THE CORRELATION BETWEEN
THE ABILITY TO READ AT SIGHT
AND THE ABILITY TO PLAY BY EAR

A Thesis Presented for the
Degree of Master of Arts

by

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THE OHIO STATE UNIVERSITY
1947

Approved by:

[Signature]
ACKNOWLEDGEMENTS

The writer is deeply indebted to Dr. M. E. Wilson for his inspiration, encouragement and valuable help throughout the preparation of this thesis.

To the musicians whose willing cooperation made this experiment possible, I am most grateful.

To my wife, whose encouragement has been a constant source of inspiration, I wish to express my most sincere appreciation.
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Chapter I
INTRODUCTION

"It is a well known fact that many leading concert artists read
music slowly and with much stumbling. Quite a few years ago one of the
world's greatest violinists, much praised for his flawless technical
skill, attempted to play with first violins of one of our outstanding
symphony orchestras. In rapid passages he was totally unable to
keep up with them. A famous pianist is said to be unable to read quite
simple selections correctly.

"On the other hand, there are many types of performers who can
read three or four relatively independent melodic lines of a fugue
and play them simultaneously on the piano or organ with few errors.
This might seem superficially like doing several things at once, but
it is actually a unified, well integrated pattern of activity." \(^1\)
Scientific research thus far has made little or no progress towards
discovering what pattern of activity is present in the process of read-
ing complex material with accuracy and speed.

Can our conservatories rightfully be credited with producing
musicians when they produce automatons? The performance of an auto-
maton might be likened to the repertoire of a piano student who can
artistically enjoy a piece only after much repetition. Certainly the
ability to play at sight gives the individual the opportunity of
perusing many works. He can discover the satisfaction of playing much
Bach. He can feel the power of Beethoven from very personal experience.
He can catch the shimmering, transparent, illusive ideas of our
impressionists such as Debussy and Ravel. Thus from first hand exper-
ience he can come to know the various styles of composers and the

\(^1\) Bean, Kenneth E., Reading Music Instead of Spelling It, The Jour.
of Musicology, Music Science Press, Greenfield, Ohio, Vol. 1, No. 1,
May, 1947

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characteristics peculiar to each individual pianistic school. As in literature, we read the works of the masters for the pleasure of it and absorb their vital messages through this reading, we do not read and reread except for enjoyment and for the purpose of memorizing; and this we do only on such passages that are considered most worth while. Thus we cannot expect to memorize the entire of music literature, but must read much of it as we would read a new novel, a new poem or a new history. Some typical reactions from musicians to the question of the value of being able to read music at sight are as follows:

Dr. Walter Damrosch: "Sight reading is a necessary part of music education because it enables the student to obtain a wider acquaintance with music literature." 1

Mr. George Gartlan, Superintendent of Music in the high schools of New York City: "Sight reading is necessary for all musicians because without ability to read, a musician is handicapped in whatever direction he turns.2

Dr. Willem van de Wall, director of music, Louisiana State University: "...necessary for professionals; desirable for amateurs, but not essential, depending upon the case." His reasons given for this statement are: "To afford opportunity to make a reading acquaintance with music without having to go through the time-devouring ordeal of extended practice in order to obtain an impression of the music at hand. Secondly, to facilitate ensemble work." 3

It has long been a debated subject by musicians as to whether or not sight reading can be taught. There have been many opinions expressed, but very little accurate scientific data to ascertain the answer. What are the capabilities of the good sight reader? What qualities does he possess? Can these be taught? How? The conflict on the facts of the case is brought clearly into focus by examining the views of various musicians on the subject. The opinion of many famous musicians was solicited in a questionnaire. Here are their views:

2.) Ibid, p. 166
3.) Ibid, P. 166
Dr. Walter Damrosch: "The rudiments for sight reading can be taught, but facility will come only through constant application. Natural endowments are, of course, helpful, but supervision by a competent musician is desirable at first in order to insure correct reading."¹

Miss Sara Compinsky, pianist of the internationally known Compinsky trio: "At least one third of each day's practicing should be devoted to reading. At every lesson I check by reading, to see if my student is adopting the correct procedure. All reading material must be several grades easier than the student's technical ability. Both hands must be used simultaneously at the very beginning, at a sufficiently slow tempo to enable the pupil's eye to see at least two notes ahead. Prepare the fingers and fingering of both hands, and only when all is set, play both hands, and then proceed to look at the next two notes. When this has become simple to the pupil, use the same procedure, with four notes ahead, then with a measure, two measures, a whole line; each time waiting for the eye to assimilate the music before playing.

"When a pupil has become so proficient as to read a whole line, by the method of 'pause--look--play' then, for the first time he tastes the joy of ensemble playing: four hands at the piano with another pupil, or with another instrument, or as accompanist to a singer.

"At this stage he must cease being a soloist and become conscious of another musical voice. He no longer is permitted to 'stop--look--play'; he now learns to blend his rhythm with another's rhythm, and he plays as many notes as he can see, and lets the rest go by the board, without stopping; always listening to the other instrument. He feels the count inwardly and also hears what the other voice is doing with the rhythm.

"At first, all this, like the elementary work, is done with simple and slow music. Little by little, the difficulties and tempo increase, until -- there is a music reader."²

Mr. Louis Compinsky, the first teacher of all three members of the trio, says that it requires "reading, then reading, and more reading. Nothing else will do."³

Here are the replies of Mr. George Gartlan to questions on this subject. He believes that facility in reading music can be taught and that natural endowments, such as rapid eyes, mobile fingers, good

1.) Kerley, Jane, op. cit., p. 166.
2.) Ibid., p. 166.
3.) Ibid., p. 166.
coordination, are important to any student.¹

Dr. Willem van de Wall relates his own experience in answer to the question regarding the best method of teaching reading:

"As far as my own experience goes, one of the methods I recommend is to give the pupil music to read which lies within his technical range of comprehension and execution; a great deal of music, without affording him an opportunity to practice it. This repertoire may be extended to the upper range of his technical ability, but should not go beyond it, so that he will not resort to 'faking'."²

".....without the discipline of habits of accurate concentration, an expression of the musical text as inculcated by precise teaching, endowments such as rapid eyes, mobile fingers, a good coordination may become detriments and again lead to 'faking', and the more the natural endowment, the more precise teaching will count."²

Mrs. Fanny Ross Henbest, a piano teacher of Washington, D. C. has this to say on the subject:

"It is not possible for me to concede that sight reading can be taught. However, it can be improved according to the natural equipment of the individual, this equipment referring chiefly to coordination and tactile sense. A quick eye -- good coordination -- and good tactile sense spell a good reader. A defect in any one of these requires much help".³

On the subject of "stop--look--play" Mrs. Henbest expresses this view:

"Having to stop ruins the sense of anything, and music should be read with due regard to punctuation, just as literature is read; but a nonstop goal in mind usually creates tension. I urge its abandonment in favor of the same viewpoint one has in reading poetry."⁴

Dr. Leonard Deutch, whose normal piano classes in Vienna were sought eagerly by teachers, holds to this thought:

¹. Ibid, p. 166
². Ibid, p. 166
³. Ibid, p. 166
⁴. Ibid, p. 166
"Sight reading certainly can be taught by using a very large and rich study material, which should be difficult enough that the student has to struggle for it, but not so difficult that he will be defeated. He will overcome the difficulties if he plays with accuracy, relaxing physically and mentally, never forcing speed.

