AN EXPERIMENTAL STUDY
OF
TWO SHORTHAND SYSTEMS
by
NORMAN SANGSTER

A Thesis submitted in Partial Fulfilment of the
Requirements for the Degree of
MASTER OF ARTS
in the Department
of
EDUCATION

THE UNIVERSITY OF BRITISH COLUMBIA.
APRIL, 1937.
AN EXPERIMENTAL STUDY OF TWO SHORTHAND SYSTEMS.

Table of Contents.

<table>
<thead>
<tr>
<th>CHAPTER</th>
<th>Title</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>The Experiment:</td>
<td>1-3</td>
</tr>
<tr>
<td></td>
<td>1. Purpose of the Study.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. Description of Procedure.</td>
<td></td>
</tr>
<tr>
<td>II</td>
<td>The Detailed Results:</td>
<td>4-11</td>
</tr>
<tr>
<td></td>
<td>5. Test 5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6. Test 6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>7. Test 7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8. Test 8</td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>History of Shorthand Principles</td>
<td>12-16</td>
</tr>
<tr>
<td>IV</td>
<td>The Basic Principles of A Good System</td>
<td>17-33</td>
</tr>
<tr>
<td></td>
<td>1. Longhand as a Basis of Shorthand.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. Curvilinear Motion.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5. One Thickness -- no Shading.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6. One Position.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>7. Lineality -- the Easy Flow of Writing along the Line.</td>
<td></td>
</tr>
<tr>
<td>V</td>
<td>Conclusion</td>
<td>34-36</td>
</tr>
<tr>
<td>APPENDIX:</td>
<td>Supplementary Observations</td>
<td>37-59</td>
</tr>
<tr>
<td></td>
<td>Copies of Final Tests.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>An Outline of the Methods,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>employed by Gregg and Pitman in expressing Sounds.</td>
<td></td>
</tr>
<tr>
<td>BIBLIOGRAPHY</td>
<td></td>
<td>60-61</td>
</tr>
</tbody>
</table>
CHAPTER I.
The Experiment.

The purpose of this study is to give the results of an experiment in the teaching of two different systems of shorthand. The classes were held in the Fairview High School of Commerce and the systems used in the experiment were Gregg and Pitman. The teacher of each system was aware of the experiment and was interested in showing the superiority of his system.

Two groups of students, taking a one year intensive commercial course, were selected for the experiment. At the beginning, there was one class of forty students, all girls, taking Gregg Shorthand, and two classes of forty girls each, taking Pitman Shorthand. Two years of training in the general academic course was a prerequisite for entrance into either group. The groups were made comparable as far as possible, the bases for selection being the I. Q. and the previous academic record of the student. Both groups took the same general course and had the same teachers, except for Shorthand. The other subjects of the course were Bookkeeping, Business English, Typewriting and Arithmetic. Two forty minute periods
were spent on Shorthand each day by both groups. Tests were
given throughout the school year, under the direction of Mr.
Robert Straight of the Vancouver Bureau of Measurements.
These tests were to serve as a basis for comparison between
the two groups. A full description of these tests and the
results will be given in the next chapter.

It will be observed that the number of students tak­
ing the tests varies. At the beginning of the experiment
there were three classes under observation—one Gregg class and
two Pitman classes, each consisting of approximately forty
students. In accordance with the organization of classes in
the school, students taking Pitman Shorthand who ranked "D" or
"E" (the lower 25% of the group) on the Christmas examinations,
were moved into regularly enrolled classes as they were not
making sufficient progress to warrant their continuance in a
"special" class (1). The "D" and "E" ranking students in the
Gregg class had to remain in the original class as there were
no regular classes taking this system of shorthand. The de­
crease in the number of students in the Gregg class at the end
of the experiment is due to the policy of the school in recom­
mending the best students for positions at the end of the term.
This affected the Gregg class very seriously as they reached a

(1) A "special" class in the Fairview High School of Commerce
refers to a class of students who have had two years of
general academic training and are now taking a strictly
vocational course in Shorthand, Typewriting, Bookkeeping
and Business English.
dictation speed, satisfactory for business purposes, much sooner than the Pitman classes. Had it been possible to keep the same numbers throughout the experiment, the results would have been more favorable to the Gregg students, since, in the case of the Gregg class the best students found positions in business before the final tests of the experiment, while the weaker students in the Pitman class were dropped from the experimental group because they were unable to carry the work of a "special" class.
CHAPTER II.
The Detailed Results.

Test One.

The first test was given on October 1, after the students had one month of instruction. It consisted of a list of one hundred words from a shorthand vocabulary, equally favorable and common to both groups (1). The list was dictated at the same rate for both groups and the results were based on the transcription. Marks of the Gregg group ranged from 25% to 100% with a group median of 77.5%. The marks of the Pitman group ranged from 5% to 95% with a median mark of 51%. Detailed results were as follows:

<table>
<thead>
<tr>
<th>Score</th>
<th>Gregg</th>
<th>Pitman</th>
<th>Score</th>
<th>Gregg</th>
<th>Pitman</th>
</tr>
</thead>
<tbody>
<tr>
<td>95-100</td>
<td>1</td>
<td>0</td>
<td>45-49</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>90-94</td>
<td>8</td>
<td>1</td>
<td>40-44</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>85-80</td>
<td>2</td>
<td>4</td>
<td>35-39</td>
<td>0</td>
<td>9</td>
</tr>
<tr>
<td>80-84</td>
<td>3</td>
<td>3</td>
<td>30-34</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>75-79</td>
<td>2</td>
<td>4</td>
<td>25-29</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>70-74</td>
<td>4</td>
<td>6</td>
<td>20-24</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>65-69</td>
<td>3</td>
<td>3</td>
<td>15-19</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>60-64</td>
<td>6</td>
<td>4</td>
<td>10-14</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>55-59</td>
<td>1</td>
<td>6</td>
<td>5-9</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>50-54</td>
<td>2</td>
<td>0</td>
<td>0-4</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

(1) See appendix for list.
Test Two.

This test was given after two months' instruction. It consisted of a list of one hundred words from a shorthand vocabulary common to both groups. The list was dictated at the same rate for both groups and the results were based on the transcription. The marks of the Gregg group ranged from 30% to 100% with a median of 71.6%. The marks of the Pitman group ranged from 5% to 70% with a median mark of 31.5%. The detailed results were:

<table>
<thead>
<tr>
<th>Score</th>
<th>Gregg</th>
<th>Pitman</th>
</tr>
</thead>
<tbody>
<tr>
<td>95-100</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>90-94</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>85-89</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>80-84</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>75-79</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>70-74</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>65-69</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>60-64</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>55-59</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>50-54</td>
<td>0</td>
<td>6</td>
</tr>
</tbody>
</table>

Test Three.

This test was given after three months' instruction and again consisted of a list of one hundred words dictated at a common rate and taken from a vocabulary common to both groups. The results were based on the transcription. The
marks of the Gregg group ranged between 60% and 100% with a class median of 98.25%. The marks of the Pitman group ranged from 15% to 100% with a median of 63.25%. The detailed results were:

<table>
<thead>
<tr>
<th>Score</th>
<th>Gregg</th>
<th>Pitman</th>
<th>Gregg</th>
<th>Pitman</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>10</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>95-99</td>
<td>20</td>
<td>4</td>
<td>45-49</td>
<td>0</td>
</tr>
<tr>
<td>90-94</td>
<td>1</td>
<td>6</td>
<td>40-44</td>
<td>0</td>
</tr>
<tr>
<td>85-89</td>
<td>0</td>
<td>5</td>
<td>35-39</td>
<td>0</td>
</tr>
<tr>
<td>80-85</td>
<td>2</td>
<td>3</td>
<td>30-34</td>
<td>0</td>
</tr>
<tr>
<td>75-79</td>
<td>0</td>
<td>3</td>
<td>25-29</td>
<td>0</td>
</tr>
<tr>
<td>70-75</td>
<td>0</td>
<td>4</td>
<td>20-24</td>
<td>0</td>
</tr>
<tr>
<td>65-69</td>
<td>0</td>
<td>8</td>
<td>15-19</td>
<td>0</td>
</tr>
<tr>
<td>60-64</td>
<td>1</td>
<td>10</td>
<td>10-14</td>
<td>0</td>
</tr>
<tr>
<td>55-59</td>
<td>0</td>
<td>6</td>
<td>5-9</td>
<td>0</td>
</tr>
<tr>
<td>50-54</td>
<td>0</td>
<td>2</td>
<td>0-4</td>
<td>0</td>
</tr>
</tbody>
</table>

Test Four.

