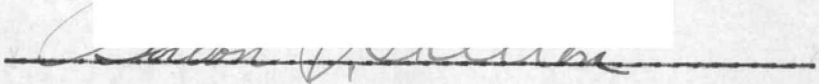
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A STUDY OF THE PSYCHOLOGICAL LAWS USED  
IN THE  
ANALYTICAL METHOD OF TEACHING GREGG SHORTHAND

We do not know the way in which any special school subject is actually learned or the way that any specific skill is acquired because we have no even fairly complete psychological history or fine analysis of the learning process by which they are acquired. This study does not purport to tell the manner in which shorthand is learned, but only to show that "The Analytical Method of Teaching Gregg Shorthand" (19), presents the subject in accordance with the known and accepted laws of learning.

As early as the fourth century B.C. many different systems of writing had been worked out which had for their purpose the recording of spoken words in a system of symbols more concise than the then existing forms of writing. Records show that the Greeks and Romans had systems of pseudo-shorthand or of abbreviated symbols although some of these were little different from longhand except that they could be written more compactly. The process of writing these symbols was slow and laborious, as it was done with a stylus on a wax tablet. A study of the records of these writings indicates that, when a symbol was not forthcoming to express an unusual word, such as a proper name, it was customary to express it by a group of syllabic signs which were quite as complicated as

longhand, or even more difficult to write and to translate.

The shorthand used during the time of Cicero was a system in which each word was represented by a character, alphabetic in origin, but having an ideographic value. M. Tullius Tiro, a freedman of Cicero's, is accredited with the system which was used quite extensively in southern Europe during the Roman period. It was adapted by various writers to the various languages and dialects of the time, thus giving rise to variations in different countries. The Tironian system, as it was called, improved upon earlier Roman methods by introducing a syllabic system, not only for the usual vocabularies but to take care of proper names and comparatively rare words as well (13). Some idea of its utility can be gained from a statement written by Cicero to a friend, in which he said that it was possible to dictate in "periods" to Tiro but only in "syllables" to Spintharus, another of his secretaries. It is quite probable that Cicero meant phrases or sentences by the word "period." The shorthand of that time does not compare with modern shorthand as far as speed is concerned. In reporting the proceedings of the Roman Senate about forty shorthand writers were present, each recording as much as he could. Later the writers assembled and attempted to make up a connected report from the combined

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notes of the group (24 p. 126).

The Tironian system was used quite extensively during the ninth and the early part of the tenth centuries and is found in many of the royal deeds and literary works of that period. During the Medieval Period or the Dark Ages interest in shorthand decreased until its complete disappearance about the eleventh century. Not until the sixteenth century, when shorthand was revived in England, did it again come into extensive use. The Reformation created a desire for the preservation of the exact words of the religious leaders of the day. Moreover, a need for a quicker system of writing was felt because of the quicker tempo of renewed emphasis on the value of life in this world. In the primitive systems developed during the earlier part of this period, many brief, arbitrary signs were devised to denote phrases, especially those common in the New Testament and in Protestant theology.

Timothy Bright was one of these early inventors. He makes the following statement regarding his system, "Upon consideration of the great use of such a kind of writing (Tironian Shorthand), I have invented the like; a few characters, short and easy, every character answering a word." (24, p. 276). On July 26, 1588, Queen Elizabeth granted Mr. Bright a patent for a "shorte and new kynde of writing by character to the furtherance of good learning."

(24, p. 177). Peter Bales, originator of another of these early systems, made the statement that "you may also learn to write as fast as a man speaketh, by the art of Bracheography by me devised, writing but one letter for a word," (13, p. 109) but one could acquire a practical knowledge of the Bales' method only when he had a gigantic memory and had performed unremitting labor. This system and its contemporaries were not flexible. Each character had one meaning and no other. The system depended entirely on rote memory.

John Willis was really the "father of alphabetic shorthand." In 1627, he developed a system which was based on the longhand alphabet, but the clumsiness of his symbols and the laborious contrivances for the expression of prefixes and suffixes, resulted in a writing almost as slow as longhand. Mr. Willis' book, "The Art of Stenographie" contains the following statement, "It is to be observed that this art prescribeth the writing of words, not according to the orthography as they are written, (in longhand) but according to their sound as they are pronounced." (24, p. 224). During the two centuries which intervened between the appearance of this system and that of Isaac Pitman (1827), many different systems came into being. The majority of these, like Willis', were based on the alphabet although a few resembled Pitman's system in



that they were strictly phonetic. The principal difficulty with these systems was the complicated forms of the characters devised.

In 1827, Isaac Pitman developed a system which received an enthusiastic reception and which is one of the prominent shorthand systems of today. A difficulty in the use of this system is that too great attention to, and care in line-position and shading are necessary. This reduces the speed of writing and often causes extensive confusion in the learner.

Gregg Shorthand really had its inception in a church one Sunday morning when Mr. John Robert Gregg was just a boy. His father had a friend who was a writer of shorthand and who kept many personal notes in this way. One Sunday he attended church with the Gregg family and made some rapid notations as the sermon progressed. Mr. Gregg's father was so impressed with the incident that he decided to have all of his children learn shorthand. Accordingly, Mr. Gregg mastered the Taylor system which had been published about fifty years before Pitman's work. It was based on phonetics, was written along the line of writing, and was very fluent. Later he studied Pitman and saw its weaknesses in position and shading. Young Gregg was not satisfied with the knowledge of the two systems which he

soon learned, (Taylor and Pitman) but studied nearly all the systems in use at the time. He found that all seemed to have good points, but likewise all had rather pronounced defects. He adopted what he considered the good points from these various systems and started to work out a system of his own. Some of the points he favored in these various systems were:

<u>System</u>	<u>Commendable feature</u>
Pitman	Based on phonetics
Taylor	Brevity of form and fluency
Duploye	Vowel insertion
German systems	Longhand natural slope

Mr. Gregg began the formulation of his system by giving a value to the shorthand characters he intended to use. He then analyzed the language to discover the most frequent sounds and combinations. He believed the earlier systems had failed because they did not give sufficient attention to the best use of combinations that were natural to the hand. "Pl" and "pr" are examples of the outcome of this analysis.

The technique of the Gregg Method was published first in 1888 in England. In 1893, Mr. Gregg came to this country from England and introduced his system in Boston. Since 1900 it has spread rapidly throughout the country and is today the most widely used system of shorthand. The superiority of the method lies principally in:

- (a) use of the same strokes employed in longhand writing
- (b) writing the symbols with a free and easy writing movement
- (c) no shading or position above or below the line of writing necessary.

The next major development in the field of shorthand was the publishing of the "Analytical Lessons in Gregg Shorthand," by Mrs. Minnie D. Frick, in 1924. When Mrs. Frick first began her study of Gregg Shorthand she found that it was much easier to learn the various symbols for words containing the same sounds by arranging them in groups. The Gregg shorthand system proved itself to be readily adaptable to this new plan. After some months of study, Mrs. Frick concluded that other students would probably find mastery of the Gregg system easier and quicker if it were presented by this, then only partially conceived "grouping method."

After completing a course in shorthand, Mrs. Frick was surprised to discover, while reading an editorial that her knowledge of shorthand word analysis did not coincide with the vocabulary of such articles. There were many words for which she had seen no shorthand outlines. These words had not been in the exercises of the shorthand text--with the result that Mrs. Frick and other students of shorthand did not have symbols for them in their shorthand vocabularies. Her belief that the pre-

sensation of shorthand could be improved grew stronger as she realized that pupils were taught to respond to visual stimuli found in a text instead of auditory stimuli from a speaker's voice.

Mr. Gregg revised his system and presentation of shorthand and published a new manual in 1929. This is known as the "Aniversary Edition of the Gregg Shorthand Manual." This revised edition embodies numerous improvements including the presentation of "tet, ted, men, mem" and other blends earlier in the course. The letter "s" which was formerly in Lesson V is now with the other downward characters in Chap. II. These, and other changes, were the result of studying difficulties experienced by beginning students and advanced writers over a period of years. Through an extensive study of errors in transcription, it was found that some of the shorthand characters were too brief. It was found also that some of the disjoined prefixes were not used frequently enough to make their learning economical.

The appearance of the new Gregg Manual with its changes in shorthand outlines, and many requests for a more complete explanation of her method of teaching, stimulated Mrs. Frick, in 1931, to bring out a new book called "Teaching Gregg Shorthand by the Analytical Method." Some of the changes and improvements found in "Teaching Gregg



Shorthand by the Analytical Method" are:

- (a) A thorough explanation of the "Analytical Method" in Part I. It is designed to serve as a text in teacher-training classes and as a guide to the class-room teacher in the presentation of shorthand.
- (b) Arrangement of material in daily lesson plans in Parts II and III. The arrangement correlates in period, unit, and paragraph with the Manual and other Gregg publications.
- (c) A thoroughly worked-out application of the prominent laws of educational psychology to the Gregg system of shorthand.