"For establishing facility in sight reading, correct instruction is much more important than any natural endowment. Rapidity of eyes and mobility of fingers are improved steadily by training in coordination."

Such confusion of thoughts on how to solve reading problems is a good indication that here is a real opportunity for some scientific investigation. Has there been any attempt made to clear away the debris -- to separate the essential from the non-essential? Before we can go ahead we must look for a moment at what little scientific data there is available on the subject. We must know what has gone before us in order to know what has yet to be done.

Recently two psychologists who made an extensive study of the music-reading problem began their experiment with this question: "What were your experiences in music sight reading?" The volunteer subjects were nine advanced piano students of Northwestern University School of Music. After their sight reading histories were taken, each of the nine subjects was observed and scored in regard to his actual behavior while reading music. Every factor that was chosen for observation had the approval of other students of reading problems as being pertinent to the ability to read well. The following factors were investigated:

1. Eye movements. This tested the amount of contact with the score.

2. Reproduction with eyes closed. This tested imagery and familiarity with the keyboard.
3. Ability to give material meaning. This tested alertness.

4. Span of attention as measured by reproduction. This tested the ability to read groups of notes rather than single notes.

5. Ability to read notes that occur rarely (leger notes).

6. Ability to read ahead. This tested speed of reading.

7. Ability to read under distraction. This tested the amount of attention used while reading.

8. Ability to profit from preliminary study. This tested the ability to recognize and remember complexities.

Results of these tests showed that there were great differences in what the subjects did while reading. For example, some looked at the keyboard only twice, while others looked at it thirty-eight times for the same material. There was also a difference in the quality of the glances, good readers sometimes made many very quick eye movements from score to keyboard. All good readers either made few eye movements or very quick ones. Other discrepancies in behavior were equally great.  

Mr. Kenneth L. Bean, Ph. D. conducted a series of experiments with a variety of music material from the simplest to the most complex. Patterns of this material were mounted on nearly seven hundred cards. These cards were then mechanically exposed for slightly less than one-fifth second each. Ten professional musicians, including two internationally known concert artists, and thirty students of music ranging from beginners to the most advanced took part in the experiment. These individuals were tested to determine how much material they could perceive at a glance, whether they read by groups of notes or by single notes, what kinds of patterns were easy and what kinds difficult, and what sorts of errors.

were made by different performers on different types of material.

Briefly the results show that efficient readers among professionals or students recognize a large variety of patterns as a whole at a glance and play them accurately, while inefficient readers do not get very many patterns as a whole, but usually see one or two notes clearly and often guess the rest incorrectly if they guess at all. These poor readers get a few familiar patterns vaguely, and sometimes guess them right, but they seldom see a whole group of notes at once clearly enough to play them accurately.¹

Another experiment conducted by the same experimenter was the use of his seven hundred cards as practice material for twenty-four students, most of them advanced and considered talented and a few neither efficient nor gifted in music. Short exposures were mechanically produced as before, with the performer seated at the piano. Errors were recorded. Each subject practiced over a period of weeks from twenty to thirty hours altogether. Almost nothing was memorized by any person, but the ability to grasp patterns at a glance improved greatly during this practice for many of the students. Nearly all of them improved at least a little. The improvement for most individuals was first in speed and later in accuracy. A few, at the end of the practice, remarked that they could now see the notes so fast that their fingers could not keep up with their eyes.²

Lannert and Ullman conducted an experiment to find what the factors are in the reading of piano music. Their results were as follows:

1. Subjects with a history of much sight reading were definitely superior to those without.

²) Ibid
2. Good readers read ahead of the measure being played, perceived both right and left hand scores at a single glance, took the least time, and made the fewest errors in reading.

3. Knowledge of the keyboard without vision, ability to profit from preliminary study were the factors which discriminated the good from the poor readers slightly less effectively.

4. Good readers could not play under distraction.

5. Three factors were not significant in discriminating the good from the poor readers:
   a. The number of eye movements from score to keyboard.
   b. The ability to read leger line notes.
   c. The amount of time taken for study.¹

The experiments that will not be reviewed here have little more to add to what we already know about the ability to read at sight. Some of these are included in the bibliography for use if the reader wishes to refer to them for further study.

This is a beginning. However there are many phases which have not been subjected to accurate experimentation and it is to these untouched aspects that we now turn. Thus far experiments have dealt primarily with the visual sense. What part does the ear play in musicianship? We all appreciate the tremendous part the ear plays in performing on an instrument such as the violin; but what about the value of the ear in playing the piano?

Dr. Thomas Tapper says that one listens to music effectively only when the sense of sight is withdrawn. "It is only with closed eyes that one

¹) Lennert, V. and Ullman, M., op. cit.
can keep the sights and the movements of things and people from intruding upon the listening concentration.\(^1\) If this be true the ear should guide us more in sight reading than the eye. In other words, it seems logical to think that if we can mentally hear a chord before it is sounded, we are more likely to play it correctly.

Music reading, or music learning might be likened to learning the English language. It involves a coordination of the visual, the auditory and the kinesthetic senses. Suppose we take a child and follow his growth in the ability to understand, speak and read his native language. From the time he is born, he is surrounded by people talking. His ear becomes attuned to the inflections and to different tone qualities as employed by different people. Gradually he distinguishes his mother's voice from that of his father, sister or brother, and, little by little, individual words take on meaning for him. Before he is two years old, he can understand a good bit of the conversation going on about him without being able to participate in it or contribute much more than a word or two. Thus the auditory phase is established first. Secondly, the child learns to form the words that he recognizes vocally. This is the kinesthetic phase. By the time he enters school, hearing and speaking his native tongue have become automatic with him. There remains only the visual phase for him to master.

It would seem to follow, that an individual, when subjected to an educative process as intensive as his language training would learn to read music with the same ease. We are not saying that every individual should study music as intensively. We are saying that we should be able

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\(^1\) Tapper, Thomas, I Always Have a Picture in My Mind, The Etude, Theodore Presser Co., Vol. LXII, No. 10, October, 1944, p. 568
to find some method which assures an individual who does pursue music seriously of being able to read it with the same ease that he reads a book at the end of a similar amount of study.

Suppose we now follow through the process by which a child learns to read music. From infancy he hears music from the radio, and perhaps some music in the home. However, it is hardly possible by any stretch of the imagination to assume that the amount of music heard could approach the number of words heard each day. In the average home it would be safe to say that the amount of music a child could hear before the age of two years is negligible. Then the kinesthetic phase may follow here as it does in language learning. The child may learn to produce tones with his vocal chords followed soon by the ability to sing short easy melodies; or, if encouraged, he may begin to study at the piano as early as five years of age -- even earlier in some cases -- yet this phase does not come as early as speech. Obviously, the processes involved in the kinesthetic phase of music learning are more complicated than in language learning.

Now, where in the study of language at six years of age, the child's chief concern is with the visual phase, in music he is concerned with the combined phases of the visual and the kinesthetic. Assuming that a child is going to start piano lessons at an average age (let's say eight or nine years) how does his teacher begin? In most cases the child has a piece of music placed in front of him and in the first lesson is expected to coordinate the eye with the hands. If he becomes able to sing the tune he is playing, it is entirely incidental. Even where the teacher uses the auditory approach, he can hardly be said to have acquired
the ear for music that he has for his language.