This test was given in April after about six months' training. It consisted of an article, with a shorthand vocabulary common to both groups, dictated at sixty words a minute for a period of five minutes. The results were based on the transcription. The marks of the Gregg group ranged from 55% to 100% with a median of 85.96%. The marks of the Pitman group ranged from 15% to 90% with a median of 56.1%.
Detailed results were as follows:

<table>
<thead>
<tr>
<th>Score</th>
<th>Gregg</th>
<th>Pitman</th>
<th>Score</th>
<th>Gregg</th>
<th>Pitman</th>
</tr>
</thead>
<tbody>
<tr>
<td>100-95</td>
<td>4</td>
<td>0</td>
<td>45-49</td>
<td>0</td>
<td>13</td>
</tr>
<tr>
<td>90-94</td>
<td>4</td>
<td>0</td>
<td>40-44</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>85-89</td>
<td>13</td>
<td>3</td>
<td>35-39</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>80-84</td>
<td>7</td>
<td>0</td>
<td>30-34</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>75-79</td>
<td>4</td>
<td>5</td>
<td>25-29</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>70-74</td>
<td>3</td>
<td>9</td>
<td>20-24</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>65-69</td>
<td>0</td>
<td>5</td>
<td>15-19</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>60-64</td>
<td>1</td>
<td>6</td>
<td>10-14</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>55-59</td>
<td>1</td>
<td>4</td>
<td>5-9</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>50-54</td>
<td>0</td>
<td>6</td>
<td>0-4</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
Test Five.

This test consists of a passage in longhand, with a shorthand vocabulary common to both groups, dictated at a rate of 70 words a minute for a period of five minutes. The results were based on the transcription. The gregg group ranged from 50% to 100% with a median of 73.1%. The Pitman class ranged from 10% to 65% with a median of 40.7%. Detailed results were:

<table>
<thead>
<tr>
<th>Score</th>
<th>Gregg</th>
<th>Pitman</th>
<th>Score</th>
<th>Gregg</th>
<th>Pitman</th>
</tr>
</thead>
<tbody>
<tr>
<td>95-100</td>
<td>3</td>
<td>0</td>
<td>45-49</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>90-94</td>
<td>0</td>
<td>0</td>
<td>40-44</td>
<td>0</td>
<td>11</td>
</tr>
<tr>
<td>85-89</td>
<td>1</td>
<td>0</td>
<td>35-39</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>80-84</td>
<td>8</td>
<td>0</td>
<td>30-34</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>75-79</td>
<td>1</td>
<td>0</td>
<td>25-29</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>70-74</td>
<td>8</td>
<td>0</td>
<td>20-24</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>65-69</td>
<td>3</td>
<td>1</td>
<td>15-19</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>60-64</td>
<td>5</td>
<td>3</td>
<td>10-14</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>55-59</td>
<td>2</td>
<td>4</td>
<td>5-9</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>50-54</td>
<td>1</td>
<td>6</td>
<td>0-4</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
Test Six.

This test consisted of a passage, with a shorthand vocabulary common to both groups, dictated at a rate of 80 words a minute for a period of five minutes. The transcription was considered in getting the results. The Gregg group ranged from 60% to 100% with a median of 79.1%. The Pitman class ranged from 15% to 85% with a median of 58%. Detailed results were:

<table>
<thead>
<tr>
<th>Score</th>
<th>Gregg</th>
<th>Pitman</th>
<th>Score</th>
<th>Gregg</th>
<th>Pitman</th>
</tr>
</thead>
<tbody>
<tr>
<td>95-100</td>
<td>3</td>
<td>0</td>
<td>45-49</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>90-94</td>
<td>3</td>
<td>0</td>
<td>40-44</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>85-89</td>
<td>5</td>
<td>1</td>
<td>35-39</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>80-84</td>
<td>4</td>
<td>1</td>
<td>30-34</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>75-79</td>
<td>6</td>
<td>1</td>
<td>25-29</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>70-74</td>
<td>4</td>
<td>6</td>
<td>20-24</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>65-69</td>
<td>6</td>
<td>6</td>
<td>15-19</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>60-64</td>
<td>1</td>
<td>5</td>
<td>10-14</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>55-59</td>
<td>0</td>
<td>9</td>
<td>5-9</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>50-54</td>
<td>0</td>
<td>3</td>
<td>0-4</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
Test Seven.

This test was a passage dictated at 100 words per minute for a period of five minutes. The results were based on the transcription. The marks of the Gregg group ranged from 55% to 95% with a median of 76.87%. The Pitman group ranged from 20% to 90% with a median of 61%. Detailed results were:

<table>
<thead>
<tr>
<th>Score</th>
<th>Gregg</th>
<th>Pitman</th>
<th>Score</th>
<th>Gregg</th>
<th>Pitman</th>
</tr>
</thead>
<tbody>
<tr>
<td>95-100</td>
<td>0</td>
<td>0</td>
<td>45-49</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>90-94</td>
<td>2</td>
<td>0</td>
<td>40-44</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>85-89</td>
<td>1</td>
<td>1</td>
<td>35-39</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>80-84</td>
<td>7</td>
<td>2</td>
<td>30-34</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>75-79</td>
<td>4</td>
<td>5</td>
<td>25-29</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>70-74</td>
<td>4</td>
<td>6</td>
<td>20-24</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>65-69</td>
<td>4</td>
<td>7</td>
<td>15-19</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>60-64</td>
<td>2</td>
<td>5</td>
<td>10-14</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>55-59</td>
<td>1</td>
<td>4</td>
<td>5-9</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>50-54</td>
<td>0</td>
<td>4</td>
<td>0-4</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
Test Eight.

This was the final examination conducted by the Department of Education, Victoria, B.C. It consisted of three passages, dictated at 80, 100 and 120 words per minute. It represented the final test in the series. All members of the Gregg class who had not obtained business positions wrote this test, while only the students of the Pitman class who had obtained a mark of 55% or better in Test 7, wrote this final examination (1). This explains the small number of students who took part in this test. Transcription, only, was marked. The range of marks for the Gregg group was from 50% to 100% with a median of 82.5%. The range of the Pitman group was from 5% to 85% with a median of 57.9%. Detailed results were:

<table>
<thead>
<tr>
<th>Score</th>
<th>Gregg</th>
<th>Pitman</th>
<th>Score</th>
<th>Gregg</th>
<th>Pitman</th>
</tr>
</thead>
<tbody>
<tr>
<td>95-100</td>
<td>3</td>
<td>0</td>
<td>45-49</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>90-94</td>
<td>3</td>
<td>0</td>
<td>40-44</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>85-89</td>
<td>0</td>
<td>0</td>
<td>35-39</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>80-84</td>
<td>7</td>
<td>2</td>
<td>30-34</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>75-79</td>
<td>2</td>
<td>2</td>
<td>25-29</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>70-74</td>
<td>1</td>
<td>4</td>
<td>20-24</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>65-69</td>
<td>1</td>
<td>2</td>
<td>15-19</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>60-64</td>
<td>1</td>
<td>1</td>
<td>10-14</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>55-59</td>
<td>0</td>
<td>6</td>
<td>5-9</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>50-54</td>
<td>1</td>
<td>6</td>
<td>0-4</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

(1) A fee of $5.00 was charged by the Department of Education to write this examination. Students who had very little chance of meeting the requirements were advised not to write.
CHAPTER III.

The Evolution of Shorthand Principles.

As the result of the experiment, the writer became interested in a historical study of shorthand systems. Why had the results from the Gregg class been superior to those of the Pitman class? Only a careful study of the underlying principles of shorthand writing can answer that question satisfactorily. A brief survey of the steps in the evolution of shorthand writing will be considered before analysing the results of this experimental study.

The first important principle in the growth of shorthand systems was the derivation of the characters of the Tironian \(^{(1)}\) notes from the majuscules or capital letters of the Latin writing of that time. The minuscules, or small letters that could be joined and which were written in one direction—our current running hand—did not come into general use until the ninth century. As the majuscules of Latin are drawn in all directions, for example V, A, T, the shorthand characters derived from them were written in all directions—back slope, forward slope and vertical.

---

\(^{(1)}\) Tiro was a Greek slave, belonging to Cicero, the Roman statesman and orator. He invented a system of shorthand notes which he used in recording the orations of his master.
The second step was the imitation of the Tironian notes by the early English authors, and, consequently, the adoption of the majuscule basis, which imposed upon the art of shorthand the multi-sloped style of shorthand writing.

The third step was the very evident progress, through a series of early English systems, toward the expression of each letter in the alphabet by a single character (2). This is probably the most clearly defined step of any (3).

(2) The first alphabetic system, that of John Willis (1602), contained no less than nineteen compound forms for the twenty-six letters represented in the alphabet of that system.