This "Analytical Method" of learning Gregg shorthand is designed to reduce rote memory to a minimum, to develop as fully and quickly as possible an automatic shorthand response to sound groups and, ultimately, to enable the student to write both familiar and unfamiliar words with ease and facility. The psychological order of the mastery of shorthand follows that of any form of mental learning--stimulus, perception, analysis and synthesis by further association, and response. In terms of the learning of shorthand these steps are: hearing the sound syllables, analysis of the steps in learning the symbolic responses, writing the outlines, and checking by fleeting translation at the moment of writing. These are followed by the more formal and crucial check on the writing through translation and transcription.

STEPS EMPLOYED IN THE ACQUISITION OF SHORTHAND  
SKILL THROUGH THE ANALYTICAL METHOD

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Hearing The Sound Syllables.

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The phonetic method of teaching and of learning shorthand is a practical one because the individual must "possess phonetic recognition power before he becomes independent in recognizing new words.....We recognize new words through life by the phonic method only. Therefore, the process that leads to independent automatic recognition power most quickly, and most definitely, is the best." (27, p. 65).

The court reporter or experienced stenographer responds to the dictator's voice with shorthand outlines so rapidly that the action appears to be almost automatic. He has acquired this speed through the perfection of several important and rather distinct habits. The first of these is the auditory response to sound. The beginning learner of shorthand has been hearing sounds (words) for years and has learned to make responses of various sorts to these sounds, but his shorthand problem is the learning of a new form of response to this sound stimulation.

The importance of hearing the sound accurately and in an analytical frame of mind and of developing

speed, accuracy, and self-confidence in the consequent association cannot be over-emphasized in the learning of any system of shorthand, since the sound is the stimulus for the shorthand response. Gregg shorthand is based on phonetics, that is, each sound has a response in the form of a shorthand symbol. The writer must hear the sound and associate it immediately and accurately with a certain definite shorthand symbol. This is particularly true in the Frick "Analytical Method" because the whole system is based upon the matching of single sounds and of sound-groups with shorthand outlines. In the first learning of the word "hat," for instance, each letter is sounded and a shorthand symbol written for each. The writer then joins the symbols in the following manner: "h" ( . ), "a" ( o ), "t" ( - ), "hat" ( √ ). Another example, illustrating the response to sound, is the word "sign." Three letters only are pronounced and they are written, "s" ( ∨ ), "i" ( o ), "n" ( - ), "sign" ( ∞ ).

Mrs. Frick calls a shorthand response to an alphabetic sound a "picture." She refers to the alphabet as the "letter names" and compares sounds with individuals, explaining that the alphabetic name "k" is similar to the individual's name "John Smith" and the shorthand symbol ( ∩ ) is similar to the photograph of Mr. Smith. The students are thus impressed with the fact that they are not

learning a new manner of expressing the longhand alphabet, but are learning a new manner of expressing sounds.



Some students have not been faced with the necessity of making careful distinctions between sounds. Special training is necessary before they appreciate the finer sound variations. The importance of careful discrimination between sounds can be seen readily when we consider such words as "resolve" and "resold." In ordinary dictation these words might sound so much alike that the incorrect word would be written with a subsequent incoherence in meaning. The ability to make fine distinctions is not innate, but is a result of the learning process, and can be developed only through purposeful practice.

It must not be forgotten that the sounds of the letters of a word pronounced independently do not make the word any more than the names of the letters make the word. Teaching the blend of the consonant and the vowel is, therefore, an essential feature of this method. It is highly important that the student not only hear the sound of each letter or digraph, but that he know that certain sounds unite to form sound groups and that each of these, psychologically, is expressed by its own "pattern form."

The instructor dictates "k" and the students write the proper symbol until they are able to respond with the pattern whenever the sound stimulus is heard. Overlearning



which may be defined as learning well beyond the mere ability to recognize the patterns in connection with the sounds of the basic symbols, is necessary in order that the response may be adapted quickly in symbols of increasing complexity. These overlearned basic patterns are constantly combined into new responses to express new and larger sound-groups.

In order to help the class understand sounds and blends more readily they are asked to do some work on them audibly. Comparison of the different sounds and the manner of forming them is given attention. For example, in the presentation of the "nt" (  ) "mt" (  ) blends, the sounds are made by the students and the instructor points out that "mt" is a longer sound than "nt" and therefore is expressed by a longer shorthand symbol. Thus the principle of self-activity is brought into play and the student is given another aid to memory --- vocal-motor imagery as well as auditory and kinaesthetic (muscular) imagery.

"The effort at uniting individual sounds into combinations to form words must at first be made slowly and consciously and will require the full primary attention, but it gradually becomes rapid and automatic." (27, p. 36).

Because of the importance of hearing the sound in learning shorthand by the "Analytical Method" the instructor who uses this method must enunciate clearly. If the

student is to respond to the sound stimulation of the dictator's voice it is essential that the correct stimulation be perceived before further accurate neural reaction is possible.

### Learning the Symbolic Response.

Before an individual can become a rapid writer of shorthand, he must know the symbols so thoroughly that, when the sound stimulus is presented, he will make the symbol response almost automatically.

"The effectiveness with which a new subject is presented to the student largely depends upon the degree of correlation which is secured between the unknown and the known--between new ideas and ideas long familiar. The arrangement of this book is such that the student is led step by step through the labyrinth of analysis, comparison, and synthesis, so that finally he will be able to write in shorthand any word in the English language simply by joining the smaller parts to form the whole.

"The further object of this book is to eliminate the heavy burden of memorizing designs, and to substitute therefor the interesting game of word-building. Shorthand word-building is constructive work rather than imitative. First the given word is divided into its parts; second, the parts are visualized in their shorthand duplicates;

third, the word is reconstructed into the written design." (18. foreword).

Shorthand symbols look very strange to persons who have not studied them. The beginner may have the impression that the symbols are drawn in some arbitrary and unrelated manner quite foreign to his previous experience. This and other erroneous impressions must be corrected by demonstrating that shorthand symbols are written in the same general manner as longhand.

In a memory method of presenting shorthand it is necessary to memorize a shorthand outline for every word which may be met in the vocabulary used by any dictator for whom the shorthand writer may have occasion to write. It can be seen readily that this is a long and laborious process and that few people could learn to write fluently under such a system. Moreover, it would be necessary for the learner to know exactly what type of work he was going to enter in order that he might learn outlines for the trade terms of that industry. If he had not memorized symbols and outlines for all of the terms, he would find himself in a predicament similar to that of the old Greek and Roman writers when they heard an unfamiliar word. The "Analytical Method" strives to eliminate this handicap through the analysis of words into sound-groups and the provision of shorthand responses that are similar for the whole group.

These sound-groups are known as "transfer units" because they are found in whole groups of words, or they may be considered as units which have been "transferred" from one word to other similar words. The "Analytical Method" teaches one shorthand response for each of these sound-groups or "units," regardless of the length or type of word in which it may be heard. To the shorthand writer who has learned by the "Analytical Method," a new word simply means a different combination of "pattern forms" or "transferable units." The writer listens carefully to the pronunciation of the word, analyzes it into familiar parts, and is able to write it almost as quickly as a word which he hears daily.

"Things that are actually associated as contrasting with each other have something in common; and, therefore, association by contrast could be included under association by similarity." (55, p. 395). "It is safe to say that without association, memory and recall would be impossible." (22, p. 362).

Alternations of sound stimuli help the student to discriminate among them and make the proper responses to each. "In handwriting the perception of form precedes its reproduction and is made more precise by the effort of reproduction." (16, p. 25). This is also true of shorthand.



In the beginning stages the students as well as the instructor make the sounds as well as the responses. In their home work, students are instructed to "pronounce each word carefully as you write; associate the symbol with the sound as each division of the word is spoken; practice until the sound causes the symbol to be written automatically." (18, p. 9-10). This gives an additional association between sound and symbol. Experimentation has shown that, generally, the more impressions and more forms of impression one gets of a thing, the better the memory of it will be.

With the simple alphabetical sounds the student learns also that a single stimulus-response will not only express a sound but may express a whole word such as "be, but, it, at, and so forth." Since such words are expressed by single symbols it is necessary that they be memorized as responses to single sound-stimuli. This is economical of time, effort, and learning, because they are used so often. These words are introduced at the same time the symbol for the expression of a single and similar sound is given. The dictator is instructed to dictate "t, at, it." Students respond with the ( / ) symbol. The association of "t, at, it" is thus made through rote memory at first and through context later. Other letters of the shorthand

alphabet are taken up in a similar manner. Drill is given until the stimulus-response unit is firmly established. As the number of shorthand tools is increased and the background becomes broader, more associations and more generalizations of principles are possible and the instructor, using the "Analytical Method," should not permit an opportunity for emphasizing these associations and principles to slip by unobserved and unused.