If the auditory sense is so important to reading, perhaps it is also important in learning to read music at sight. If this is so, how does the ear function in reading music? Are good ear players also good sight readers? All of which leads us to the problem of finding the correlation between ear playing ability and sight reading ability.
Chapter II
PROCEDURE

A questionnaire that was used in an earlier experiment along the same lines was revised. It is this questionnaire (Plate I) which comprises part one of our test. For the second part of the test it was decided to ask the subject to play by ear three selections of his own choice. From this we noted the chord vocabulary of the individual, his technical ability, how artistic a performance he rendered and also made a check of the number of errors. Lastly then for the third part of the test, the subject was asked to read at sight three numbers selected from the following accompaniment books:

Higher Book of Songs - Foresman
Music, The Universal Language - McConathy, Morgan, Lindsay
Our First Music - Armitage, Dykema, Pitcher, Rossman, Vandevere
Music Highways and Byways - McConathy, Beattie, Morgan
Singing Youth - Farnsworth, Dykema, Armitage

The selections used were chosen at random by the writer from the best of music literature. These were graded from easy to difficult as accurately as possible. Each subject was given three numbers to sight read. The writer's choice of the first selection for each subject was based on the subject's years of study as indicated by him on the questionnaire and on hints received from conversation with the subject. Obviously, having heard the first selection, choosing the second and third was not difficult. As with the ear playing, we noted the technical ability, the artistry of the performance, and the number of errors.

The subjects for our test were fifty people who had the combined

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PLATE I
QUESTIONNAIRE

Name ____________________________ Sex ____________________________

List music courses you have had:

a) ________________________ e) ________________________
b) ________________________ f) ________________________
c) ________________________ g) ________________________
d) ________________________ h) ________________________

So you have absolute pitch? ____________________________

(1) List the musical instruments you can play; (2) Check the instrument you play now; (3) List training you have had on each instrument, and (4) ages at which you received this training.

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What instrument do you play by ear? ____________________________

Did you play by ear before studying harmony? ____________________________

If you have a favorite key, what is it? ____________________________

List some of your favorite pieces:

| a) | b) | c) | d) | e) | f) |

What musical radio program is your favorite? ____________________________

Have you served as piano accompanist at any time? ____________________________

Can you improvise? ____________________________

Does your father play an instrument? _____ Does he play by ear? _____

Does your mother play an instrument? _____ Does she play by ear? _____

Do either your brother(s) or sister(s) play an instrument? ____________________________

Are they older or younger than you? ____________________________

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ability of ear playing and music reading. They were selected at random. However, it will be taken into account that a majority of them were music students at Ohio State University, due to their accessibility. How this factor affects our results will be indicated later. The scoring of the subjects is rather involved. We will explain it in detail to show the accuracy of our findings. For each person there are four grades, two are subjective grades based on the examiner's own evaluation of the individual's playing, and two are objective grades based on the number of errors. For the subjective scoring we used: 1 - excellent, 2 - good, 3 - fair, 4 - poor. For example, one person might be rated good in his ear playing and poor in his sight reading. This would give us the numbers 2-4 on his sheet. For the objective scoring we have based our work on the number of errors. In the ear playing, since the subject was asked to select his own numbers, it is assumed that he chose those with which he was familiar and which were commensurate with his ability. Thus a straight check of his errors was made. An absence of errors was given a rating of excellent; one and two errors was rated as good; two to six errors was fair and anything above that was poor. In the sight reading, since different grades of material as designated by the writer were used, a different method had to be used to determine the subject's position as to excellent, good, fair or poor.

Step I.

The selections used for testing the sight reading were arranged by the writer according to his best judgement. The resulting order is as follows.
LIST OF MATERIALS USED FOR SIGHT READING

1. Flow River, Flow - Russian Folk Song - p. 27, Music Highways and Byways
2. Christmas Legend - German Tune - p. 152, Singing Youth
3. Invocation of Orpheus - Peri - p. 52, Singing Youth
4. There Is a Garden - Campion - p. 271, Music, The Universal Language
5. Evening Hymn - Brahms - p. 197, Music, The Universal Language
6. Fingers Dance - Tyrolean Folk Song - p. 116, Our First Music
7. Reapers' Song - Schumann - p. 171, Our First Music
8. The Trumpets - Mendelssohn - p. 117, Our First Music
10. Glorious Things of Thee Are Spoken - Haydn - p. 70, Music Highways and Byways
11. Pater Angelicus - Franck - p. 196, Music Highways and Byways
12. Contentment - Beethoven - p. 174, Music Highways and Byways
13. Now Let Every Tongue Adore Thee - Bach - p. 294, Foresman
14. Behold A Branch Hath Flowered - German Carol - p. 381, Foresman
15. Largo - Handel - p. 178, Foresman
16. Beethoven Excerpt - p. 154, Our First Music
17. The Day of Rest - Mendelssohn - p. 268, Singing Youth
18. Dense Forest - Lully - p. 284, Singing Youth
19. The Fisherwoman - Jannsen - p. 4, Singing Youth
20. Music in China - Chinese Folk Tune - p. 3, Singing Youth
21. Spring Song - Schumann - p. 67, Singing Youth
23. To Our Alma Mater - Brahms - p. 90, Music, The Universal Language

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LIST OF MATERIALS USED FOR SIGHT READING - (cont'd)

26. In The Boat - Grieg - p. 190, Music Highways and Byways
27. To The Sunshine - Schumann - p. 124, Music Highways and Byways
28. O Saviour Sweet - Bach - p. 65, Music Highways and Byways
30. It Was a Lover and His Lass - Morley - p. 82, Singing Youth
31. A Prayer - Redman - p. 280, Singing Youth
32. Ships - Mozart - p. 68, Singing Youth
33. Or Let The Merry Bells - Handel - p. 4, Music, The Universal Language
34. Shaded Grove - Lully - p. 48, Music, The Universal Language
35. Waltz and Scene from "Faust" - Gounod - p. 56, Music, The Universal Language
36. Come Soon - Brahms - p. 136, Music Highways and Byways
37. Little Folk Song - Schumann - p. 128, Music Highways and Byways
38. May Night - Brahms - p. 139, Music Highways and Byways
39. Sanctus - Cherubini - p. 112, Foresman
40. Sanctus - Mozart - p. 262, Foresman
41. Singing Wanderers - Donizetti - p. 234, Foresman
42. Hunting Song - von Weber - p. 257, Foresman
43. Evening Song - Franz - p. 134, Music Highways and Byways
44. In My Garden - French Song - p. 128, Singing Youth
45. Monotone - Cornelius - p. 56, Singing Youth
46. In May - Schumann - p. 54, Singing Youth
47. Hallelujah - Handel - p. 225, Music, The Universal Language
Step II.

This step shows each individual's relative difficulty with each pair of compositions sight read. For example: a subject read number six, with four errors; number eight, with seven errors; and number one, with seven errors. This gives us:

6 - 4
8 - 7
1 - 7

The three numbers played by each of the fifty subjects were thus set down. By comparing each number that each subject played with each of the other numbers he played, it was possible to determine their relative difficulty. Thus, No. 8 was more difficult for that individual than No. 6 by three errors (subtract 4 from 7). Thus, No. 8 with three errors is equal in difficulty to No. 6, or No. 6 is easier than No. 8

Step III.