(3) An interesting illustration is the evolution of "f" and "v". In the Tironian "notae", the letter "v" was expressed by two strokes—a back-slope stroke and a forward upstroke, in imitation of the Latin capital V. Beginning with John Willis (1602), the compound sign used by Tiro for "v" was adopted by E. Willis, (1618), Witt, (1630), Dix, (1633), Mawd, (1635), Shelton, (1641), and more than a score of other authors of early English systems and continued in use for that very purpose and in that very form, down to and including the noted system of James Weston, published in 1727.
The fourth important principle was the gradual acceptance of the principle of writing by sound and the provision of characters that rendered it possible to express the phonetic alphabet (4). As the alphabets of the early English systems were not arranged on a phonetic basis, since they provided a character for "c" (which is sounded as "k" or "s") and did not provide characters for such simple sounds as "sh, th, ch," it was impossible to carry out the directions to write words according to their sound. Most of the early authors recognized this and contented themselves with directing the student to omit silent letters. It was not until the end of the eighteenth and the beginning of the nineteenth centuries that the negative statement of the principle (omit silent letters) was changed to the positive statement—write by sound. Characters were provided which enabled the principle to be carried into effect (5).

(4) The author of the first system of alphabetic shorthand, John Willis, said: "It is to be observed that this art prescribeth the writing of words, not according to the orthography as they are written, but according to their sound as they are pronounced."

(5) Holdsworth and Aldridge, (1766), Phineas Bailey, (1831), Pitman, (1837).
The fifth step was the arrangement of the consonant characters according to their phonetic relationship, "p, b; t, d; ch, j; k, g." (6).

The sixth step was the founding of the characters of the alphabet partly upon modern longhand forms instead of upon the ancient Roman capitals. Even the alphabet of John Willis (1602) took a hesitating step in this direction in the expression of "y" by a character that imitated the small "y" of current writing. Other authors extended the use of cursive characters to "r, h," and some other letters (7). That forward-running characters were more facile than back-slope characters was recognized early in the history of modern shorthand. This is shown by the fact that characters on the forward slope of writing, or with an onward movement, were given the preference in the representation of frequently occurring letters (8).

The seventh step was towards the joining of vowels and consonants in the natural order in which they occur in a word. The expression of vowels by strokes in the earlier systems was so awkward, that, in seeking relief from the burden of their

(6) Holdsworth and Aldridge, Byrom, Pitman and others.

(7) Richard Roe, (1802), Thomas Oxley, (1816).

(8) One of the most noted and talented of shorthand authors, John Byrom, said: "The other "th" (a back-slope character) by reason of our customary method of leaning the letters the contrary way in common writing, is not so readily made."
expression, it is not surprising that some of the early shorthand authors (Samuel Taylor, for example) went to the other extreme of expressing any vowel by a dot. Others attempted to give a more definite expression by placing dots, commas, or dashes in various positions alongside the consonants. In practice most of the vowels were left out.

The eighth step was in the direction of the use of characters of one thickness. The difficulty of finding material to express the letters without resorting to compound forms suggested the use of characters of varying degrees of thickness. When shading was first introduced, it was in harmony with the style of longhand writing then in vogue, as may be seen from the specimens of longhand writing of that period. But the demand for rapidity in more modern times has put the ornate shaded style of writing in the discard.

The final step is the most recent of all and it has not yet received the attention and appreciation that it will probably receive in the near future. It is the principle of writing with a curvilinear motion as opposed to the angular style of writing. More will be said of this principle in the next chapter.
CHAPTER IV.

The Basic Principles of a Good Shorthand System.

Thomas Anderson, who was for many years a reporter in the Law Courts of Glasgow (and a writer of Pitman Shorthand) and who wrote a very valuable and scholarly "History of Shorthand", sets forth the following axioms as a sound basis for a shorthand system. They are:

1. The alphabet of a good shorthand system must include independent characters for the vowels, which characters must be adapted for writing in union with the forms for the consonants. In other words every letter of the common alphabet must have a special and distinctive shorthand mark.

2. The characters of a good shorthand system must be all written on the one slope.

3. In a good shorthand system no distinction of letters made thick from letters made thin is admissible.

4. The rules of abbreviation in a good system of shorthand must be few, comprehensive and sure.

5. In a good shorthand system there must be only one line of writing (1).

For the purpose of this study, these "axioms" may be re-stated as seven basic principles, each of which will be considered in detail, as it applies to the two systems which were subject to the experiment. They are:

1. Longhand as a basis of shorthand.
2. Curvilinear motion.
3. Elimination of obtuse angles by natural blending of lines.
4. Joined vowels.
5. One thickness—elimination of shading.
6. One position—elimination of "position writing".
7. Lineality—the easy, continuous flow of the writing along the line.

An examination of each of these principles is now given:

1. **Longhand as a Basis of Shorthand:**

   Shorthand characters may be based on the circle and its segments (for example, Pitman) or they may be based on the ellipse or oval (for example, Gregg). As Pitman Shorthand is based on the circle, its characters are supposed to be drawn with geometric precision and are struck in all directions, necessitating continual change in the position
of the hand while writing (1).

As Gregg Shorthand is based on the ellipse or oval, it is written with a uniform slope as in longhand. Its characters are, therefore, familiar and natural to the hand and like longhand do not require a change in the position of the hand while writing. "With a uniform slope as in longhand" does not mean any particular slope, but that the writing is uniform in slope.

Isaac Pitman, in the seventh edition of his manual said:

"The student should be careful not to hold the pen as for common writing, for this position of the hand is adapted for the formation of letters constructed upon a totally different principle from those of Phonography. The pen should be held loosely in the hand, like a pencil for drawing, with nib turned in such a manner that the letter "k" can be struck with ease."

Andrew Graham, author of the most successful American modification of Pitman's Shorthand, in the introduction to Part Two of his "Standard Phonography", said:

(1) In a series of articles on "Aids and Hindrances to Shorthand Writing" in Pitman's Shorthand Weekly, Alfred Kingston said: "I have frequently noticed that the shorthand student skilled in drawing always makes the best start upon the shorthand alphabet. The student should be encouraged, therefore, to treat the preliminary work of mastering the simple geometric forms and especially the curves, as something really in the nature of a drawing lesson and to draw them as carefully and accurately as possible at the start."
"The position given to the pen and hand in back-hand writing seems best adapted for the easy and graceful formation of phonographic characters. The pen should be held very loosely, so that the nib may be readily turned and suited to the execution of characters made in various directions."

David Wolfe Brown, for many years one of the staff of official reporters of the House of Representatives, Washington, in his book "The Factors of Shorthand Speed", declares:

"In the shorthand writer's manual of discipline the first step is to get rid of certain habits often acquired in longhand, and which, unless corrected, must make high stenographic speed a physical impossibility. It may be desirable, for a time at least, that longhand practice be, as far as possible, suspended, so that a new set of manual habits may be the more easily acquired."

"One of the habits which shorthand writers need especially to overcome arises from the peculiar slant of the longhand characters.......as the shorthand characters are written in almost every direction--probably more of them with a backward inclination, or with a horizontal motion, than with a forward slope--the hand and fingers, in being educated for shorthand writing, must be emancipated from the fixed position to which they have been accustomed in longhand."

From these quotations it will be seen that, instead of previous experience and training in the writing of longhand being regarded as an advantage to the student of Pitman Short-hand, it is declared by these Pitman authorities to be an obstacle. In the Pitman system the student has to learn new habits of writing and to get rid of certain habits acquired in longhand. In Gregg Shorthand he carries over habits already established. This may be a very fundamental reason why in the experimental classes the Gregg system proved easier to
learn and write by the students.

If it be true that the movements and characters used for longhand writing have been adopted because they are easy and natural to the hand, we believe that it does not require argument to prove that the same easy, natural movements and characters are the logical basis of a briefer style of writing. Indeed, nearly all authors and expert writers of geometric systems have been willing to acknowledge this, but have asserted that, on account of the limited shorthand material, it was impossible to construct a practical system on such a basis.

At the first International Shorthand Congress, in 1887, Professor J.D. Everett, author of "Everett's Shorthand for General Use", a geometric system, acknowledged that, "to employ characters which slope all one way is advantageous insofar as it enables the writer to make a given number of movements in a given time".

The famous journalist, editor, author, and Member of Parliament, Mr. T.P. O'Connor, in writing on the subject of shorthand in the Weekly Sun, London, said:

"I am not an entire believer in the Pitman system of shorthand; but as I began with it I never tried to change------I have known very few Pitman writers whose notes could be read by anybody else, and I have known a great many--including myself--who found it very difficult to read their own notes.

"It strikes me now, that the system is best which can be made most like the ordinary longhand. Obviously the same muscles, the same nerves, the same attitudes, all that conglomeration of causes, open and latent, which provide the peculiarities of one's longhand will be employed in producing the shorthand. In other words one will write his shorthand as he does his longhand."
In an article on "The 'One Slope' Theory in Shorthand", Mr. G.C. Mares stated the practical advantages obtained from uniformity of slope in a very convincing way:

"It will be evident to the vast majority of shorthand writers that in Pitman Shorthand many words can be written much faster than others, even though the number of pen strokes and its ineffective movements (lifts) are the same. Thus the word cherry can be written faster than pity; reject is more facile than shave, although it has an additional stroke, and the same may be said of hundreds of other words. What causes the difference in facility? The answer is that cherry, reject, are written on the 'one slope' whilst pity, shave, employ back strokes. At the commencement, then, we see that an advantage exists in favor of one-slope writing; but no one has yet, I believe, shown the existence of this advantage. I will, therefore, invite attention to the following figures:

(a) A rapid penman can write 30 words a minute, each word containing on an average of 16 movements—16 x 30 equals 480 longhand strokes a minute.