These single symbols and other highly abbreviated forms for the expression of words that occur frequently are called "brief forms." The shorthand outline for a "brief form" word may represent only one or two of the sounds that compose the word. For example, "v" ( ) is the shorthand symbol for "have" and "pt" ( / ) for "part." Now the student has learned to respond with a shorthand symbol for each sound or group of sounds (pattern form), which he hears. In the writing of "brief form" words, however, it is necessary for him to respond to only a part of the word. Often during the early processes of learning, the law of readiness plus long-established habit, will take precedence over the newer and more effortful writing and forms written in full will result. It is only through thoughtful repetition that the association between symbol and word can be established thoroughly.

In accordance with the "Analytical Method" after the students have practiced writing in the class for a time and their arm muscles are beginning to tire, the instructor calls for translation of the symbols which the students have written. This brings in the additional memory aids of speech and hearing to assist in fixating the association.

The next step is the acquisition of "pattern forms," which means a transferable unit of more than one stroke, expressing a group of sounds. Here the student learns the principle of joining compound symbols to express a complex sound. "If the symbol has been heard, practiced, and identified as a "unit of transfer," the new uses will be more simple than if the unit has been taught as a part of a word without the suggestion of transfer, as for example the element 'son' in the word 'crimson'." (19, p. 7).

In order to make sure that the student learns these pattern forms as units of transfer, the instructor presents the symbol first as a response to a certain sound-group and later as part of a word. The student learns to respond to "son" before he responds to words containing "son." In the texts used in the older methods of teaching, words were arranged in vertical lists with the shorthand outline opposite each. The student was instructed to "write each word five times," or "be able to write the

correct forms for all of the words in the list." The result was that the student set out to memorize the shorthand outline for each word in the list. Perhaps ten or a dozen of these words contained the element "son," but the student did not see the relationship between these words. The "Analytical Lessons" has no such word lists. Shorthand outlines are used only to illustrate principles or to express forms for certain isolated "brief forms." The word lists are arranged in groups according to their common elements and are written horizontally in regular paragraph form. The lists are analyzed and studied in class before homework assignments are made from them. The instructor dictates the words in sound-syllables and the students respond with the shorthand symbols for these sounds. Thus, in teaching a list of words containing the element "son," the teacher dictates "crim-son," "par-son," "pri-son," and so on through the entire list. Through this repetition the "son" ( / ) response becomes so firmly established that the student is able to "pick it out" even when the words are not analyzed in this manner. The symbol response for the transferable sound-unit is learned and the student's interest is maintained at the same time through a wide variety of words.

The "sound picture" idea is carried out in the pronunciation of words in the beginning classes. The word



"production," for example, would be pronounced "pro-duction," thus aiding the students in their choice of symbols. They respond with a pattern form for each sound-group without thought of the word in full. By this method of teaching transferable units the "Analytical Method" has made great advance over the older methods in which the form for each word was learned by rote memory and the student was unable to write an outline for an unfamiliar word because he had had no practice in uniting (associating) the forms in the various combinations. In the "Analytical Method" the student manipulates his shorthand tools (symbols and pattern forms) in new orders to meet the sounds of the unfamiliar words because he has had specific practice in this kind of exercise and has had the basic principles of combination taught to him. Each symbol and pattern form is taught with a view to transfer from one word to another.

"The repetition that has been insisted upon, and is still planned for by many excellent teachers, is the frequent presentation of the same words in order that they may be readily recognized by the pupils. This is the weakest and least productive kind of repetition. It depends on mere memory cultivation as the means of making progress. No method that makes memory the central and direct element in learning can long sustain the vital interest of children in any subject." (27, p. 35).

"The writing of one hundred correct shorthand outlines once each has a greater value toward automatizing the principle than the writing of ten outlines ten times each." (18, p. 14).

All the word possibilities are emphasized with the addition of each new letter. This has three advantages:

1. Strengthens old responses by repetition but without discouraging the pupil. In the writing of words shown in the chart (see p. 25), he is interested in the word-building process and does not realize that he is writing "ka" (o) each time he makes another word.
2. Introduces all new words possible beginning with "ka". The similarity of known words with new words is thus brought out. The student sees the relationship clearly and feels he is building words, not just memorizing a list of new forms.
3. Translation will be easier if he is familiar with all words which have the same outline.

"Parts should be taught not as isolated units but with an understanding of how they fit into the complete game (word)....Where it is possible to build up definite sequences of parts, they should be taught in what has been called the 'progressive part method'. The first fundamental should be learned well, then the second; then the second should be joined to the first; then the third, and so forth." (40, p. 65).

The students must be given practice in joining the symbolic responses to "pattern forms" to make words com-

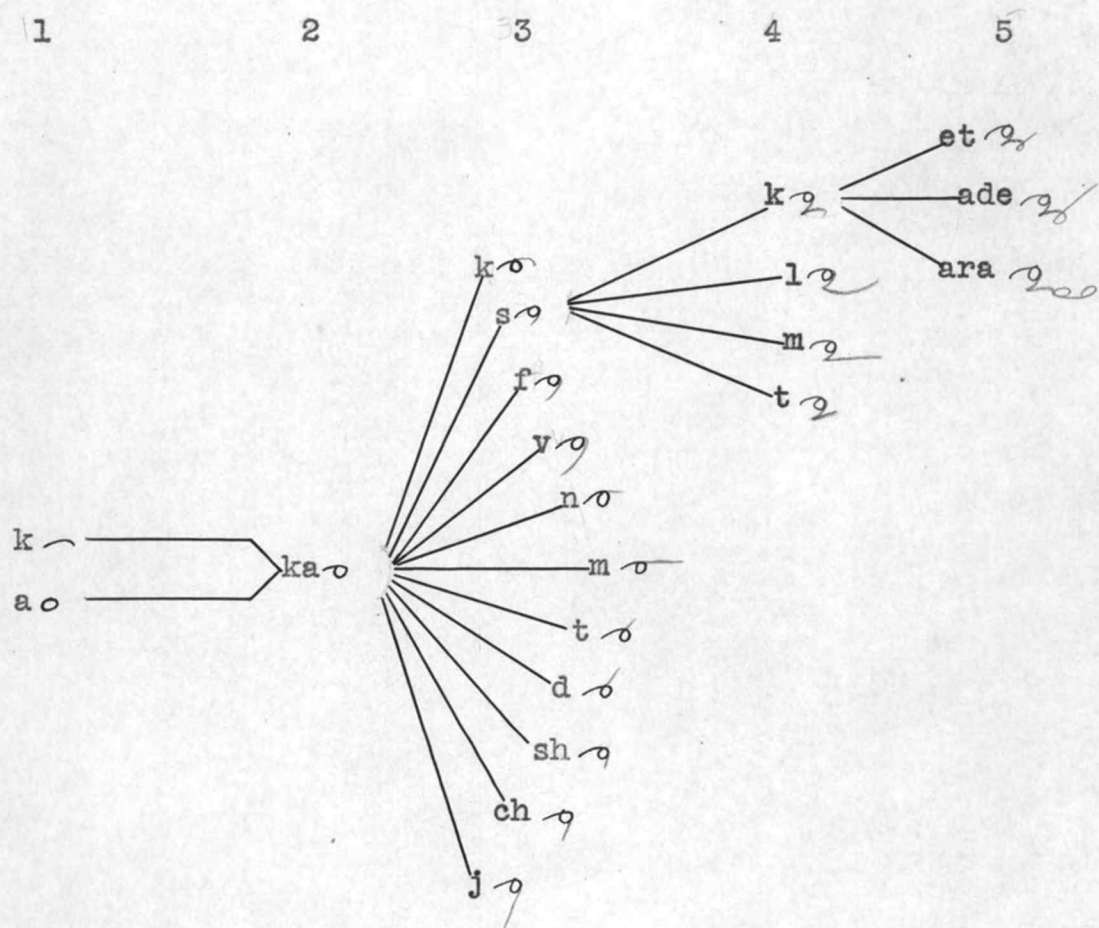
posed of several pattern-forms or symbols. It is not sufficient that they respond to the sound with the symbol for that sound, but they must join the symbol in the exact order in which they hear them to form the correct outline. An analysis of perception by psychologists shows that there is a tendency for stimuli which are being received to group themselves and form larger units which result in association-chains. For example, in hearing a familiar tune, we are able to recognize or perceive that we have heard it before because the sensations which stimulate the auditory receptors arrange themselves in certain groups. Grouping is a valuable aid to the shorthand teacher. It is her business to see that grouping occurs, guided correctly by her pronunciation of the words. Thus the students hear "men-d." They have learned that (—) is the pattern form for "men" and ( / ) for "d." The problem, then, is the joining of these two responses in the order in which they hear them and with as much continuity of writing as they would show in writing the word in longhand, as "mend" (— / ).