In order to be more accurate, the writer rearranged the selections according to the evidence derived from the reactions of the subjects. By taking each pair of numbers, it was possible to find the relation of each number to every other number and thus place them in a more reliable order, so far as the subjects used in this experiment were concerned. The new order is as follows.
REVISED LIST OF MATERIALS USED FOR SIGHT READING

1. Behold A Branch Hath Flowered - German Carol - p. 381, Foresman

2. Fingers Dance - Tyrolean Folk Song - p. 116, Our First Music

3. The Trumpets - Mendelssohn - p. 117, Our First Music

4. O Saviour Sweet - Bach - p. 65, Music Highways and Byways

5. Largo - Handel - p. 178, Foresman

6. Verdant Meadows - Handel - p. 66, Music Highways and Byways

7. To Our Alma Mater - Brahms - p. 90, Music, The Universal Language

8. Reapers' Song - Schumann - p. 171, Our First Music


10. Glorious Things of Thee Are Spoken - Haydn - p. 70, Music Highways and Byways

11. Panis Angelicus - Franck - p. 196, Music Highways and Byways

12. Contentment - Beethoven - p. 74, Music Highways and Byways

13. Now Let Every Tongue Adore Thee - Bach - p. 294, Foresman

14. Monotone - Cornelius - p. 56, Singing Youth

15. A Prayer - Redman - p. 280, Singing Youth

16. Dense Forest - Lully - p. 284, Singing Youth

17. Music in China - Chinese Folk Tune - p. 3, Singing Youth

18. Spring Song - Schumann - p. 67, Singing Youth

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<td>Or Let The Merry Bells</td>
<td>Handel</td>
<td>p. 4</td>
<td>Music, The Universal Language</td>
<td></td>
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<tr>
<td>54.</td>
<td>Waltz and Scene from &quot;Faust&quot;</td>
<td>Gounod</td>
<td>p. 56</td>
<td>Music, The Universal Language</td>
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<td>Chadwick</td>
<td>p. 13</td>
<td>Music, The Universal Language</td>
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<tr>
<td>56.</td>
<td>To The Sunshine</td>
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<td>p. 124</td>
<td>Music Highways and Byways</td>
<td></td>
</tr>
<tr>
<td>57.</td>
<td>Who Is Sylvia</td>
<td>Schubert</td>
<td>p. 339</td>
<td>Foresman</td>
<td></td>
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<tr>
<td>58.</td>
<td>The Fisherwoman</td>
<td>Janssen</td>
<td>p. 4</td>
<td>Singing Youth</td>
<td></td>
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<tr>
<td>59.</td>
<td>May Night</td>
<td>Brahms</td>
<td>p. 139</td>
<td>Music Highways and Byways</td>
<td></td>
</tr>
<tr>
<td>60.</td>
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<td>Cherubini</td>
<td>p. 112</td>
<td>Foresman</td>
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<td>61.</td>
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<td>p. 262</td>
<td>Foresman</td>
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<tr>
<td>62.</td>
<td>Singing Wanderers</td>
<td>Donizetti</td>
<td>p. 234</td>
<td>Foresman</td>
<td></td>
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<tr>
<td>63.</td>
<td>Hallelujah</td>
<td>Handel</td>
<td>p. 225</td>
<td>Music, The Universal Language</td>
<td></td>
</tr>
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<td>64.</td>
<td>Shaded Grove</td>
<td>Lully</td>
<td>p. 48</td>
<td>Music, The Universal Language</td>
<td></td>
</tr>
</tbody>
</table>
Step IV.

For purposes of correlation, the list was divided into twelve groups according to the difficulty as shown by the dividing lines in the new order above. Each group has an index number ranging from one to twelve.

Step V.

It was next necessary to determine how much should be deducted from the subject's score for each error he made in playing. This was done by pairing the numbers for difficulty. Since No. 24 is in group 10, and No. 9 is in group 3, it is apparent that the two errors lowered the score seven groups, or $3\frac{1}{2}$ per error. That is, if we use the group number as the score of the subject, each error should lower his group $3\frac{1}{2}$.

The same procedure of evaluating the errors was carried on in forty-nine cases, which seemed to be sufficient for a fair evaluation, and the average of these cases was taken and found to be 2. Each error that a subject made therefore lowered his score 2.

Step VI.

By adding his three scores together, we arrived at his final score.
Subject I

<table>
<thead>
<tr>
<th>Group</th>
<th>Selection</th>
<th>Errors</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>8</td>
<td>7</td>
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<tr>
<td>2</td>
<td>1</td>
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</table>

Subject II

<table>
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<tr>
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<th>Selection</th>
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</thead>
<tbody>
<tr>
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<td>10</td>
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<td>1</td>
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<td>7</td>
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Subject III

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</thead>
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<tr>
<td>6</td>
<td>13</td>
<td>0</td>
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<tr>
<td>1</td>
<td>4</td>
<td>0</td>
</tr>
</tbody>
</table>

In order to lower his score 2, we multiplied this figure by the number of errors, giving us:

Subject I

<table>
<thead>
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<th>Group</th>
<th>Errors</th>
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</thead>
<tbody>
<tr>
<td>2</td>
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</tr>
<tr>
<td>2</td>
<td>14</td>
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</tbody>
</table>

Subject II

<table>
<thead>
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<th>Group</th>
<th>Errors</th>
</tr>
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<tbody>
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<td>9</td>
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<tr>
<td>10</td>
<td>2</td>
</tr>
<tr>
<td>7</td>
<td>8</td>
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</table>
Subject III

<table>
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<th>Errors</th>
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</thead>
<tbody>
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<td>6</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

Then subtracting the errors from the group number we get:

Subject I

\[
\begin{align*}
2 - 8 &= -6 \\
2 - 14 &= -12 \\
2 - 14 &= -12 \\
-30 &
\end{align*}
\]

By adding the results we find that subject No. I has an index number of -30. Our final number grading of the sight reading runs from an excellent plus 30 down to a poor minus 42. This explanation should enable the reader to understand the correlation tables which follow.

It should be of some value to anyone interested in this question of sight reading to know just why the selections used in sight reading should fall in the order difficulty which was found. Why did number 36 prove to be easier than number 24; 43 easier than number 31, etc.? Some evaluation of the problem involved should give us a better insight into the difficulties in sight reading.

By a close check of the types of errors and their frequency some generalizations were made. Only two people made the same mistake in the same place in any one piece; from which we may safely conclude that there are no insurmountable stumbling blocks at which the sight reader is bound to falter. Each mistake is as different as each individual musician. However, we did place like problems in a group to discover which type of problem presented the most difficulty, which was next in order, etc.. The ensuing groups were used and are listed in the
order of frequency of errors:

1. Forty-three simple note errors. These are errors with no apparent reason to them than limited technique.

2. Thirty instances of incorrect notes or notes omitted in chords.

3. A. Twenty-three times a sharp or flat indicated in the key signature was omitted.
   
   B. Twenty-three times the subjects missed accidentals.


5. Thirteen errors in reading leger line notes.

6. Five errors in running passages.

7. Five errors in reaches of a tenth.

8. Four errors in reading bass notes in the treble clef.

9. A. Three errors in playing C flat, F flat, B sharp or E sharp.
   
   B. Three errors in recognizing a key change.

   C. Three times the subject played in the wrong key for several measures before recognizing his error.

10. A. Two errors in reading treble notes in the bass clef.
    
    B. Two errors in recognizing a change in the time signature.

    C. Two errors in playing f sharp in the key of F. (Individuals may have been thinking of the key of one sharp.)

    D. Two errors in tempo.

11. A. One person made more than one start.
    
    B. One person jumped to the voice score instead of the piano score when the page was turned.

This runs the gamut of types of errors. This will not total the same number of errors as the overall total used in grading each individual. In quite a few instances the subject played with hesitancy -- felt his way as it were -- and while he made no actual discords it was not considered fair to rate him in the same class with those of no mistakes and an
excellent rating. In each instance of this, three errors were added to his score for a halting performance.