(b) The limit of the power of the hand to form shorthand strokes, is, at the outside figure, 300 a minute; 300 to 480 shows 60% in favor of longhand strokes.

(c) As the formation of shorthand strokes requires more care than longhand, on account of the necessary observance of length, thickness, etc., an allowance of, say 25 per cent must be made, and this, with an allowance of 10 per cent for loss of brevity (if any) as compared with other systems, will leave us 25 per cent advantage in the matter of facility of execution gained by the use of one-sloped or longhand signs or strokes."

Other features of longhand writing are:

(a) There is no compulsory shading or thickening of the characters.

(b) Words are not placed in several positions with relation to the line of writing.

(c) All the letters, vowels and consonants are joined.
All these features are found in the Gregg system of shorthand.

2. **Curvilinear Motion:**

Many authorities on handwriting agree that a stiff, angular style of longhand writing always connotes a slow writing, and that an easy, rapid, effortless style of writing abounds in curves, because curves are written with a free, rolling, continuous motion (1). The muscles are relaxed in making elliptical curves. Straight lines necessitate greater rigidity of hand (2). If this be true of longhand, it must be equally true of shorthand. Gregg Shorthand is based on the ellipse or oval, and this is the vital distinction between it and Pitman Shorthand which is founded on the circle and its segments. This is the feature which distinguishes the Gregg system not only from the Pitman system but from all other

---

(1) Mr. Hugh B. Callendar, B.A., of Cambridge University, author of "Cursive Shorthand", states this very well when he says:

"It is commonly stated that straight lines are more facile than curves. This is true of a series of straight lines described independently; but the curve often has the advantage in the matter of joining to the other characters, for its curvature may generally be varied especially near the ends, so as to make the joining easier."

(2) Some very significant admissions about the value of curve motion occur in "Phonography in the Office" a book by Mr. Alfred Kingston, published by Isaac Pitman and Sons. He says:

"The increased friction from the resistance of the paper makes it a serious obstacle to the acquisition of speed, to say nothing of the difficulty of distinguishing thin and thick strokes."

Mr. Kingston then proceeds to give an exercise to be practised for the purpose of counteracting this heavy style:

"The exercise is so framed as to consist almost exclusively of light curves."
systems that claim to be founded on longhand or on the slope of longhand. Curves embody the natural motion of the hand in writing and so tend toward greater facility in writing, resulting in greater speed with less effort. In this connection the findings of The National Institute of Industrial Psychology (London) on the mental and physical qualities of operatives in factories is interesting:

"While the shortest distance between two points is a straight line, the investigators have found that curved movements of the hands, though longer than straight movements, may be quicker in the end—-Workers were trained by the investigators to follow elliptical paths and natural rhythms instead of straight lines, and an increase of thirty per cent output was obtained, far less effort resulting."

3. Blended Consonants:

One of the great hindrances to rapid shorthand writing is the obtuse angle. A few quotations from well known shorthand authorities will support this statement. In the preface to Munson's Shorthand Dictionary, written by the author of a popular system of shorthand, the following appears:

"Too frequent obtuse angles between stems—a very great impediment to speed, as may be readily demonstrated by tracing with exactness, but as quickly as possible, a line like the first of the following diagrams, and then in like manner, one like the second."

Mr. Munson then gives two lines of outlines, one with sharp, and the other with obtuse angles. He adds:

"It will be seen that the outline with obtuse or blunt angles requires a much slower movement than the one with sharp angles."

The famous reporter, and foremost exponent of Isaac Pitman Shorthand in England, Thomas Allen Reed, in "Leaves
The easiest joinings are those of straight lines or curves that run into one another. Right angles and obtuse angles are less easy. Unless the junction is easy and flowing, no time is saved; indeed it will often take less time to write such words separately than without lifting the pen.

Pitman Shorthand is full of angles where Gregg arranges the horizontal and upward lines that, when they blend in the form of curves, these curves represent very frequent combinations of sounds.

4. **Joined Vowels:**

Joined vowels have been used in shorthand since the first systems were invented. The Tironian Notes, which were used in reporting the orations of Cicero, employed joined-vowel signs, as did nearly all the early English systems. In a discussion before the Shorthand Society, London, in 1883, the famous reporter, Thomas Allen Reed, an authority on Pitman's Shorthand, has this to say:

"The advantage of joined vowels is no doubt very great. If a good system could be constructed in which the vowels and consonants could be all joined continuously, and, at the same time, the system could be as brief, as other systems without vowels are, such a system would be a desideratum we should all hail with delight."

The Gregg System has proved to be such a system with its joined vowels. The unscientific and illogical nature of disjoined vowels as used by Pitman has been pointed out by the great English scientist and philosopher, Herbert Spencer:
"The vowels are not sufficiently distinguishable. The sounds "e, a, ah" are indicated by dots, and "ou, o, oo" by small dashes; and it is hardly expected that in rapid writing these marks can be made with such accuracy as to insure their identification. Moreover, the distinction between the individual vowels, dependent as it is upon the placing of the dot or dash at the beginning, middle, or end of a consonant is such as cannot be observed with certainty. And, further, the greater heaviness of touch by which the long vowels are known from the short ones can never be given with anything like precision without an amount of care inconsistent with expedition--------.

"Phonography looks simple in consequence of these movements having no representations upon paper, whilst in reality they require an equal amount of time with those that leave visible signs behind them. Nay, more: to lift the point of a pencil from the paper and carry it over the surface to make a dot at some other place, involves a more complicated muscular action than its transference to the same point along the surface (that is, without leaving the paper), and probably more time is expended in the motion."

The initial difficulty which the student encounters in separating vowels and consonants is well-known to all teachers of shorthand. If the student takes up Pitman, he is taught to make outlines of the consonant characters and omit all silent letters and vowels, which may give him the same outlines for such words as "eastern, Saturn, Austrian, stern and strain". Since the student has for ten or fifteen years looked upon language as composed of consonants and vowel sounds, it will necessarily take him several months to learn to look at the language in this new way. While writing is difficult, the reading is still more difficult, and consequently the transcript is often faulty.

One of the most powerful presentations of the agree-
ments in favor of joined vowels was made by Mr. Hugh Callendar, B.A., Fellow of Trinity College, Cambridge, author of "Cursive Shorthand":

"In the disjoined vowel systems the consonant outline of each word is written first, and the vowels are dotted in afterwards in their proper places. This is called 'vocalizing' the outline. The writer has to go over each word twice, in a highly artificial and unnatural order, if he wants to put in the vowels, that is to say, if he wishes his writing to be legible.

"It is often maintained that a detached vowel mark counts in loss of time only about as much as an extra lifting of the pen. This is very far from true. In addition to the lifting of the pen there is the time occupied in making the stroke or dot and locating it carefully in its proper position. This is found to be longer than the time required for the mere making of the same number of dots and ticks irrespective of position. Besides this, detached vowels usually involve hesitation. After finishing the consonant outline the writer has to make up his mind what vowels to insert, and where; or whether he can leave the outline unvocalized. But the most serious hesitation generally occurs, and this even with the most skilful writers, after inserting the vowels and before proceeding to the next words. This is most strongly marked after inserting two or more vowels in one outline. It is probably due to the illogical order in which the vowels are written. The result is that the insertion of detached vowel marks involves such a disproportionate expenditure of time that they must be omitted when writing at any reasonable speed."

"The chief advantage of detached vowels is that they present an appearance of brevity, and look neat, especially in print. They are so inconspicuous that the inexperienced person does not realize the difficulty of inserting them accurately and takes no account of the aerial movements of the pen which their insertion involves."

5. **Shading:**

Pitman employs the shading principle, whereas Gregg uses a light line method. The "Phonographic Magazine", 
Cincinnati, Ohio, (the organ of the Ben Pitman system) for May, 1889, has this statement:

"Undoubtedly, there are many outlines which are recognizable from their general form without reference to shading—with the shading omitted, or even with the shaded and light strokes reversed. But such outlines are relatively few, and are only the forms of long words or of highly characteristic phrases. Thousands of words and phrases of only one and two strokes depend upon correct shading not only for ready legibility, but for a degree of legibility which enables the writer to read them at all."

Some years ago a well-known Chicago law reporter, Mr. W.E. McDermut, in writing on the subject of shading, said:

"Forty years ago Mr. Graham tabulated the results of experiments made to test the relative brevity of certain characters and combinations. His tables showed that light characters are at least ten percent more rapid than heavy ones. I have demonstrated with shorthand classes that this is the minimum difference and some writers claim that the advantage of light strokes amounts to thirty percent."