It must not be supposed that the student learns responses for every sound before he begins to join the commonest sounds and to write the most frequently used words and sentences. Responses to new sounds, and new combinations of responses to the same sounds, are being learned during the entire first year of study. After the student

has learned a few of the basic principles such as the fact that any sound may be expressed by a shorthand symbol, and that these symbols are written in a manner analogous to longhand writing, he is taught to combine the basic symbols into words of increasing length by a gradual progression from the simple to the more complex.

We have here an example of the acquisition of skill through the utilization of the "hierarchy of habits," defined as "a grouping and fusing of simple habits into habits of higher and higher orders." (47, p. 176). In the learning of shorthand the student learns to respond to each sound with a symbol. The next step is the connection of these symbols to make a single outline in response to two sounds, then three and so on. With the addition of each new letter the response to the unit preceding tends to become more unconsciously performed or automatized. The attention is transferred from the letter to the syllable and then to the word as the unit of stimulation. The following diagram will illustrate the way in which the hierarchy of habits applies to the learning of shorthand:





The chart illustrates the gradual presentation of the symbols from the simple to the complex. The symbols are presented in easy stages in order that the student may take up successfully one step at a time in an orderly progression the mastery of the subject. Success usually encourages the students to attack the next step with enthusiasm whereas failure or uncertainty often leads to confusion, discouragement, and defeat. To perform an act successfully gives satisfaction, which in turn stimulates the student to further action. This is commonly known as the law of effect. The students usually are interested in the word-building process as illustrated in the chart and, as a result, concentrate their attentions on the forthcoming sound stimuli and their corresponding responses. This situation is highly favorable to the learning process and utilizes the law of intensity. "Exercise involves also intensity and duration of responses as well as the way they (the stimuli) are grouped together in time; effect is modified by the degree of attention paid to the situation and response and by the recency of the formation of the bonds." (36, p. 191).

Some of the methods of presentation in which memory of an outline for each new word is the basis of teaching, take as their justification for this the fact that whole

learning is superior to part learning. This is, however, a sophistry as the terms do not apply to such a learning situation.

Another great hindrance to learning by these methods is that the student is obliged to learn many rules pertaining to the joining of one symbol with other symbols before taking up the writing of any new symbol. The "Analytical Method" has adhered to the principle that instruction should be based on comprehension and induction. Words illustrating the principle are dictated and demonstrated before the rule is even mentioned. It is not the best psychology nor the best educational theory to think that the pupil first masters a principle and then automatically applies it to all of the cases in which its implications are met. To teach shorthand by having the student learn all the rules and all of the exceptions to a certain situation before he attempts to write the words to which the rule applies, is like marking a trail through a dense forest by blazing all trees except those on the trail. It is much less confusing to mark only those trees along the trail, that is, dictate words which the student can write and to which the rule applies, making the wording of the rule of secondary importance and the application of the rule of primary concern.

"This book (The Analytical Method of Teaching Gregg

Shorthand) is arranged with the express purpose of dispensing with rules requiring knowledge of formation in the beginning work and of substituting therefor laws of continuous motion." (19, p. 17).

Through proper phrasing of words to bring out pattern responses many possible rules need never be mentioned formally because the student will usually make the joinings in the proper manner without them. An attempt is made all the way through these analytical and developed lessons to keep the number of rules which the student must learn to a minimum. The emphasis is placed on "do" rather than on "talk about." The "Analytical Method" builds up by illustration and demonstration ahead of, and along with, the general truth or principle so that the student can better understand the principle through instructive experience and concrete knowledge rather than through reliance on memorization of rules apart from practice. The applications of the rule contribute greatly to its understanding. Take for example, the rule of circle placement found in a popular text:

1. At the beginning or end of a single curve, the circle is placed inside the curve.
2. At the beginning or end of a single straight stroke, the circle is written with the right motion.
3. When an angle or point is formed at the junction of consonants, the circle goes outside the angle.





4. Where straight strokes and curves join without an angle the circle is placed inside the curve.
5. Between straight strokes in the same direction the circle is written with right motion.
6. Between opposite curves the circle is turned back on the first curve.

It can be seen readily that if the student was required to memorize all of these specific instructions without illustrative practice he would be so encumbered with rules that confusion and "halting writing"<sup>1</sup> would be the result. In the "Analytical Method" a list of words is given which illustrates a certain rule, for example, the first part of the one above, placing of the circle inside the curve. The students analyze the words in the list and discover that the words are alike in this respect and thus they are led to formulate the rules of procedure.

There is, also, the omission principle. It is not sufficient that the student learns a response for each sound or combination of sounds which he hears, he must also learn when to refrain from writing unnecessary sounds. Unimportant sounds, syllables, and words are omitted in writing shorthand. Therefore, the student must learn to respond only to the most important elements of the word and word-groups, symbols or pattern forms. When he hears

1. "halting writing" - writing with hesitation and jerky, ill-coordinated movements.

a sound, he must be able to recall almost instantly whether or not a symbol is to be made and the nature of the symbol--if one is to be written. Mastery of the omission principle or "abbreviating principle," as it is called, is most difficult for the learner of Gregg shorthand. The instructor will better understand the reason for this when he realizes the psychology back of it. The student has, up to this time, learned to respond to each sound he hears except in the "brief forms" which are memorized outright and generally cause little difficulty after the first few lessons. In all other cases he has responded to each sound or sound-group which he hears. Now the abbreviating principle is introduced and he is forced to cut short his symbol-response although the sound stimulation still continues. Thus in the word "absolute" he finds that the correct form expresses only "abso" (  ); "lute" is not written although the sound stimulus is presented. Still more confusing is omission of a syllable in the middle of a word such as in "execute," written "ex-cute" (  ) with the "e" omitted. Often the law of readiness will take precedence in the early stages of abbreviating practice and the complete word will be written even though the student has been told that all words in the entire list are to be abbreviated. Negative adaptation,

that is, learning to refrain from action, does not take place through mere telling, but must be accompanied by satisfaction and dissatisfaction. Practice and correction is the best way of accomplishing the desired result.

Some teachers, however, become discouraged about the progress of the class in abbreviation and resort to the rote memory method, thus treating all abbreviated words in the Manual and supplementary texts as "brief forms."

This method has two disadvantages:

1. There are too many words employing this principle to make rote memory an economical method of acquisition.
2. The student would be unable to apply the principle to new words which might come up in later dictation.

The "Analytical Method" solves this problem by dictating the words in the exact divisions to be expressed by the pattern forms until the student has gained some facility in the writing of them. In dictating the word "execute" the instructor emphasizes thus: ex (e) cute. This is called phrasing the outline. The student, by the time of the introduction of this "phrasing," should have mastered the elementary steps and should give the correct response without much assistance. The student will revert to the use of the full form many times, however, and only after much drill will he be able to apply consistently the principle of writing only the more important syllables of long

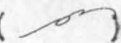
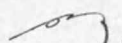
words and of writing only enough of these to enable him to "read back" correctly.

The psychological law of associative shifting is in evidence here. Conditioning or associative shifting plays an important role in the learning of shorthand. The student must respond with the symbol for "b" when "able," "ible," are presented. This is a familiar response to new stimuli. He must also respond with a new symbol to familiar stimuli as in "presume" where he responds with "pr" (C) instead of "pre" (C).

Another device which assists the students in mastery of the abbreviating principle and is also of great assistance in translation, is the teaching of "like outlines." Many groups of words with different meanings and sounds are expressed by the same outlines in shorthand. The learning of these words as groups, greatly facilitates the learning process. For example, we have the shorthand outline "ak" (o) which is used to express the words "ache, act, acknowledge," and the phrase "I can." By dictating these words in a group the student comes to associate the one shorthand outline with the whole group and also to associate the words with each other. This associating the words with each other is an aid in remembering the shorthand outline and is also an aid in the translation of the outline.

In many other cases the partial response is omitted



altogether, as in the phrase "day or two ago" (  ). The student has learned the response symbol for the words "or" and "ago" as well as for the words "day" and "two." Now he is taught to omit the response for "or" and to give a modified response for "ago" (omitting the response for "a" in the word "ago"). The shorthand outline which is actually written to express this phrase then is "day two ago" (  ).

Through the word-building process used in teaching shorthand by the "Analytical Method," the student gradually increases his vocabulary from the simple one-stroke symbol to words of many syllables as illustrated in the chart on page 25.