When it comes to the individual pieces, we should be able to determine to some degree why they fell in the order listed. Two factors keep this from being a thoroughly accurate check. (1.) Since all subjects played different numbers, some selections had only one playing, and thus only one opportunity for us to discover all of the problems in that piece. It seems to follow that the more people who play a number the more chances we have of discovering all of the problems present in it. (2.) Several pieces were played by excellent sight readers who made no mistakes, which gave us no basis for comparison. These numbers could only be placed in order by subjective grading.

It is quite logical that as music increases in complexity it becomes more difficult to sight read. Thus the selections with errors falling only in one or two of the problem groups listed were easy, while selections with errors falling in many of the problem groups were difficult.

All selections in groups one through four had errors falling in one, two or not more than three groups. For example, piece number fourteen, "Behold a Branch" was played by only one person who made four mistakes in rhythm. That is just one problem and places it before number six, "Fingers Dance" which was also played by only one person. This individual made two mistakes, each in a different problem group; first he made one simple note mistake, and second, he played it too slow. These selections both precede number nine, "Verdant Meadows", which was played by three people and which had errors falling in three problem groups: (1) One individual made more than one start; (2) There was one simple note
error; (3) notes were missed in two chords.

In the more difficult music we find four to nine problems presented in a selection; number forty-five "Monotone" had eight people play it; there were four problems represented. Number thirty-one "A Prayer" had five people play it; there were six problems represented. Number forty-three, "Evening Song" had sixteen people play it; there were six problems represented. Number twenty-four "An Easter Canticle" had eight people play it; there were nine problems represented.

Strangely enough those selections which were most difficult and which lay in group eleven and twelve had only one or two problem groups represented. This can only be accounted for by the fact that it was the excellent sight readers who played these accompaniments and who made practically no errors. The problems were there, but their skill was equal to the difficulties.
The tables which have been drawn up for this experiment do not show a precise correlation. This study is primarily to show tendencies rather than measured relationships.

Table I shows the subjective grading of the ear playing as correlated with the subjective grading of the sight reading.
TABLE I
THE CORRELATION BETWEEN EAR PLAYING ABILITY AND SIGHT READING ABILITY BASED ON SUBJECTIVE GRADES.

<table>
<thead>
<tr>
<th>Ear Playing Grades</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
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<tr>
<td>2</td>
<td>4</td>
<td>6</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>10</td>
<td>5</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

1 - Excellent
2 - Good
3 - Fair
4 - Poor
Since this table is based wholly on a subjective reaction to each individual's playing we will include it only because it bears out the truth of our later finding. It can readily be seen that the highest numbers fall in the line - 10, 6, 7, 3 - giving a correlation of excellent with excellent, good with good, fair with fair and poor with poor. While the accurate check of errors in table II changes the numbers, still our picture will remain the same.
# TABLE II

THE CORRELATION BETWEEN EAR PLAYING ABILITY AND SIGHT READING ABILITY BASED ON OBJECTIVE GRADES

<table>
<thead>
<tr>
<th>Ear Playing Grades</th>
<th>Sight Reading Grades</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 2</td>
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<tr>
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<td>2</td>
<td>1 1 1 2 1 2 1 1 1 1 1</td>
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<td></td>
<td>3 2 1 1</td>
</tr>
<tr>
<td>1 1 3 2</td>
<td>1 1 1 1 1 1 1 1 1 1 1</td>
</tr>
</tbody>
</table>

Ear Playing Grades:
- 1 - Excellent
- 2 - Good
- 3 - Fair
- 4 - Poor

Sight Reading Grades:
- 30 - Excellent
- 29 - Excellent down to
- 22 - Poor
- 42 - Poor
In this table we find that the majority of those persons with a high score in sight reading were also excellent in ear playing; those with the next highest numbers from twenty to six were the good ear players; those with low index numbers from one down to minus eleven fall in the fair ear playing group, and finally those with the lowest index numbers from minus eighteen down were the poorest ear players.
TABLE III

INFLUENCE OF HOME ENVIRONMENT UPON ABILITY TO PLAY BY EAR

<table>
<thead>
<tr>
<th>Ear Playing Grades</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
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</thead>
<tbody>
<tr>
<td>4</td>
<td>6</td>
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<td>1</td>
</tr>
<tr>
<td>1</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

Home Environment:

1 - Parents and older brothers and sisters play by ear.
2 - Parents play by ear.
3 - Older brothers or sisters play by ear.
4 - No members of the family play by ear.

Ear Playing Grades:

1 - Excellent
2 - Good
3 - Fair
4 - Poor
This table further bears out our premise that inheritance or even environmental influence has little or nothing to do with ear playing ability. In fact, the tendency is in the other direction. The largest number of excellent and good ear players, six and ten, had no one else in the family with a like ability. Probably these people simply cultivated an interest in music and practiced at ear playing. Only six out of the total fifty came from what could be termed a truly musical family and that fact alone did not insure their excellence, for one of these falls in the fair group.
### TABLE IV

**INFLUENCE OF YEARS OF STUDY UPON SIGHT READING ABILITY**

| Years of Study | 30 | 25 | 24 | 23 | 22 | 21 | 20 | 19 | 18 | 17 | 16 | 14 | 13 | 12 | 11 | 10 | 9  | 6  | 4  | 1  | -2 | -3 | -5 | -9 | -11 | -18 | -21 | -25 | -29 | -30 | -42 |
|----------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 4              | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 2  | 2  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  |
| 3              | 3  | 1  | 2  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 2  | 2  | 2  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  |
| 2              | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  |
| 1              | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1  |

**Years of Study:**
- 1 - 12 to 16 years
- 2 - 8 to 11 years
- 3 - 4 to 7 years
- 4 - 0 to 3 years

**Sight Reading Grades:**
- 30 - Excellent
- down to
- -42 - Poor
This table seems to indicate that the years of study are of very little help in the making of a good sight reader. From the table we see that it is exceptional for anyone with less than three years of piano study to be an excellent or even a good sight reader. Apparently it takes the average person three years to understand the music reading system and to gain some technical proficiency. Only three out of fifty were able to do it with less formal study. On the other hand, if we allow from 20 to 30 to be our excellent sight reading group, we find that the largest number of excellent sight readers, six, had no more than seven years study; and yet only two of those with twelve to sixteen years of study fall in the excellent group. We must assume that these six excellent sight readers were able to grasp the necessary patterns apart from their study, or, the subjects with many more years to their credit would most certainly all fall in this excellent group. The majority of those with the most study could only qualify as good sight readers.
TABLE V

INFLUENCE OF YEARS OF STUDY UPON EAR PLAYING ABILITY.

<table>
<thead>
<tr>
<th>Years of Study</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
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<td>2</td>
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<tr>
<td>1</td>
</tr>
</tbody>
</table>

Ear Playing Grades:
1 - Excellent
2 - Good
3 - Fair
4 - Poor

Years of Study:
15 years down to 0 years.
Apparently ear playing is practically unrelated to years of study. In other words, this only strengthens our supposition that the ear is entirely neglected in formal piano lessons. As the chart shows there are good ear players pretty evenly distributed from no piano lessons to fifteen years of study. And in the excellent group of ear players, six had six years of study or less.
On the following pages will be found: (1) The list of selections used by the subjects in their ear playing; (2) The table of chords used by each subject in his ear playing.