In the preface to the "Modern Stenographer", Mr. George H. Thornton, former president of the New York State Stenographers Association and official reporter of the Supreme Court, New York, said:

"It has finally become the experience of the most expert stenographers that outlines which depend upon shading for their legibility are in general unsafe outlines to adopt.-------If, as experience has taught, this shading of the outlines can be done away with, it is useless to tell a practical stenographer of the immense advantage in point of speed to be gained thereby--------. The essence of this principle is recognized by Mr. Munson in his "Complete Stenographer", for he says that increase of speed is attended with decrease of force, and therefore that all stems would be written as light as consistent with legibility. If this is true, the converse of the proposition most naturally follows, that the increase of force necessarily required in the shading of the outlines
"must be attended with decrease of speed. It is so apparent that a plain system can be written with a greatly increased rapidity that it is hardly worth while to demonstrate it."

A pamphlet on behalf of Sloan-Duployan Shorthand, entitled "Revolution in Shorthand" (written and copyrighted by Mr. Thomas S. Malone, then the Glasgow agent for Sloan-Duployan and who later became identified with "Script Phonography") claims that one of "the leading principles of structure from which the system derives its chief excellence is the absence of shading, or the use of light and heavy signs, which is only introduced by Mr. Sloan into his adaptation to meet a peculiarity of the English language with regard to one particular letter of constant recurrence". Then follows this succinct statement of the evils of shading:

"The extensive use of the process of shading outlines, although very general in the old systems, is a most objectionable principle in shorthand, being an obstruction of speed, if used, and a source of illegibility, if neglected."

6. Position Writing:

The expedient of writing words in several different positions in relation to the line of writing is a very old one, and one that has been used for almost every conceivable purpose. It has been used for doubling letters, for indicating omission of vowels or consonants and as a means of distinction between word forms.

It is not generally known that Isaac Pitman rejected position-writing in the first editions of his system and condemned it unsparingly. Writing about some of the earlier
"Systems of shorthand that depend for their existence upon staves, like music, or even on a single line on which the letters have a three-fold power of expressing different words above, on, or below the line are certainly practicable, but they are not practical."

But as time went on Pitman found that, on account of the omission of vowels in his system in practical writing, many words containing the same consonants but different vowels, were misread. He, therefore, reluctantly introduced position-writing.

In a discussion at a meeting of the Manchester District of the Incorporated Society of Shorthand Teachers, Mr. Sandiford, a well-known and accomplished teacher of Pitman's Shorthand, said:

"Mr. Hallam has dwelt on the point that vocalization in Pitman is now much less scientific than it used to be, that it is more difficult than ever to decipher a word, that more is thrown upon position-writing than ever before, and that position-writing in itself is one of the most dangerous expedients you can possibly have in any system of shorthand."

"That is my conclusion, too. It is, it seems to me, a mistake on the part of the Pitmanites to labor the question of the positional representation of vowels. After all, position tells you neither what the vowel is, where it is, in what part of the word it occurs, whether it is before a consonant or after a consonant, nor supposing it is, say, a first-place vowel, which particular first-place vowel or diphthong it is. In point of fact, if you try to decipher an outline apart from content, you may have to run through a dozen words before you hit upon the correct one."

Mr. David Wolfe Brown, in his book, "The Factors of Shorthand Speed", in detailing the difficulties which students encounter, said:
"If thus unskilled as to the requirements of the reporting style, he must not only think out the whole outline before starting to write it, but with the outline mentally suspended, must decide which of perhaps half-a-dozen vowels (heard possibly none too distinctly) is the one which should determine the 'reporting position' of the outline. I ask them to write some word, not very difficult, but which they have never written before and they hesitate painfully. The pen seems unwilling or unable to touch the paper. Mind and hand appear paralyzed. 'What boggles you?' I ask; and they reply, 'Oh, I can write the outline but I am trying to think of the position!' This is often their pitiable plight after they have been writing shorthand for months and months!"

There is mental effort in thinking ahead about the position in which words should be placed. There is physical effort in dodging from one position to another, instead of proceeding continuously along the line of writing. Not only is position-writing a tax on the memory and a constant source of hesitation, but the changing of the position of the hand in placing the words, now above, now below, now on the line, interferes with both speed and legibility.

7. Lineality:

Lineality in shorthand writing is understood to mean writing that keeps to the line instead of running in a downward or in an upward direction. It is obvious that if the writing descends below the line of writing or shoots upward, there is an ineffectual movement in getting back to the line. The great English philosopher, Herbert Spencer, in discussing shorthand systems, described such ineffectual efforts as the "unregistered movements of the pen".

In comparing shorthand systems, the importance of
lineality—the continuous movement of the hand along the line—is too often overlooked and yet it is a factor of paramount importance. When properly understood, this matter of lineality makes clear some otherwise inexplicable events in shorthand history. We constantly see references to the extraordinary vitality of the systems of Gurney and Taylor—the former having been in existence nearly two centuries and the latter more than a century. The explanation of the longevity of these old systems is to be found in the fact that they are free from shading and position-writing; consequently, the authors were able to select lineal, easy characters for the most frequent letters. The writing although lengthy, is more like a free, onward running script—and therefore rapid.

In his keen analytical criticism of Pitman's Shorthand, Herbert Spencer said, among other things:

"It does not keep to the line. This is an evil common to all shorthand hitherto published—an evil productive not only of inelegance, but of great inconvenience, and one which must seriously militate against the general adoption of any method of writing which does not avoid it."

David Wolfe Brown, in commenting on Mr. Spencer's views, said:

"Whatever else we may think of Herbert Spencer as a shorthand critic, there is at least one of his remarks that should give us food for serious reflection. It is undoubtedly true that 'the unregistered movements'—those in which the pen or pencil moves over the paper without touching it—consume an equal amount of time with similar movements that leave visible signs behind them. This being true, one of the most obvious of shorthand lessons is to spend as little time as possible in 'unregistered movements'—in executing unwritten strokes—in writing 'in the air'."
Among the suggestions made by Mr. Brown for reducing "the unwritten stroke" to a minimum, is this:

"By avoiding all unnecessary carrying of the pen or pencil above or below the normal line of writing."

In a series of scholarly and highly-analytic articles on "The Art of Phrasing", which were published in "The Stenographer and Phonographic World" in 1919, Professor A.H. Codington (a Pitman writer) discussed the subject of lineality as follows:

"The easiest natural method of writing is upon or close to the line. As only two to four vertical or sloping stroke-lengths can occupy the space between two lines of writing (depending upon the shorthand system and the size of the writer's notes) any ascent or descent of more than two or two-and-a-half strokes below or above the line of writing is likely to interfere with the writing on the line above or below. Long ascents or descents cramp the hand and impair speed and legibility. Lineality avoids the intermixing of outlines and the delays in dodging outlines which ascend or descend too far, and should control good phrasing. The superior lineality of Gregg Shorthand to that of Pitmanic and others, through its horizontals, slopes, and lack of downward perpendiculars and its consequent adaptability to easy, sweeping phrases along the line of writing, is one of its strongest points."

The Committee on Shorthand Standards of the New York State Shorthand Reporters' Association has declared that:

"Assignment of signs to sounds should give a factor of horizontal lineality of not less than 75%. This factor of lineality varies for well-known shorthand systems from just under 50% for most Pitmanic systems to just over 90% for Gregg."
CHAPTER V.

Conclusion.

The first chapter of this thesis has described the experiment which was carried on at the Fairview High School of Commerce for the purpose of seeing which system of shorthand, Gregg or Pitman, gave the better results. It was noted that the experiment was conducted with groups of students who were specializing in the vocational aspect of the commercial course and not with students enrolled in the regular four year high school course. The two groups were approximately equal in intelligence and previous academic training. Both took the same course, spending two periods of forty minutes each day on the study of shorthand.

In the second chapter the detailed results of each test were presented. In every test the Gregg group proved its superiority. These results have also been set up in graphic form and will be found in the appendix of this thesis.

A brief history of the evolution of shorthand principles was then outlined. No attempt was made to catalogue the names and works of the various shorthand authors, as is the case with most of the histories that have appeared in the past. This led to a discussion of some of the basic principles which the writer believes should be embodied in a good shorthand system. Many shorthand authorities were quoted in support of these principles. Most of the authorities quoted
were Pitman writers who recognized the weaknesses of the system which they were using. They agreed that a system which followed the principles of longhand writing was preferable to the system which they used (1). Some of these features were the use of characters which slope in one way, no shading or thickening of the characters, the joining of vowels and consonants and the placing of words in one position with relation to the line of writing.

Much space could be given to a more elaborate presentation of the principles of both Pitman and Gregg Shorthand. But the purpose of this study was to see which system gave the better results. The actual achievement of the group studying Gregg Shorthand has shown the soundness of the principles of this system. The fundamental difference between Pitman Shorthand and Gregg Shorthand is that, Pitman Shorthand is based on the circle and its segments and Gregg is based on the ellipse or oval. As Pitman Shorthand is based on the circle, its characters are supposed to be drawn with geometric precision (2) and are struck in all directions. The characters, being struck in all directions, necessitate continual change in the position of the hand while writing.