"The child's power in any subject increases most rapidly and most definitely by overcoming a related sequence of well-graded difficulties; by solving a well-arranged series of increasingly difficult problems. Problems in word recognition may be given as definitely and as systematically as in arithmetic or any other department of mathematics or science." (27, p. 30).

It is advisable that as much learning and relearning be eliminated as possible. Therefore, outlines are presented in the most economical manner of writing symbols when they are given for the first time. In the very first lesson phrasing is introduced. As mentioned previously

"brief form" words are given at the same time that the symbols as responses to single sounds are introduced. But more than that, phrasing of these words is also introduced at this time. It is not sufficient that the pupil learns that ( / ) is the response for "at" and ( \ ) is the response for "the." He learns that these two symbols can be joined to form the phrase "at the." The dictator groups her words so that the student experiences the least difficulty in knowing what words to phrase. This method is far superior to teaching the responses separately and later attempting to get the students to join them. Thus, in the first unit the student is able to write sentences such as "he-would-not go haying in an hour," ( / — \ — ) as correctly and economically as he will ever be able to write them. The first lesson deals with circle vowels, forward curves, and straight lines. Simple sentences such as the one given above, give practice in the rules applying to the joining of these characters. Difficult phrases for the most part are carefully eliminated until later in the course rather than teaching the elements separately, making combination a necessary, separate act later. Vowel markings are another wasteful procedure. Ordinarily the context will make the meaning of a word clear. The student is taught to associate all the possible translations of any particular outline rather

than to learn and use the wasteful process of vowel markings, e.g., in dictating and translating the shorthand outline "ek" (ㄣ) all possible translations are given--ik, ek, eke.

But the rapid writer does more than recognize familiar parts in new words and see economical phrases. He has developed "carrying power," that is he is able to keep his responses coming a certain distance behind the stimuli. The symbol responses for the more difficult outlines and phrases are recalled and arranged in proper order in this interval between the reception of the stimulus and the writing of the shorthand response. "Carrying power" is a great aid to the shorthand writer because it enables him to "keep up" with the dictator. Seldom is dictation given in an even, rhythmical manner. The dictator usually speaks as he thinks, sometimes rapidly, sometimes slowly. If the shorthand writer has not developed "carrying power" he will have difficulty in writing outlines fast enough at times. Through the development of "carrying power" the writer will not need to write at such a rapid rate since he will be able to "catch up" during intervals of slow dictation or pause.

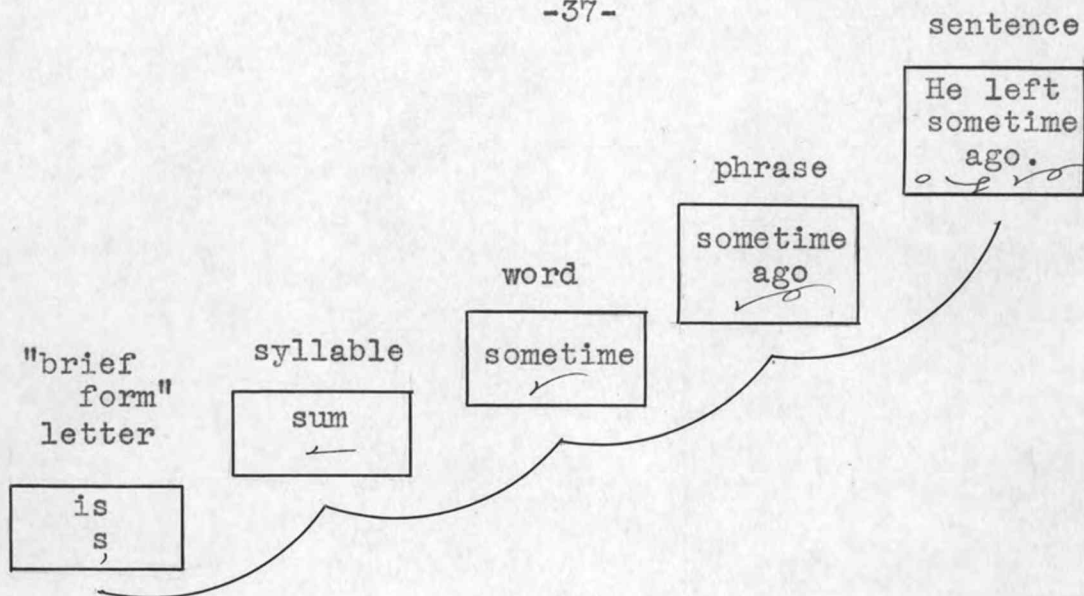
"Carrying power" is also necessary for efficient phrasing and punctuation. Outlines for many commonly used phrases are no longer than outlines for single words and

through the development of "carrying power" the writer is able to group these words and recall the symbols before attempting to make the outlines. It also affords him additional time to focus attention on difficult words since the outlines for familiar words are recalled almost as soon as the words are heard. Book found a similar situation in typewriting where the student read several words in advance of the particular word he was typing and focused attention on the more difficult words and finger combinations. "Carrying power" thus results in a more continuous writing both in shorthand and typewriting.

At first "carrying power" may be very limited, being confined to a lag of only one word and, if the word is long, perhaps even the syllables will be mixed. Familiarity with the shorthand symbols and practice in "taking dictation" soon develops carrying power so that the student is able to complete phrases and short sentences after the sound has stopped. Practice in developing this shorthand aid is given by instructing the students to listen to the dictation and begin writing when the dictator stops. The length of dictation is gradually increased as the student is able to remember longer passages.

The following illustration summarizes the manner of presentation used in the "Analytical Method" of teaching Gregg shorthand.





The acquisition of shorthand skill is a gradual and systematic growth from the smallest unit--a symbol response to a single sound--to the highest, the expression of a complete thought (sentence) in shorthand symbols. The only place where a step is omitted is in the teaching of "brief forms" at the same time the simple alphabetic symbol is learned as illustrated in the diagram.

### Writing Process.

The writing strokes are essentially the same as longhand. More care, however, must be exercised in their formation since, in many cases, the size and length of the symbol as well as its general appearance determines its interpretation. This can be seen readily by a comparison of the triplet group "n" (—), "m" (—), "men" (—). The possibility of confusing the shorthand symbols is much greater than the possibility of confusing the longhand

letters because slight differences in the lengths of the lines of symbols are the sole determinants of the meaning. The beginner may feel that the process of writing shorthand is very much different from longhand writing, but the manner of holding the pen and the muscular movements of hand and arm are the same in both forms of writing. The forward strokes in shorthand "n, m, r, l," ( — — — ) and the upward forward strokes "t, d, ted," ( / / / ), together with the blends of these strokes, are written with a forward muscular movement. The downward characters, "sh, ch, j, p, b," ( // // ) are written with quick finger flexions. While these movements have all been made in part many times by the beginning writer of shorthand, they were not usually isolated and they were in different situations and had different connotations. "The learner's attention and energies cannot at first be applied to the writing in a direct and economical way. Under the influence of a strong desire to succeed in the new task there are called up masses of old, familiar and easy associations or forms of activity.....From these, there is unconsciously built up by the double process of elimination, selection and reorganization, the first elementary associations used, and from these in turn the later, higher-order habits. There comes to be a sort of unconscious struggle for existence among the many modes of acting, ending in a survival

of the most direct and economical way of reaching the desired goal.....Some of the habits of the earlier stages seem to exist only to be eliminated, but most of them, as well as many seemingly useless mental strivings and acts, play an important role in the development of higher-order habits. They constitute the raw material from which the more direct and economical habits are formed, and are therefore a necessary pre-condition for their attainment. Those not so used must be regularly discarded as fast as outgrown to keep the learner's progress from being arrested on a lower level of attainment than he is capable of attaining." (5, p. 26).

The "Analytical Method" teaches the beginner to gain this control,

- (a) by teaching the shorthand symbols in triplet groups
- (b) through the use of the radiant

Thus under (a) we have the simultaneous presentation of three lengths "t, d, ted" ( / / ). The "Analytical Method" carries the triplet presentation through the entire shorthand alphabet. The shorthand characters naturally fall into groups of three with sizes of one-fourth, one-half, and three-fourth spaces high. These groups are: o, r, l ~ ~ ~

oo,k,g	s,f,v	s,p,b	sh,ch,j	n,m,men
~ ~ ~	~ ~ ~	~ ~ ~	~ ~ ~	~ ~ ~



t,d,tet    th,ten,tem    th,nt,mt    e,a,ya    oo,this,def<sup>1</sup>.  
 ///    (    (    (    ,    ,    ,    ,    ,    ,    ,

The laws of similarity and contrast are utilized in learning the heights and lengths of the symbols. The student has the three symbols before him in his own writing and is able to check up on himself immediately. The method of presenting each symbol separately does not afford the student this chance of comparative checking and the appreciation of relative proportion of size is a far more difficult problem. Under this plan the student struggled with the proportion of "dev," "men" or other blends after he had been studying shorthand for months. The older methods introduced only the single strokes at first and endeavored to automatize these before introducing the blends. The value of study through similarity and contrast is now realized and the "Analytical Method" presents a triplet group in the same time as was formerly used in presenting a single symbol or a doublet (n, m, or t, d).