In table VI the chords have been placed in order of their frequency of use with two exceptions -- all of the dominant chords have been grouped together and the added sixth has been placed at the end of the table.
List of Materials for Ear Playing

Abide With Me
Alice Blue Gown
All Through The Night
Always
Anchors Aweigh
Anniversary Song
Auld Lang Syne
Believe Me If All Those Endearing Young Charms
Brahm's Lullaby
By The Forest Spring
Caissons Song
Carry Me Back to Old Virginny
Dark Eyes
Darling Nellie Gray
de Provizna Il Mar
Drink To Me Only With Thine Eyes
Embraceable You
End of a Perfect Day
Flow Gently Sweet Afton
From the Halls of Montezuma
Gettin' Sentimental
I Can't Believe You're in Love with Me
I'll See You Again
I Love You Truly
I'm in the Mood for Love
Indian Love Call
Interregna Vitae
Isle of Capri
I Want a Girl
Just a Wearyin'
Land of Hope and Glory
Liesesalied
Liebestraum
Linden
Loch Lomond
Louise
Love's Old Sweet Song
Memories
Missouri Waltz
Mood Indigo
Mother Machree
Night and Day
Nightingale's Song
Nocturne in Eb - Chopin
Old Black Joe
Old Kentucky Home
Old Refrain
Prisoner of Love
Put on Your Old Gray Bonnet
Rose Marie
Silent Night
Smoke Gets in Your Eyes
Stardust
Star Spangled Banner
Sunday or Monday
Sweet Sue
Swing Low Sweet Chariot
Syrian Folk Tune
There Are Smiles
To Each His Own
Together
Trees
Turkey in the Straw
Two Guitars
Volga Boatman
Waters Ripple and Flow
Way Down upon the Swannee River
When Day Is Done
When Irish Eyes Are Smiling
White Christmas
Without a Song
World is Waiting for the Sunrise


<table>
<thead>
<tr>
<th>Ear Playing Grades</th>
<th>Excellent</th>
<th>Good</th>
<th>Fair</th>
<th>Poor</th>
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<tr>
<td>Totals</td>
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<td>23</td>
</tr>
<tr>
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<tr>
<td></td>
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<td>6</td>
<td>5</td>
</tr>
</tbody>
</table>

A TABLE OF CHORDS USED BY EACH SUBJECT IN PLAYING BY EAR.

Chord Vocabulary

<table>
<thead>
<tr>
<th>I</th>
<th>II</th>
<th>IV</th>
<th>V</th>
<th>V7</th>
<th>V9</th>
<th>V13</th>
<th>V17</th>
<th>VI</th>
<th>VII</th>
<th>I</th>
<th>ii</th>
<th>iii</th>
<th>iv</th>
<th>V7</th>
<th>V9</th>
<th>V13</th>
<th>V17</th>
<th>I</th>
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<td>Chord Vocabulary</td>
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<td>IV</td>
<td>V</td>
<td>VI</td>
<td>VII</td>
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**Totals:**
- 3
- 3
- 3
- 3
- 2
- 2
- 2
- 1
- 1
- 1
- 1
- 1
- 1
- 1
- 1
From this chart it is quite obvious that the good and excellent ear players used a greater number and a wider range of chords than did the fair and poor players. However, it is interesting to notice that the playing of those of lesser ability is not as colorless and ordinary as one might expect it to be. It has generally been supposed that the "ham" ear player uses no more than the I, IV and V chords, yet one individual in the poor group used a minor iv chord in addition to the basic three. In the fair group quite a few chords make their entrance. We find a reappearance of the minor iv again plus the II and the III\(_7\), also the III\(_7\), the diminished, the minor ii\(_7\), the minor vi and one or two others. Again we must refer to the fact that this might be accounted for because of the large number of music students at Ohio State University that are represented. On the other hand, the thought has occurred to us, that we have been wrong in our original assumption that I, IV and V are easy to distinguish while the other chords are more difficult. Might it not be possible that a more unusual chord by its very difference in color might be more readily recognizable than the fundamental chord? A good illustration of this might be the I\(_4\) chord which, as we know, is merely a second inversion of the I chord and thus with the fifth of the scale in the bass bears such a likeness to the V chord that it is not easily distinguishable to the novice. Thus we have only three instances of its correct use by good and excellent ear players. In contrast, we have the II\(_7\) chord with its bright quality which the ear catches quickly. We find forty-four instances of this chord's use by individuals ranging from fair to excellent. Another example of this same thing is the failure of ear players to use the III chord (only three instances) while, on the
other hand, there are twenty-eight people who used the lifting quality of the $III_7$ chord. We might generalize and say that, on the whole, ear players either recognize more readily, or simply prefer the chords with the seventh added to the plain triad.

We would like to cite one more instance where the ear player colors the plain triad extensively. Twenty-eight people elected to use the added sixth in major chords. One additional fact should be mentioned here. In marking the errors for the ear players we did not mark errors by checking against the original score where the ear player enlarged upon the original score. In other words, if the ear player colored the selection thereby making the rendition more beautiful, those chords were put to his credit.

All of this points to the fact that ear players are using those chords which we are constantly hearing in popular and modern music. This indicates that it is not the simplicity of the chord which makes for its ready usage but it is the familiarity of our ear with it.
From the questionnaire it was found that ten of the subjects had had no harmony at all. Their average ear playing grade was "good". Of the remaining forty there were only seven who had not played by ear before they had harmony. The average ear playing grade for these seven was "fair". Of the thirty-three subjects left, all had played by ear before they had had harmony. Their average ear playing grade was "good". We might point out that the average grade for those who played by ear after having harmony was a full grade below the average for those who either had had no harmony or had played by ear before having harmony. The significance of this will be dealt with in a later chapter.
Although the remaining points brought out in the testing are not too important, still they may prove to have significance as we discover more about music learning and music reading. Very often it is the apparently insignificant little things that lead to later consequential findings.

From the questionnaire we found that there were thirty-two people who had done accompanying. Their average ear playing grade was 1.9; their average sight reading grade was 1.3. There were eighteen people who had done no accompanying. Their average ear playing grade was 2.7; their average sight reading grade was -1.0.

From the foregoing grades we see that the accompanists lie one grade above the non-accompanists. That is, the non-accompanists ear playing grade was fair and their average sight reading grade was fair. The average grade for the accompanists in each instance was good. This is like the old question of which came first, the chicken or the egg. Were the accompanists better musicians because of their experience or were the better musicians asked to do the accompanying? We can only guess at the answer. It seems logical that both situations might be true. Probably it was the better musicians who were asked to do accompanying and undoubtedly their musicianship was improved in the process.

There are undoubtedly the exceptional instances in which an individual has been forced into an accompanist’s position despite an admitted inadequacy for the post. A record of his improvement, if any, and how much, multiplied by other such individual instances, would bear further investigation.
Because it is a well-known fact that musicians often have a favorite key, we thought it might be interesting to find out whether or not there was any consistency to their preference. For this reason the question was asked, "If you have a favorite key, what is it?" The following table shows the favorite keys of the subjects and their average ear playing grade together with their average sight reading grade.
# TABLE VII

The relation of the subject's favorite key to his sight reading and ear playing ability.