As Gregg Shorthand is based on the ellipse or oval, it is written with a uniform slope. This is in accordance

(1) See Chapter IV.

with the principles of the MacLean System of Handwriting which most of the students in this province (B.C.) study. The students who studied Gregg Shorthand found that the characters were familiar and natural to the hand. Those who studied Pitman Shorthand had to learn new habits of writing. The student or writer of a system founded on a system of long-hand writing, as Gregg, requiring the same position of hand and fingers, and the same movements as longhand, starts on the study with an initial advantage over the student who has to change from writing habits already established. The writer believes that this explains in a large measure the superior results of the Gregg group. In addition, the Gregg system incorporates the basic principles which have been discussed. The following quotation from the "Story of Gregg Shorthand" gives a concise repetition of these principles:

"I regard the alphabet as a natural evolution of the best principles of all systems mentioned. In its making, therefore, credit is due to the great shorthand authors of the past, whose genius cleared the path for progress. The chief distinction I claim for Gregg Shorthand is that while other systems embody one or more natural principles—such as absence of shading or position of writing, or uniform slant, or lineal, continuous movement, or connective vowels—Gregg Shorthand is the only system embodying all these natural features."
APPENDIX A.
Supplementary Observations.

During the course of the experiment, in addition to the tests conducted by the Bureau of Measurements, an accurate record of the speed certificates won by the Gregg class and the time it took to attain the various speeds, was kept by the writer. These are presented below. Each dictation test was five minutes and the transcription had to have less than two per cent of error.

(a) In March after six months' training:

19 members of the class had received certificates for a speed of 60 words per minute.

4 members of the class had received certificates for a speed of 80 words per minute.

(b) In April after seven months' training:

29 members of the class had received certificates for a speed of 60 words per minute.

15 members of the class had received certificates for a speed of 80 words per minute.

2 members of the class had received certificates for a speed of 100 words per minute.

(c) In May after eight months' training:

31 members of the class had received certificates for a speed of 60 words per minute.

28 members of the class had received certificates for a speed of 80 words per minute.

9 members of the class had received certificates for a speed of 100 words per minute.
(d) In June after nine months' training:

- All members of the class had 60-word certificates.
- All members of the class had 80-word certificates.
- 14 members of the class had 100-word certificates.
- 3 members of the class had 125-word certificates.
APPENDIX B.
Copies of Final Tests.

TEST 1.

<table>
<thead>
<tr>
<th>bank</th>
<th>cash</th>
<th>check</th>
<th>money</th>
<th>youth</th>
<th>happy</th>
<th>bill</th>
<th>away</th>
<th>tenth</th>
<th>back</th>
<th>early</th>
<th>mail</th>
<th>envy</th>
<th>coach</th>
<th>shabby</th>
<th>keg</th>
<th>shed</th>
<th>month</th>
<th>judge</th>
<th>canoe</th>
<th>fetch</th>
<th>fish</th>
<th>Canada</th>
<th>party</th>
<th>vote</th>
</tr>
</thead>
<tbody>
<tr>
<td>pack</td>
<td>pocket</td>
<td>ledge</td>
<td>candy</td>
<td>dock</td>
<td>ready</td>
<td>hurry</td>
<td>baggage</td>
<td>penny</td>
<td>golf</td>
<td>share</td>
<td>reach</td>
<td>relay</td>
<td>pity</td>
<td>orb</td>
<td>web</td>
<td>tap</td>
<td>live</td>
<td>kill</td>
<td>gull</td>
<td>roam</td>
<td>bale</td>
<td>book</td>
<td>bit</td>
<td>leave</td>
</tr>
<tr>
<td>fear</td>
<td>show</td>
<td>page</td>
<td>may</td>
<td>cape</td>
<td>boat</td>
<td>pool</td>
<td>way</td>
<td>teach</td>
<td>cool</td>
<td>move</td>
<td>keep</td>
<td>fee</td>
<td>meek</td>
<td>tea</td>
<td>shore</td>
<td>shore</td>
<td>fair</td>
<td>coal</td>
<td>hawk</td>
<td>tare</td>
<td>rogue</td>
<td>folk</td>
<td>towed</td>
<td>bay</td>
</tr>
<tr>
<td>cube</td>
<td>lively</td>
<td>happy</td>
<td>sailing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------------</td>
<td>--------------</td>
<td>---------------</td>
<td>---------------</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>tile</td>
<td>affair</td>
<td>lame</td>
<td>sleep</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>boil</td>
<td>allow</td>
<td>shabby</td>
<td>rejoice</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>dial</td>
<td>tenth</td>
<td>tube</td>
<td>exciting</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>rout</td>
<td>assume</td>
<td>wrong</td>
<td>sixty</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>loyalty</td>
<td>authority</td>
<td>fish</td>
<td>seeming</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>towel</td>
<td>purity</td>
<td>long</td>
<td>muscle</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>item</td>
<td>rowdy</td>
<td>belonged</td>
<td>sneak</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>oiling</td>
<td>refuge</td>
<td>rod</td>
<td>sunk</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>argue</td>
<td>defy</td>
<td>cash</td>
<td>sings</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>now</td>
<td>power</td>
<td>length</td>
<td>desk</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>type</td>
<td>enemy</td>
<td>ring</td>
<td>raisin</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>alive</td>
<td>tunic</td>
<td>hotel</td>
<td>custom</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>deny</td>
<td>ready</td>
<td>farm</td>
<td>unsafe</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>enjoy</td>
<td>early</td>
<td>thief</td>
<td>hazel</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>review</td>
<td>out</td>
<td>took</td>
<td>casks</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>duly</td>
<td>big</td>
<td>avenue</td>
<td>wiser</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>loudly</td>
<td>likely</td>
<td>manage</td>
<td>facing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>occupy</td>
<td>easy</td>
<td>seat</td>
<td>spokes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>failure</td>
<td>nephew</td>
<td>suppose</td>
<td>speed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>wash</td>
<td>accuracy</td>
<td>series</td>
<td>solo</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>five</td>
<td>guarantee</td>
<td>race</td>
<td>self</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>enjoy</td>
<td>thorough</td>
<td>seal</td>
<td>revise</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>deputy</td>
<td>fellow</td>
<td>zenith</td>
<td>risks</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>knife</td>
<td>voyage</td>
<td>spice</td>
<td>tacit</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
stake
store
cost
amused
poster
masterpiece
lustres
style
stages
steamer
stave
chests
guests
infused
faster
registers
elastic
best
stop
wastes
voiced
dismissed
ministers
coasters
already

sweep
raises
necessity
exist
exercise
aware
necessary
walk
wag
awoke
swiftest
swear
voices
laces
leases
census
possessive
worry
assail
daisy
beset
science
saucer
joyous
saw-dust

assume
carry
absence
business
officer
arrive
pray
keeper
blows
couple
delicacy
places
reply
cable
claim
smuggle
stable
label
cloud
desirable
title
crow
cruises
break
trust

address
ledger
great
crowd
reader
crossing
robber
louder
dream
track
pride
breathe
apply
country
week
black
cloth
price
bottles
cost
supposed
sorry
assist
lesson
happy
Dear Robert:

I was very pleased to receive your letter last Saturday and to hear of the good news which it contained. I am glad that you are teaching at the Technical and Commercial College and that you find the work so agreeable. I shall always be pleased to hear from you whenever you can spare the time to write.

I like your suggestion that we should spend a holiday on tour with our bicycles, but I am afraid that the district you suggest will not prove so interesting nor so enjoyable as some other parts of the country which we might cover. As you are probably aware, the country round Norwich is very flat indeed and whilst the Broads are interesting, the scenery cannot be compared with that of the West. Instead of taking the route you mention, I would suggest that we make a tour of the Wye Valley with the starting point at Hereford, returning by way of Bath and the Midland Counties. I am sure you would enjoy this round, because there are so many places of interest through which we should pass, and, although cycling would be a little harder, we should be well repaid for our efforts. If, however, you have already been over this part of the country, a further suggestion would be to go up into the Lake District and spend most of the time walking instead of cycling; or, if you are fond of climbing, you would find
many opportunities among the mountains for this kind of enjoyment. Perhaps you will consider these suggestions and let me know what you think about them. If you are able to come to Liverpool at Easter we could discuss them together and I have no doubt would soon reach a decision.

Yours sincerely,

Fred.
Explaining that they have not attempted in any way to consider problems of policy, the committee nevertheless are of the opinion that the economic information available in Great Britain is inadequate to enable the country to deal with the difficult economic questions with which the country is faced. The committee agree that the disclosing of information alone will not create industrial peace, but they are satisfied that industrial peace cannot be attained without it. In an atmosphere of secrecy, it is said, it is impossible for the wage-earners to be sure that they are receiving equitable treatment, or for the public to form a sound opinion on the merits of any particular dispute. An analysis of industries in which a certain amount of publicity already exists convinces the committee that the collection of complete and reliable statistical information has been useful in industrial negotiations, since all parties are made aware of the true position. The information, however, is very partial, and the committee recommend as a necessary and practical minimum that it should include the following points for each industry:

(a) total production,
(b) cost of material,
(c) cost of labour.