Under (b) the root form, for example, "ka" (∞) is written but once and the symbols for the various usual word terminations joined to it in drill periods. Thus "ka" (∞) is written and "t" ( / ) is joined to it. Then "kad" ( / ) is written by going over the "t" stroke and extend-

1. "Gent" ( / ) is the only character which does not fit into this triplet arrangement.



ing it to the proper length for "d." Next "ted" is added by retracing the "d" line and extending it to the proper length for "ted." The intersecting lines in the following illustration show the length of each (  ). The same procedure is used in developing the forward and downward strokes. This is called the "radiant" because the upward, forward, and downward characters "radiate" from the root form "ka." The completed radiant from the root form "ka" is then "ka-t, -d, -ted, -n, -m, -men, -s, -f, -v), and appears in shorthand (  ). While the student must think about proportion and size while he is writing, his drill periods should reduce the conscious effort involved very greatly. The beginner must guard against "drawing" the outlines in the early stages of shorthand. The "radiant" is designed to help the beginner in these difficulties.

The use of the "radiant" facilitates fast writing because the hand is not forced to move along the line of a page and the student is able to make the termination strokes very rapidly. As a result, the instructor should soon dictate at the rate of 100 strokes a minute. Thus, from the very beginning, the students learn to respond rapidly to sound stimulation.

The "radiant" has another function also. Through practice with this device the student acquires the "get-

away" stroke which means that he ends his symbols with a fine hair-like line instead of following the stroke to the entire end with the same pressure exerted at its beginning. The purpose of this is the same as that in typewriting or other motor skills; namely, to enable the hand to make a quicker return and be ready to begin the next symbol. An illustration of shorthand symbols will demonstrate this point (//). The first shows a line as heavy at the top as at the bottom; the second shows a line heavier at the bottom, or the beginning of the stroke, which gradually becomes finer showing releasing pressure as it goes up. It is the faster stroke and increases the flexibility of control of hand and its movements. "Instructions in activities which involve groups of small muscles and fine coordinations, therefore, involves first directing the performer through the series of movements, eliminating wrong or useless movements and finally securing the optimal timing of the several components. One of the principle difficulties in instruction (of writing) is that muscular movements are so fast that it is difficult to make such an analysis." (43, p. 22).

Comparisons in writing and reading the "get-away" and drawing strokes should be made by the students themselves in order to make real for them the very great differences between the two. The differences in the man-

ner of executing the two strokes is essentially the difference in drawing a geometric figure and in writing a word.

Rapid dictation with use of the "radiant" will enable the beginner to acquire this stroke much more quickly than lengthy telling procedure or imitation of shorthand illustrations.

In contrast with the use of rapid dictation, employment of slow dictation has two disadvantages:

1. Students form slow habits of response
2. The muscular reactions are not demonstrated or used the same way as in rapid writing

"It has been shown that when a skilled workman performs an activity at a slow speed in order to demonstrate it to a beginner, he introduces important changes in his movements at the same time that he slows them down.....Movements, performed at slow speed, is radically different from fast movements so far as the type of muscular contraction and, therefore, the type of nerve impulse is concerned."

(40, p. 25).

"To do an act slowly is a different psychological process from doing it quickly. It is a false notion that we can learn to do a thing slowly and then afterwards readily increase the rate of doing it. The easiest way is to learn right from the start to execute the act as rapidly as we can." (47, p. 63).

"Emphasis on speed seldom results in neglecting accuracy entirely, whereas emphasis upon accuracy may often result in ignoring speed. If the instructor would talk speed all the time, he would also secure considerable improvement in accuracy, but emphasis upon accuracy may bring little or no improvement in speed." (18, p. 8).

This belief regarding the teaching of shorthand is quite in opposition to the older views which emphasized appearance of characters even to the extent of permitting the beginner to draw the characters. The theory was that if the writer copied from model plates he would become a good writer.

"The fundamental principle of practice in learning an act of skill is repetition. Repetition, of course, may merely habituate the wrong way of performing the act, if the act is not done properly, or if the attention is not so directed as to bring about improvement. But improvement cannot take place without repetition. Discussions (in handwriting lessons) should be distinctly supplementary to practice by the pupil. The greater part of the writing period should, therefore, be spent by the pupils in actual writing. Some of this writing may consist in writing the same words or exercises over again, and some of it may consist in writing new words or exercises, but the rule which should be remembered is that the pupil should be ac-



tually writing the greater part of the time.....The carrying out of the execution of the movement must be learned by the pupil through practice, with his attention fixed upon the result." (17, p. 17-18).

"We can select the correct movements more readily by fixing attention on the result we wish to produce, or in a few cases upon the movement itself, rather than upon the movement which we do not wish to make." (15, p. 131). Ragsdale makes substantially the same statement in his book on Motor Learning--"Think of the movement to be made and not the movement to be avoided." (40, p. 16).

Numerous experiments have shown that under conditions of intensive practice, good interest, concentrated attention, and careful lesson planning, speed and accuracy improve together. Of course, either can be sacrificed to the other. A principal problem of the learner and the teacher is the striking of a nice balance of the emphasis distributed between the two. Accuracy should be stressed somewhat more at first and speed later, but this principle of distribution of emphasis can be abused easily.

"Blind mechanical practice does not promote learning. (The student) should write only from dictation (not from printed pages)." (32. p. 107). This belief is carried out in the "Analytical Method" in that the writer must write from sound stimulation and at the rate of the dictator

rather than from visual stimulation at his own rate.

Therefore, the class dictation is given at a rate of from 60-90 counts a minute and is practiced until the writer is able to give the symbol response at this rate.

"Word recognition has in the past been almost entirely through the eye, but ear problems are much more effective in aiding (the child) to associate the letters with what they say, than eye problems. The child has more to do in solving an ear problem than an eye problem. He has to separate the word to be written into its elements by sounding it; he has to decide what letters "say the sounds" as he makes them; and he has to write letters in their proper order. This makes the association of the letter with its sound very definite. There is no other method of fixing facts, or principles, or associations in the memory that is as effective as using the hand to work out or represent them. When the mind of a child has to guide the hand, the intellectual effort must be definite, and the result on the memory is more positive and more lasting than if no productive or constructive effort is made. Ear problems are of great value, too, because children are made happy by the ability to write words themselves." (27, p. 33;35).


Rhythm is a valuable help in forming and controlling the muscular coordinations. "Proper adjustment of move-

ments to one another in time and also in force is promoted by making the movements rhythmically.....Investigations of handwriting have shown that well-coordinated handwriting is made with greater rhythm than ill-coordinated writing. For these reasons, therefore, it is a good practical rule to develop rhythm in any movement we wish to learn." (15, p. 132).

Sounds (stimuli) are themselves grouped because some of the sounds differ from others in intensity, or in quality, or because the sound elements have a certain relationship to an underlying temporal series.....There is a motor or kinaesthetic basis for rhythm. Miner found that the muscular response to a series of like sounds was in the nature of temporary uniform group waves." (40, p. 31).

"In the perception of rhythm as measured by the "sense of rhythm tests," the factors of basic rhythm and that of kinaesthetic memory are again dominant. Simple memory span in itself is of little importance to the sense of rhythm. Factors of general intelligence, general muscular coordination, and speed are not significantly correlated with perception of rhythm." (40, p. 73).

The psychological factor of rhythm is utilized in the "Analytical Method" in the presentation of the "radiant" and in the dictation of word lists and sentences. In dictating the triplet groups for the "radiant" the sound

stimuli are given in groups of three each, e.g., "t, d, ted," "n, m, men," "s, f, v." Words illustrating a principle are dictated in syllables in a rhythmical way in order that the student may make his shorthand responses in the same manner. A list of difficult words, when written for the first time, is dictated at a slower tempo than a review list of familiar words, but is never given so slowly as to obliterate rhythm. In the dictating of sentences rhythmical grouping is used so that the student may recognize the phrases more readily. The more important and difficult words are given more "time" than the short, easily phrased words, just as the melody is the more prominent part in a musical selection. For example, "John came as soon as possible," would be dictated in three even beats or divisions of time, thus "John / came / as-soon-as-possible." The words "as soon as possible" form a phrase and are written as one outline (  ). The student is aided in the recall of proper responses in this way.