<table>
<thead>
<tr>
<th>Favorite Key</th>
<th>Number of Votes</th>
<th>Average Ear Grade</th>
<th>Average Sight Reading Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>10</td>
<td>2.2</td>
<td>7</td>
</tr>
<tr>
<td>Eb</td>
<td>5</td>
<td>1.4</td>
<td>19</td>
</tr>
<tr>
<td>Ab</td>
<td>4</td>
<td>2.0</td>
<td>16</td>
</tr>
<tr>
<td>Bb</td>
<td>3</td>
<td>2.3</td>
<td>1</td>
</tr>
<tr>
<td>Db</td>
<td>3</td>
<td>2.0</td>
<td>-22</td>
</tr>
<tr>
<td>D</td>
<td>3</td>
<td>2.3</td>
<td>-10</td>
</tr>
<tr>
<td>C</td>
<td>2</td>
<td>2.0</td>
<td>11</td>
</tr>
<tr>
<td>G</td>
<td>1</td>
<td>1</td>
<td>4</td>
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</table>
There were thirty-one subjects who named a favorite key. In other words about three-fifths of the subjects had a favorite key indicating that a majority of pianists do have a preference in this respect.

Since the majority of the thirty-one subjects favored the flat keys, the question comes to our mind as to why. We also remember that a well known composer of dance music, Irving Berlin, plays only in the key of Gb. It would be interesting to conduct and experiment on this point to find out what, if any, might be the psychological basis for this preference.

At present, we can think of but one possible reason for the preference. In several flat keys it is very easy to remember the fundamental chords. For example, in the key of Gb, the tonic chord is built on the bottom key of the Gb, Ab, Bb group, and the dominant chord is built on the bottom key of the Db, Eb group. In the key of Eb the tonic chord is built on the top black key of the Db, Eb group, while the dominant chord is built on the top black key of the Bb, Ab, Bb group. In the key of Db, the tonic chord is built on the bottom key of the Db, Eb group while the subdominant chord is built on the bottom key of the Gb, Ab, Bb group. Since this is only a guess, it might prove interesting for further investigation.

Apparently, having a favorite key bears no relationship to the average ear playing grade or the average sight reading grade. The average ear playing grade for the thirty-one subjects stating a favorite key was 2.0. The average ear playing grade for the nineteen subjects having no favorite was 2.3. The average sight reading grade for the thirty-one subjects having a favorite key was 3. The average sight
reading grade for the nineteen subjects who did not have a favorite key was 9.
On the following page is a list of composers, or compositions, named by the subjects as favorites. The composers have been placed in periods under the headings Classic, Romantic and Modern. The Popular and Folk Tunes group contains the titles of the tunes only. Beside each composer, we have listed the number of subjects who named him as one of their favorite composers. The same tabulation was made beside each tune. The figures were totalled for each period.

Space was provided in the questionnaire for as many as six favorite composers. Each time a composer was mentioned one or more times by the same subject, he was given one vote.

To designate into which period the subject's preference fell, we used the group which contained the majority of his votes. In other words, one vote for Bach, one for Chopin, one for Schumann and one for Liszt by the same subject would show his preference for the Romantic period. Cases in which the composers named were equally divided between two or among three groups or periods, were treated in this manner. It was assumed that the subject listed the composers in order of his preference. Thus his vote was placed in the period of the composer he named first. This caused the majority of the preferences to fall in the Romantic period since Chopin was named first by so many subjects.
<table>
<thead>
<tr>
<th>CLASSIC COMPOSERS</th>
<th>Number of Mentions For Each Composer</th>
<th>Total Mentions In Each Period</th>
<th>Preference by Period</th>
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</thead>
<tbody>
<tr>
<td>Beethoven</td>
<td>19</td>
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<tr>
<td>Brahms</td>
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<td>Bach</td>
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<td>Mozart</td>
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<td>Haydn</td>
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<th>ROMANTIC COMPOSERS</th>
<th>Number of Mentions For Each Composer</th>
<th>Total Mentions In Each Period</th>
<th>Preference by Period</th>
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<tbody>
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<td>Chopin</td>
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<td>Schubert</td>
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<td>Schumann</td>
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<td>Verdi</td>
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<td>Chaminade</td>
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<td>MacDowell</td>
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<tr>
<th>MODERN COMPOSERS</th>
<th>Number of Mentions For Each Composer</th>
<th>Total Mentions In Each Period</th>
<th>Preference by Period</th>
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<tbody>
<tr>
<td>Debussy</td>
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<td>Albeniz</td>
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<td>Scriabin</td>
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<table>
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<tr>
<th>Tune</th>
<th>Number of Mentions For Each Tune</th>
<th>Total Mentions For This Class</th>
<th>Number of Mentions For Popular Music</th>
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<td>After You've Gone</td>
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<td>Rhapsody In Blue</td>
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<tr>
<td>Always</td>
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<tr>
<td>Alice Blue Gown</td>
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<td></td>
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<tr>
<td>Anniversary Song</td>
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<tr>
<td>Beautiful Dreamer</td>
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<tr>
<td>Body and Soul</td>
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<tr>
<td>Carry Me Back to Old Virginny</td>
<td>1</td>
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<tr>
<td>Desert Song</td>
<td>1</td>
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<td>Guilty</td>
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<td>Londonderry Air</td>
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<td>Lost Chord</td>
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<td>Louise</td>
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<tr>
<td>Night and Day</td>
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<td></td>
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<tr>
<td>Old Kentucky Home</td>
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<tr>
<td>Park Avenue Fantasy</td>
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<tr>
<td>Rose Marie</td>
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<tr>
<td>Smoke Gets in Your Eyes</td>
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<td>Sunrise Serenade</td>
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<tr>
<td>These Foolish Things</td>
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<tr>
<td>The One I Love Belongs to Somebody Else</td>
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<tr>
<td>Warsaw Concerto</td>
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</table>
There were twenty-five subjects who mentioned Chopin, nineteen each who mentioned Beethoven and Brahms, fourteen who mentioned Bach, nine who mentioned Mozart and eight who mentioned Liszt.

It is interesting to find that Chopin far outranked the other composers. This is as we might expect. Since our subjects were pianists it is natural that they should enjoy music written especially for the piano. The music of Chopin belongs to this keyboard instrument and is therefore more enjoyable than transcriptions from other mediums, as we find in some of the works of the same of the other masters.

The writer's explanation for Beethoven and Brahms being chosen second is that these two composers adhered closely to a definite form in their works. There is a solidity and firmness in their music that is gratifying. Then too, there is no mistiness or illusion as to key. We can always feel that we know where we are in relation to the tonic. This is less true of Brahms, however, than of Beethoven. In all, there is a fullness and finality in the works of these two composers that is indeed satisfying. Debussy undoubtedly was placed fourth because of the popularity of "Claire de Lune". We wonder whether or not the seventeen subjects who mentioned this selection were familiar with other compositions of Debussy.

We can only guess why the other composers fell in the order indicated. We are all well acquainted with Bach, Mozart and Liszt so it is only natural that their names should fall next. Probably Liszt was popular for the same reason that Chopin was popular. Since Liszt made many piano transcriptions it is logical that pianists would favor him.

The votes for the other composers were scattered and merely indicate individual preferences.
In the third column of figures we find the preference of each subject as to period. When classified this way, the Romantic period becomes the favorite. It is possible to think of many reasons why the subjects might prefer these composers above all others. We know that the music of the Romanticists has an emotional appeal which could readily give it the edge over the more dispassionate music of the Classicists. Then too, more of the music of Romanticism is taught and heard. Modern music has not been with us long enough to become a favorite. Popular music is not in the lead because most of the subjects have gone beyond this stage in their appreciation. This is one instance where having so many music students as subjects probably has affected our results.
Chapter IV
INTERPRETATION

Let us summarize for a moment. We have been led to conduct this experiment through the conviction that the ear has been the neglected factor in the teaching of music. We know that very fine musicians can read music silently, hearing it in their "mind's ear". Most of the foremost composers have written without the aid of an instrument. The well-trained musician should be able to hear any composition away from the instrument.