It is not suggested that the actual results of particular firms should be published, but that they should be made
available to the public in an aggregate form.

The committee recommend that the Board of Trade should be given statutory powers to inaugurate a scheme of publicity, although it should be permitted to delegate its powers where there is a representative body in an industry capable of doing the work. It is also suggested that particulars should be furnished of stocks, deliveries, and orders, since it is believed that this information will tend to check violent fluctuations in trade and mitigate the risk of sudden trade booms and depressions. In the interests of investors the committee also recommend the publication of much fuller information of company trading accounts. The report indicates further points on which additional particulars might be made available in the interests of the public, as well as of those who are personally concerned with individual industries.
Dear Madam:

You are the winner of the enclosed certificate which is sent as a result of your grading in our recent art test. We congratulate you upon your success.

You seem to understand one of the very important fundamentals in art, and that is proper proportion. Though your technique is not perfect, we believe it is superior to that of the average untrained artist. Your questions have been intelligently answered and are an indication of good artistic understanding.

With this tested proof of your ability, we believe you can enter training with a good chance of success in the commercial art field. There is reason to believe that you should be able to earn a good income, in a comparatively short time. Your opportunity has come and we are going to be very much interested in your progress, for it can easily be seen by your work that you should do very well as a commercial artist.

Again let me tell you how glad we are going to be to welcome you as a student. Your progress will be followed very closely and we are counting on you for big things. You should be a credit to yourself and our schools. I will be glad to see you make your start, not only because the work of an artist is so fascinating, but because I believe that your ability should bring good returns in dollars and cents. That means financial independence—having what you want.

I am glad you received the grading you did. We send you our hearty congratulations. Please do not forget the date, because your certificate cannot be accepted by us unless your application reaches us before July 30.

Yours truly,
Mr. President, I shall be very brief in what I have to say. They tell us that we are seeking to confer special favors on a certain class of our citizens. I recall the time when we did single out these ex-service men and distinguish between them and all other classes of our people. I remember when we cited them to appear when others had no notice to appear for service in the Army and in the Navy. I recall when we took them away from their homes and loved ones. We did not ask them whether they were ready to go or willing to go. We notified them that they had been drawn under the draft system for service, not only to fight in their own country, to repel an invading foe, but that they were to do something that no United States soldiers had ever done before, namely, go abroad and fight on foreign soil, with foreign armies. We placed special duties upon them then, different from that imposed upon any other citizen.

We are told here that these men are not entitled to any special consideration; that they should be treated like the other citizens. Many of them would have been delighted to have been treated that way in 1917. Many of them saw boys remain at home that they thought ought to go to the war; but they did not murmur. Not one of them raised his hand in protest. They put on the uniform of their country. They took guns and marched away, and they gave an account of themselves on the battle line in France that reflected credit and glory not only upon themselves, but upon the people of the United States and upon the allied cause.

Mr. President, we trusted them not only with the little sum they were drawing of $50.00 a month, but we trusted them to protect and guard all the wealth of this Nation, the richest nation in all the world. We did not fail to trust them then. We flung no cloud of suspicion upon them then. We did not in any way belittle them then. But long after our fortunes were preserved, and long after the profiteers have made their millions, ridicule is hurled at them.

It seems that the soldier boy who stood between us and the German Army is forgotten now. The cry of distress that comes up from these ex-service boys in the States, the notice given that the wolves of want and hunger are howling around their doors, and that their loved ones are in distress do not seem to appeal to some gentlemen now who were patting the boys on the back in 1917 when they were journeying to a foreign battlefield to protect their rights and their interests.
Mr. President, during the two years that these boys were serving their country in uniform, the men who remained at home, many of whom are now strongly opposing this arrangement, made millions for themselves out of the war.
TEST 8

DEPARTMENT OF EDUCATION, B.C.
High School Examination, June, 1930.
Third-year Course, Commercial.
Shorthand Dictation (Time, 3 hours.)

(To the Presiding Examiner. - Three hours are to be allowed the candidates from the time that the dictation is finished. Provide candidates with plain white letter paper, or books, for transcripts; and with foolscap, or stenographers' notebooks, for taking notes. Notes may be taken with either pen or pencil. Transcripts may be either pen-written or type-written. The teacher of the candidates may dictate the selections, and may be given the material fifteen minutes before dictating, so that he may prepare the timing of his dictation. Important. - The teacher's dictation must be closely checked for time; and he must be positively stopped at the end of the fifth minute on each selection.)

(To the Dictator. - The dictation must be at a uniform rate of speed with close attention to the quarter-minute marks and with watch in hand. The material must not be read, nor any word in it mentioned, prior to the actual dictation. Allow three minutes after each section, in order that candidates may review their notes and recover from the tension of a five-minutes' take.)
(To the Candidates.- Candidates will hand in three transcripts
A, B, and C. Each transcript should begin on a separate page.
Shorthand notes must be handed in. Examination number must
be placed on each separate sheet.)

"A"

(Eighty words per minute. Syllabic intensity not exceeding 1.5)

The information of the agencies is given out in three
forms:

(1) Daily sheets containing mention of all new
(1/4) incorporations, bankruptcies,
failures, and new business establishments;

(2) a quarterly register or directory (1/2) of
the name, capital rating, and credit rating
of every individual and firm in the United
States and (3/4) Canada occupied in mer-
cantile, financial, or industrial calling; and

(3) special confidential reports furnished (1)
on request to subscribers, concerning any
specific business house. Every precaution
is taken (1/4) against the use of these re-
ports for purposes not legitimately merce-
tile. They are carefully detailed (1/2)
summaries of the character, history, ability
of the individual in question; his wealth
and debts, social (3/4) standing and habits;
and a general expert opinion as to the ex-
tent to which his credit is good and the
proper (2) manner of approaching him. The
report is intended to put together signific-
ant facts, from which the experienced (1/4)
credit man can build up his own impression.

The general directory contains the names of all firms
doing any (1/2) important business in the United States, ar-
ranged by States and cities, with an assigned rating for each
firm. One (3/4) agency publishes the names and addresses,etc.
of 1,300,000 firms and corporations. These are frequently changed by additions, obliterations, and other altered ratings, but every effort is made to keep them up (1/4) to date.

Naturally, this material is impartial, and it is now largely prepared with the active assistance of (1/2) the houses which are being rated. Houses wish to establish an accurate rating upon going into business, (3/4) especially where their dealings are in distant markets. In this way the commercial world is dependent upon the responsible agency.

The two ratings given in the quarterly rate book are the capital rating - an estimate of the amount of the (1/4) capital invested; and the credit rating - an estimate of the degree of confidence which can safely be granted (1/2) to the given firm or individual. These ratings are the final judgment of the agency's experts, and that they are usually (3/4) sound may be surmised from the confidence placed in them by the entire business world. The capital rating is the opinion (5) of the commercial value of the assets.

The protection of forests from fire is undoubtedly the most urgent and most important part of the work of the different agencies administering forest lands (1/4) in Canada. In the case of the Dominion Government, this duty falls
chiefly on the Forest Service of the Department of the Interior for all Dominion (1/2) Crown timber lands, whether within forest reserves or not. Certain officers of the various forest authorities are appointed ex-officio officers of the Board of (3/4) Railway Commissioners and are responsible for fire protection along railway lines. These guards co-operate with the railway fire rangers employed by the various (1) railway companies, the compulsory patrol of all lines throughout the country being a Dominion law. Other Dominion legislation regulates the use of fire for clearing (1/4) and other legitimate purposes and provides for closed seasons during dangerous periods.

Each of the Provincial Governments maintains a fire protection organization which co-operates with (1/2) owners and licensees for the protection of all timbered areas, the cost being distributed or covered by special taxes on timber lands.

An interesting development (3/4) in this connection in the province of Quebec is the organization of a number of co-operative protective associations among lessees of timber limits. (2) These associations have their own staffs, which co-operate with those of the Board of Railway Commissioners and the Provincial Government. This latter contributes in the (1/4) way of money grants and also pays for the protection of vacant Crown lands lying within the areas of the association's activities.

The most important (1/2) single development in forest
fire protection in late years has been the use of aircraft for the detection and suppression of incipient forest fires, constituting a measure of prevention rather than a cure. Where lakes are numerous flying boats can be used both for detection and for the transportation of fire-fighters and their equipment to fires in remote areas.

Where safe landing places are few, land machines are used for the detection and inspection of fires only. The aircraft are equipped with wireless and can report the exact location of a fire as soon as it has been detected. These aircraft can be used incidentally for exploring remote areas and mapping them by means of aerial photography.