The ultimate aim is almost complete automatization of the writing process. "It may be laid down as a fundamental law that when a child or a man is asked to perform any complex operation, he should be able to give his direct or primary attention to the highest element, or stage in the complex process. The processes subordinated to the



highest should be so thoroughly under his control that he can perform them automatically, or without conscious effort. When a child is expressing thought in writing, for instance, he should not be required to think about the forms of the letters. Letter formation should have become automatized, or else the child must give a portion of his mental effort to the construction of letters, and he will have only a part of his mind left to do his thinking." (27, p. 4).

Book's statement regarding automatization in typing is also applicable here. He says, "Failure to recognize the correctness of the individual movements when going right is the first step in the automatization and the beginning of the formation of a habit of the next higher order where the syllable or word is made the unit of attention." (5, p. 42).

#### Reading Process.

In an analysis of the reading or the "reading back" process, one must realize that the stenographer must be able to recall the words which the characters express. The symbolic outline which the student has made must furnish sufficient clue for the identification of the word or idea in full English form. The student has learned to write from sounds and he should learn to translate in the

same way. In the first reading practices, he will find it necessary to sound out each word. He must learn, not only to know a sound for each symbol and pattern form, but all of the sounds expressed by that particular character.

To read means "to think" as truly as does "to evaluate" or "to demonstrate" or "to verify." This point of view demands a method that will provide the necessary technique for a variety of responses to the material read. A first reading should come as a pleasurable experience and for that reason the first lessons which serve as transition lessons must treat of familiar experiences and contain very few new words. All types of lessons for the gradual development of reading skill should follow throughout the series of lessons.

From the beginning teaching by the "Analytical Method" follows the practice of dictating all possible translations each time a certain character is given. Since the student knows what sounds are expressed by the basic symbols and pattern forms because he has had practice in writing the words in full, he will not find it as difficult to determine the meanings of the shorthand symbols as if he had learned them by rote memory or on a higher level of difficulty than the elementary introductory forms used at the very first in the "Analytical Method." An example is "meet" ( — ). The shorthand symbols of "m" ( — ), "e" ( • ), and "t" ( / ), are

used and the student can arrive easily at the pronunciation of the word by sounding it out.

However, as the student gets into more advanced work, he may experience some difficulty in getting the meaning from the less obvious clues of the "abbreviated forms." He is assisted greatly at this point if he is able to pick out the pattern forms in the outline and knows the various prefixes and suffixes expressed by each form.

"Analysis of words cannot be omitted from any complete training of pupils. A child can read without analysis as long as his vocabulary is small and words are short, but sooner or later he must make analyses, and then he will be helped greatly if he has been trained in a systematic method." (54, p. 94). While the quality and quantity of the vocabulary are important factors in the construction of this series of lessons, of equal importance are the distribution and repetition of new words. The gradual introduction of new words in relation to the number of reading words is a definite aim of the "Analytical Method." Frequent repetition of the basal vocabulary in various situations is necessary to insure mastery. While frequent repetition is important it is also essential to provide for continuous use of all the words to insure their retention.

In reading phrases and sentences written in shorthand

it will probably be necessary for the beginner to sound out the symbols and review many or all of the possible words for a single outline before he is able to choose the correct one. He may even then choose the incorrect translation and discover his mistake when he has read several more outlines and finds that the word he chose does not make "good sense." For example, in the sentence, "The cat licks the milk" ( *( r s o r e )* ) the student may have learned that the symbol ( *r* ) when alone represents "the"; he may have little difficulty in sounding out the outline for "cat"; but when he comes to the word "licks" he may find it necessary to review all the possible words for the outline before making his choice. Thus he may sound out "licks," "lecks," "leaks." The second is eliminated at once because there is no such word; the third is eliminated in view of the translation of the two preceding words; and "licks" remains as the logical translation. As the student's skill increases, less and less of this trial-and-error translation is necessary because the student learns what translations and sequence are usually found together, that is, he learns to rely more on the context than on isolated symbols. After considerable practice this sounding-out process is greatly speeded up and, in the advanced student, amounts to only a slight hesitation in most cases. Through much practice in both reading and writ-



ing shorthand the student is able to approximate the oral reading rate and can read with as much word grouping and expression as he can from material expressed in full form. He has progressed to the higher levels of the hierarchy of habit formation in his translation.

### Transcribing.

In most cases the shorthand writer is required to give typewritten rather than oral translation of his notes. The reading process is essentially the same--with the exception of vocalization. In the beginner, lip movements are prominent and this is true of some advanced students just as with some people who, when reading from a printed page, pronounce each word nearly in full as they go along. This vocalization is the exception for the advanced writer, because any marked motion of the lips retards the rates of reading and of writing. The writer reads from his shorthand notes much as if he were reading from printed matter, except that the rate is slower because more time is necessary to re-form from the shorthand notes. The typing is rarely as smoothly continuous as when one is typing from printed matter because of questions which arise in the mind of the student about the meanings of certain outlines which have more than one meaning as is the case with most outlines.

PRINCIPLES OF EDUCATIONAL PSYCHOLOGY INVOKED BY THE  
ANALYTICAL METHOD OF TEACHING GREGG SHORTHAND

The Importance of Analysis of the first steps in a learning process. Too often in teaching, the importance of the analysis of the first steps in the learning process has been overlooked. This analysis, and the development of suitable lesson plans to coincide with the analysis, are the most important educational factors in both the teaching and the learning process. Just because the expert knows, through countless repetitions and special interest, the elementary processes does not mean that he learned them instantly or that he did not have to learn them at all. To condemn the beginner who does not learn the elementary steps almost instantly is a stupid procedure.

For the beginner, the elementary steps are the most difficult because they are new, because they do not have much meaning, because they are based on rote memory, and because they are usually placed in the emotional setting of a beginner's self-doubts and fears. As a compensatory factor, the beginner usually has the fresh interest, enthusiasm, and energy that are fostered by the novelty of a new undertaking. This very enthusiasm, however, presents a difficulty as well as an advantage. It may lead to undue emphasis on speed instead of accuracy or an assumption of credit for greater skill than really exists. This leads

rather inevitably to carelessness and superficiality of learning unless it is checked by lesson plans, drills, and tests that have been developed carefully to prevent the formation of bad habits of performance, to foster good habits of performance, and to establish the criteria of speed and accuracy that have proved most suitable by observation of student performances.

This analysis of the elementary steps of the learning of a subject and the development of coinciding lesson plans, removes much of the guesswork from the teaching of this subject-matter. Because the material is adapted to the ability and development of the pupils, the morale of the class-room is better and there is greater satisfaction in teaching for the teacher. The "Analytical Method" has carried out this analysis of the first (and later) steps and has developed lessons based on this analysis which are scientifically devised and experimentally proved.

Law of Success. Closely allied in many ways with this experimental analysis of the elementary steps of the learning problem is the employment of the "law of success." The "Analytical Method" makes very definite use of this law by providing orderly progress from step to step in learning, by alternating drill and the apparent accomplishment of context writing, by allowing for definite measure-

ment of accomplishment, by offering devices that provide for competitive efforts, and by planning for learning by doing rather than the following of an unrelated series of rules. The "law of success" states that an act whose outcome has been, or is felt to be, successful is learned more readily and more thoroughly than an act whose outcome is, or is felt to be, unsuccessful. The use of the "radiant" gives increased power of word or symbol recognition in the many combinations and situations in which it is employed and, through this, promotes knowledge of accomplishment and the pleasant feelings accompanying it.

Orderly Progression from step to step. Through the use of the "radiant" order and system are introduced with consequent decrease of effort necessary to hold a large number of unrelated symbols in mind. The "radiant" has at any one time a single base unit with many variables at the ends of the numerous radii. For the beginner, these radii are few in number and the variables at their ends are the simple, basic signs of shorthand. As the learner progresses the number of radii of the "radiants" are increased and the degrees of complexity of the sign-variables are extended--not simply changed--but extended in the form of making of each variable a minor radiant in turn. Thus, the learner progresses from the smallest, simplest signs



to the most complicated patterns in a continuous, uniform manner with no gaps in the learning for the learner to bridge somehow and with no periods of partial unlearning of the simpler signs in order to make them fit into the more complicated symbols. This carefully conceived and developed system of lesson plans of the "Analytical Method" may well be studied by teachers of any subject.