As a general rule aircraft are used in the more remote districts, while lookout towers connected by telephone lines and equipped with wireless are established in the more settled and more travelled forest areas. While these agencies have to a large extent supplanted the old canoe, horseback and foot patrol for detection of fires, a large ground staff with its equipment stored at strategic points will always be necessary for the fighting of larger fires and the maintenance of systems of communication and transportation and of fire lanes and fire guards in the forest.

The most important improvement in forest fire fighting equipment has been the portable gasoline fire pump. These pumps, which weigh a little over a hundred pounds, can deliver efficient water pressure three or four thousand feet.
If I can appreciate my honourable friend’s position in this matter, he is very desirous of protecting both the investors and the consumers in a reasonable and fair way. I cannot quite agree with his view as to the amount of power likely to be used in Canada. I find that he bases his estimate largely on that made last July by the power commission.

That commission estimated that some 40,000 horsepower would be adequate for Canadian consumption. But one of the members of the Ontario commission has told us today that 120,000 horsepower has been applied for in Ontario, and that, to a very large extent, that power would be derived from Niagara Falls.

How is the minister going to ascertain which estimate is correct? Yet that is an important matter to determine before the government grants any licenses.

Suppose a company invests several millions in developing power at Niagara Falls with the intention of shipping the surplus to the United States. If that company has the assurance of being able to ship 100,000 horsepower to the United States during ten years, it knows what it is doing, and it builds its lines accordingly. Its customers likewise know what they are going to receive, and they know further that at the end of that period the probability is that
this surplus supplied to them (2) will be required by the
Canadian consumers and they will be no longer able to get it.

But if the right to ship power to the United States
may be (1/4) taken from that company at any moment, the situ-
ation is altogether different.

It seems to me that it is of paramount importance that
a definite period should be fixed within (1/2) which the right
to export could be exercised, and that time should be suf-
ciently long to enable the company to recoup itself for the
cost of its transmission lines to (3/4) the United States and
the shipment of that power.

That is also of importance from the point of view of
the purchaser. Suppose there be no period fixed and the (3)
company offers to sell to American manufacturers. The first
question the purchasers will ask will be: For how long a
period can you supply us with this power? And the (1/4) in-
ability to give such a guarantee may prevent the company from
doing any business on any kind of a favourable basis.

If these licences may be cancelled at any moment (1/2)
at the will of a minister, then the company cannot fail to be
at a very serious disadvantage. Governments change and so
do ministers, and the minister of to-morrow may (3/4) come to
the conclusion that all the power developed is required in
Canada, although his predecessor may have held quite a differ-
ent opinion.

If I had a power plant, (4) I would much rather have
the right to export a limited amount of power within a fixed
period than the right to export a larger amount and be subject to \((1/4)\) the possibility of having my licence revoked at any moment. Therefore, I think that before finally deciding on an important clause of this kind, we should consider it from every point \((1/2)\) of view, and with the greatest possible care.

Suppose, for instance, a man has invested his money in a power plant and then offers to sell to an American consumer. \((3/4)\) The American consumer refuses to purchase unless the other will contract to give him his supply during a certain number of years. What, under such circumstances, can the minister do? \((5)\)
APPENDIX G.

Sounds as Expressed by Pitman and Gregg Shorthand.

<table>
<thead>
<tr>
<th>Sound</th>
<th>Pitman</th>
<th>Gregg</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>1. By a dot. If the sound of &quot;a&quot; in &quot;fat&quot; or &quot;pa&quot;, it is written at the first of the outline; if the sound of &quot;a&quot; in &quot;fate&quot;, it is written in the middle of the outline. 2. By writing the outline above or on the line.</td>
<td>1. By a large circle in all cases.</td>
</tr>
<tr>
<td>b</td>
<td>1. By a downstroke.</td>
<td>1. By a downstroke.</td>
</tr>
<tr>
<td>c</td>
<td>1. Is either &quot;s&quot; or &quot;k&quot; in both systems.</td>
<td></td>
</tr>
<tr>
<td>d</td>
<td>1. By a downstroke. 2. By halving the preceding consonant in certain cases.</td>
<td>1. By an upstroke. 2. By a short disjoined upstroke in certain cases.</td>
</tr>
<tr>
<td>e</td>
<td>1. If necessary, by a dot in the middle of the outline for short &quot;e&quot;, and at the end for a long &quot;e&quot;. 2. By writing the outline through, or on the line.</td>
<td>1. By a small circle in all cases.</td>
</tr>
<tr>
<td>f</td>
<td>1. By a curved downstroke. 2. By a hook on certain consonants in certain cases.</td>
<td>1. By a curved downstroke.</td>
</tr>
<tr>
<td>h</td>
<td>1. By an upstroke. 2. By a downstroke. 3. By a tick. 4. By a dot.</td>
<td>1. By a dot.</td>
</tr>
<tr>
<td>Sound</td>
<td>Pitman</td>
<td>Gregg</td>
</tr>
<tr>
<td>-------</td>
<td>--------</td>
<td>-------</td>
</tr>
<tr>
<td>g</td>
<td>1. By a horizontal stroke.</td>
<td>1. By a curved horizontal stroke.</td>
</tr>
<tr>
<td>i</td>
<td>1. By a small &quot;v&quot;.</td>
<td>1. By a large circle with or without an indentation.</td>
</tr>
<tr>
<td></td>
<td>2. By writing the outline above the line.</td>
<td></td>
</tr>
<tr>
<td>j</td>
<td>1. By a downstroke.</td>
<td>1. By a downstroke.</td>
</tr>
<tr>
<td>k</td>
<td>1. By a horizontal.</td>
<td>1. By a horizontal.</td>
</tr>
<tr>
<td>l</td>
<td>1. By a curved upstroke.</td>
<td>1. By a horizontal curve.</td>
</tr>
<tr>
<td></td>
<td>2. By a curved downstroke.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3. By a small initial hook to straight consonants.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4. By a large initial hook to curved consonants.</td>
<td></td>
</tr>
<tr>
<td>m</td>
<td>1. By a horizontal.</td>
<td>1. By a horizontal.</td>
</tr>
<tr>
<td>n</td>
<td>1. By a horizontal.</td>
<td>1. By a horizontal.</td>
</tr>
<tr>
<td></td>
<td>2. By a small final hook.</td>
<td></td>
</tr>
<tr>
<td>o</td>
<td>1. By writing the outline on the line, or above the line, depending on the sound.</td>
<td>1. By a hook.</td>
</tr>
<tr>
<td></td>
<td>2. By a dash placed either at the first or in the middle, depending on the sound of the vowel.</td>
<td></td>
</tr>
<tr>
<td>p</td>
<td>1. By a downstroke.</td>
<td>1. By a downstroke.</td>
</tr>
<tr>
<td>q</td>
<td>1. By adding a large hook to &quot;k&quot;.</td>
<td>1. By &quot;kw&quot;.</td>
</tr>
<tr>
<td>Sound</td>
<td>Pitman</td>
<td>Gregg</td>
</tr>
<tr>
<td>-------</td>
<td>--------</td>
<td>-------</td>
</tr>
</tbody>
</table>
| r     | 1. By an upstroke.  
      | 2. By a downstroke.  
      | 3. By a hook.       |
| s     | 1. By a stroke.     
      | 2. By a circle.     |
| sh    | 1. By an upstroke.  
      | 2. By a downstroke. |
| t     | 1. By a downstroke. |
      | 2. By halving the preceding character. |
| shun  | 1. By a large hook. |
      | 2. By a small hook. |
      | 3. By "sh" and "n". |
| u     | 1. By a vowel written beside the stroke. |
      | 2. By writing through the line. |
| v     | 1. By a heavy downstroke. |
      | 2. By a hook on a straight stroke. |
| w     | 1. By a consonant.  
      | 2. By a hook.       
      | 3. By a vowel.      |
| x     | 1. By "k" or "g" and "s". |
| y     | 1. By a stroke.     
      | 2. By a vowel.      |
| z     | 1. By a stroke.     
      | 2. By a circle.     |
|      | 1. By a hook.       
      | 2. By a dash under the vowel. |
|      | 1. By "s" written on a different slant. |
|      | 1. By a small circle. |
|      | 1. By "s" with a mark under, if distinction is necessary. |
BIBLIOGRAPHY.

The writer had great difficulty in getting any recent literature on the particular phase of the study of shorthand systems in which he was interested. There is a very fine collection of books on Shorthand in the New York Public Library but very few are of recent date. There are a number of studies in the methods of teaching shorthand in the library of Teachers' College, Columbia University, which the writer consulted, but they had little direct bearing on the study of the two systems given in this thesis. This is probably due to the fact that Gregg Shorthand is taught in over 95% of the schools in the United States and therefore the problem does not warrant the attention which the problem is receiving in Canada where Pitman is taught in the majority of schools at the present time.
BIBLIOGRAPHY.