#### Alternating Drill and Apparent Accomplishment.

Another phase of the use of the law of success is the alternation of periods of drill and periods of writing subject-matter. The usual longer practice periods must be divided among a variety of activities; otherwise the amount of learning which takes place will not be commensurate with the amount of energy expended. The conservation of energy and the time of both the teacher and the pupil should be one of the main considerations in the development of such a course. This may be achieved by the building of a very practical technique and of equipment designed to gain the best objectives in this field. At first this subject-matter is more or less formal and memorized by repetition. Its employment is psychologically justifiable, however, as it usually gives encouragement through apparent progress and makes increased energy available for the more basic and fundamental but usually

less interesting drill. Learning which is self-motivated and done "for the fun of it" is acquired more quickly, is learned more permanently, and has more associations with allied material than learning done because of compulsion or a sense of duty. Especially valuable is this feeling of progress in carrying the interest of the learner over when he is on a plateau in the learning curve. It is on a plateau or a "period of no apparent progress" that the injurious effects of discouragement are most prominent. Most of the people who discontinue a learning program, discontinue it while they are on a plateau of learning. Any legitimate device which prevents undue and really unnecessary discouragement and which conserves learners to a legitimate field of activity is a worthy device.

#### Definite Measurement of Accomplishment.

The frequent use of short time-trials and the careful checking of errors in both the writing and the transcription of the shorthand symbols are provided for in the lesson plans used in the "Analytical Method." This is another phase of the employment of the "law of success." The instinct of competition is one of the most powerful of the instincts. It is closely allied with the law of success in its operation. It is probably the greatest single energizer of learning. Of course, the spirit of competi-

tion can be misapplied or used badly but that does not negate its actuality or its importance when well used. This competition can be formulated so that each student competes with his own previous record or it can be held between members of the same class or between classes or even schools. There is little theory developed about the instinct of competition but there can be little question of the very great importance and force of this instinct when used well as an energizer of learning.

#### Automatization vs. Memorization of Rules.

Another phase of the employment of the law of success by the "Analytical Method" is that of automatization as opposed to the memorization, more or less apart from the learning act itself, of a more or less heterogeneous set of rules. It is a truism, but one not always followed in practice, that the way to learn to do (write) is to do (write). In the carefully developed lesson plans of "Teaching Gregg Shorthand by the Analytical Method," the new steps are employed in actual writing as they are learned.

#### Avoidance of Dependence on rote memory. Not only are the new steps employed but they are carefully superimposed upon the older steps until the whole is united into a coherent, orderly, and systematic process instead of the amorphous mass of unrelated detail that usually results from depen-

dence on rote memory. This is done in the use of the "radiant" and still more in the carefully developed lesson sequence with the emphasis changing from drill to the writing of new material as the learning progresses. As the new signs and patterns are learned they are removed, by practice in writing, from the field of entirely conscious control to that of almost unconscious control or automaticity. This leaves the field of conscious control free for attention to new signs and new steps, in other words, free to continue the orderly and systematic progress necessary if one is to become proficient.

Consideration of Fatigue and rest periods. The carefully developed lesson plans used in the "Analytical Method" provide for two other psychological factors that affect the operation of the law of success although they are not, strictly, a part of it. The first of these is provision for the effect of actual fatigue and of ennui. Students tire easily at first because of the unnecessary tension of muscles which they impose upon themselves in their efforts to make accurately the shorthand symbols to which they are unaccustomed. In addition, the drill on the earlier elements of the subject is rather meaningless rote memory to them and they are not always able to see the progress which they are actually making. In the "Analytical Method"



drills are alternated with other kinds of work.

Sustaining Interest in practice. One of these is the actual writing of more or less memorized material in the early lessons and of new material in the later lessons. Other devices that provide rest and change are: translation periods, instruction periods on new symbols, demonstration periods, concert reading, and lessons in the history and development of shorthand. The "Analytical Method" favors much concert reading because "if properly conducted it will speed up both recognition and perception. The laggard is unconsciously swept forward and gains in spite of himself, whereas in individual reading he sets his own pace." (19, p. 39). If this and other devices are correctly planned and placed, they not only provide rest and variety from routine that may easily become drudgery, but they sustain, in a positive manner, the interest that has been created. They give, also, time for the correction of characters that have been incorrectly or carelessly made. In this way they contribute to a definite appreciation of accomplishment as the number of defective characters decreases from day to day. Moreover, at the beginning of the class period and after each rest or change period, the student is again ready to write. This involves the use of the "law of readiness."

The Law of Readiness.

When the student enters the class-room or is rested after a change period, he is interested in writing shorthand. He may be fascinated by watching the instructor write some characters on the board and explain the meaning, but his main interest is in trying to make these hieroglyphics himself. In the "Analytical Method" the instructor explains the new characters briefly, gives a short demonstration, and then follows the material of the lesson plan which provides the employment of the new symbols among the old by the students. The students are "set" to write shorthand when they come into the room; therefore, it is better to let them make the shorthand characters than to spend the period giving a list of "do's" and "don'ts" regarding the importance of proportion, manner of formation of symbols, and other details of the writing without writing by the students. The instructor vitalizes the course through action on the part of the students and does not destroy their interest through lengthy explanations and the requirement of many rules. Furthermore, the teacher should appreciate the axiom that the bright pupils will generally need driving if they are to work at their most advantageous rate while a similar amount of driving will doubtless result in confusion for the slow student. The "Analytical Method" attempts to make the learning of

shorthand so simple that even the slowest members of the class will experience satisfaction of getting the correct responses, and yet it provides a field in which the quickest will find ample opportunity for improvement.

### The Importance of Overlearning.

A psychological factor of very great importance that has been neglected in too many classes is the development of overlearning. Overlearning is the learning which occurs after one is able to go through an act once, correctly, and without assistance. Subjects or subtopics based principally upon memorization, or rote memory, are usually not learned much beyond the point of learning--if they are learned that well. This is especially true of the first lessons on which most subsequent lessons are based, but which are often uninteresting in themselves. These are often learned only superficially because the learner is interested in "getting on." Unless the learning of this material is re-introduced in a new form in the subsequent lessons, it is not learned and the learner is handicapped severely in his program. In the "Analytical Method" careful consideration of the value of reviews is given in the material of the lessons themselves, that is, reviews are not only talked about but they are presented. In addition, the presentation of new material is so devised that much of the new material is actually extension of material pres-

ented to the pupil earlier. This brings about the result that each presentation of new material is a more or less unconscious review of the old material. Thus the development of the hierarchy of habits is followed out and the "new material is linked with the old."

#### Comparison and Contrast.

Among the first stated of the laws of learning are the laws of association formulated by Aristotle. These involve association by comparison (called analogy in "Teaching Gregg Shorthand by the Analytical Method") and contrast. Learning by association takes place more rapidly when objects or ideas are compared with or are contrasted with one another. A definite part of the material provided in the lessons of "Teaching Gregg Shorthand by the Analytical Method" is made up of the points of similarity and of differences of the signs that more or less resemble each other. This is done, partly that they may be distinguished more thoroughly from one another and partly that they may be learned more thoroughly.

#### Vocational Guidance.

A psychological and educational field whose application to the problem in hand is a little more difficult to establish clearly, but of whose application there can be little doubt, is that of vocational and educational gui-



dance. The frequent, early measurement of improvement and the emphasis in the lessons themselves, direct attention to the ultimate probable accomplishment of the student. Account is also taken of individual differences and the part that they play in the improvement which the individual may be able to make. Some individuals are not able to write shorthand because they do not have as great control of the accessory muscles as others. As has been pointed out, much depends on the accuracy of the outlines. This control can be developed, but if the individual has very much difficulty with it, it is better that he do not consider becoming a shorthand writer. If he has to pay too much attention to muscular control he will probably resort to drawing the outlines and this is detrimental to the acquisition of speed.

### CONCLUSIONS

"Teaching Gregg Shorthand by the Analytical Method," is founded upon and developed by means of sound psychological principles.

1. The "Analytical Method" emphasizes the importance of the analysis of the subject-matter of the field from the point of view of the learner rather than from an inspirational or a pseudo-logical standpoint.<sup>1</sup>.

1. In the introduction to the book and in the lessons themselves, this organization has been carried out excel-

2. The "Analytical Method" uses the law of success very extensively in its lesson development. Closely allied with its use of the law of success are its uses of definite measures of progress; orderly progression from step to step; definite methods of sustaining interest; and alternation of drill and change periods to avoid fatigue and ennui and to prevent loss of interest.

3. Automatization of the earlier habits is developed by writing and by the inductive development of rules rather than from the memorization of rules already formulated apart from writing.

4. The law of readiness is used extensively in that definite occasions are created in which the readiness to write is fostered before the writing is begun.

5. Overlearning, a necessary factor in the automatization of skills, is developed through carefully conceived repetitive introductions of new material and drills in different forms. Competition is used extensively in the development of this overlearning.

6. Comparison and contrast are used in the middle and later parts of the book in bringing out more accuracy of writing and firmer comprehension of the symbol development.<sup>1</sup>

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lently. The book is organized around four main headings: (1) hearing the sound, (2) learning the symbolic responses, (3) writing process, (4) transcribing.

1. Many minor psychological factors not mentioned in the summary are to be found in the part of the thesis immediately preceding the summary.

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