Most of Schubert's music was published after his death and he heard very little of it performed. Some of his finest compositions were written away from the piano, for he had no piano.

Lieutenant-Commander John Philip Sousa could read a whole page of a score at a glance.

Berlioz refused the offer of the position of professor of harmony at the Paris Conservatoire in 1838 on the ground that he did not play the piano.

Due to deafness, Beethoven could only hear in his mind's ear all of his later works.

It is logical to assume that anyone who can play by ear must hear what he is playing in his mind's ear before he can reproduce it on the keyboard.

Since we have shown that there is a tendency toward a correlation between the ability to play by ear and the ability to read at sight, these illustrations further serve our purpose by showing the value of the ear.

All of this indicates that these masters had learned certain
patterns which they were able to recognize quickly and to hear silently. In other words, the process of seeing and hearing was simultaneous. Those persons who were able to hear music in their mind's ear were also able to perceive it readily at sight.

The interpretations that follow here are entirely those of the writer. Other solutions might be found -- we only wish to point out that something is wrong.

It would seem that a revision of our methods of teaching piano is in order. Why not teach the beginning piano pupil simple melodies to sing and play, and, after they are learned, let him transpose these same melodies to other keys? Then his ear will be compelled to grasp the melodic, rhythmic and harmonic patterns quickly and surely, patterns that will be retained and recognized readily by ear when reading is introduced.

On the question of when to introduce reading, we are reminded that up to the age of about eight years the child's eyes are not easily able to fixate at any one point for long enough periods, regardless of the size of the print. This makes the teaching of reading a very difficult task for both the teacher and the pupil.

From table III we found that there were more good and excellent ear players from families with no other members possessing the ability, than from musical families. This seems to refute the old assertion so often heard that one must inherit a good ear; that one either has it or he doesn't have it. To those skeptics who claim that this ability to play by ear is inherited, and that we would be wasting our time in trying to teach it, let us give food for thought. Psychology
tells us that specific abilities are not inherited, only general capacities. Thus we now have our vocational guidance tests based on this psychological conclusion. One person who is very adept with his hands has a better than average capacity for intricate needle work, skilled watch repairing, or delicate medical surgery. Another person may have a noticeable capacity for making friends or persuading people, and thus would be successful in salesmanship, the ministry or social work. Yet a third person may have unusual artistic abilities, and so he inherits the right combination for success in art, music, drama or dance. Despite the fact that some of us have capabilities above the average, we know that all average individuals can learn to speak and read. We do have our radio announcers, our 'actors and actresses and our gifted lecturers, but does this mean that the rest of us must be a mute -- an inarticulate audience? What a dull old world this would be! Let us dispense with the idea that one has to inherit his ability or his ear in order to make acceptable and pleasurable music.

The highest grade for the sight readers with more than seven years of study was good. This is a correlation as far as it goes, but to be an acceptable correlation the most years of study should coincide with excellent sight reading ability. Apparently piano study does not help one to attain enough proficiency in this field. If it did, certainly those subjects with twelve to sixteen years of study would rate as excellent sight readers. What patterns did those excellent sight readers learn in seven or less that was not learned by those subjects of double that number of years. This is a problem for further experimentation.

From table V we must conclude that years of study and ear playing ability are unrelated.
From the table dealing with musical taste, the question arises whether to consider the figures indicating preference for period, or those indicating preference for composers more valid. In our opinion, the latter is more valid. According to this tabulation, the Classic composers lead by a small margin.

This certainly indicates a high level of appreciation. Having a majority of university students who major in music for subjects undoubtedly is the reason for this result.

One might ask why the majority of the subjects chose to play popular music in the section of the test devoted to ear playing. The melodic, harmonic and rhythmic patterns of popular music are comparatively simple and are heard again and again; while those of classical music are very difficult for the average person to reproduce by ear.

Our questionnaire on harmony gives us every reason to believe that our ability to hear chords and to play correct progressions on the keyboard is not gained from a formal study of harmony. We are led to make some deductions from the evidence before us. Instead of studying harmony from a book and writing chord progressions by rule, it would be more logical to work directly at the keyboard. Let the students hear good harmonic progressions in samples from the masters; let them try to reproduce what they hear; and finally, let them analyze what they have done that the understanding may aid their learning.

Certainly we must grant that in this business of learning music all of our faculties are valuable to us. By placing emphasis on the ear, we are not disparaging the visual, the, kinesthetic or the intellectual. By this process the student should at last be able to formulate his own rules of harmony, and it is our opinion that at this point the rules would then have some meaning and would not
be easily forgotten. In other words, it would seem that harmony study is a disadvantage to the student because it is placed on an intellectual basis. Apparently it is not actually learned the way it is taught.

In all fairness to Mr. Wedge, Mr. Jones and Miss Alchin we suggest that further experimentation on this point is badly needed. We cannot know how much the ear playing of these subjects improved by their study of harmony. Perhaps their rating was raised from fair to good or even from fair to excellent. If we knew this we would have some true gauge of the value of the present harmony courses. It is suggested that this could be ascertained in this way: Select a group of ear players who have all had the same amount of piano study, but no formal instruction in harmony. Check their chord vocabulary and the accuracy of their ear playing. Select a like number of ear players with the same number of years of piano study, and the same amount of harmony instruction. Check their chord vocabulary and the accuracy of their ear playing. The results should be interesting.

From the table on chords, we see those chords which have proved easiest to catch by ear and the order in which they have been added as the ear players approach the excellent mark. On some such table as this, arrived at in a like manner from experimentation, we might base our revision of the harmony courses. Since this suggests the actual order in which the chords might be learned, it would seem logical to assume that this is the order in which they should be taught.

Perhaps the results of this experiment would be thrown into sharper contrast if there had been included among the subjects two additional groups. The first of these groups would be individuals
rating below the poor ear players, indicating pianists who could only read music. The second group would be subjects rated below the limit of the sight readers, that is, those who could only play by ear.

It seems unlikely that two such groups would upset the results. It is hardly probable that those pianists who were unable to play by ear would crowd the excellent sight reading group, or that those pianists who were unable to read music would crowd the excellent ear playing group. Rather, we would expect them to offer competition largely in the fair and poor groups.

In our experiment many subjects played by ear selections which they had practised many times and could therefore play with few errors; other subjects played by ear in an impromptu fashion, reproducing on the keyboard for the first time those familiar songs stored in their mind's ear. This makes for an unequal basis on which to judge their errors. It might be well for the experimentalist to select, in advance, three piano selections unknown to the subjects. These might be graded easy, medium and difficult. Let the experimentalist play selection number one for the subject until it is learned and the subject is able to play it. In this manner, the number of hearings necessary for retention could be noted in addition to the number of errors. The same procedure could be followed for the other two selections with each subject. This would give the experimentalist an equal basis for comparison and should help us to discover some of the other elements in music learning.

In trying to find subjects for this experiment, the writer contacted a few pianists who could not play by ear. They had made attempts to learn but just couldn't do it. Can these people be taught to play by ear? Can they be compelled to use their ear through intensive application and study? We believe that this can be accomplished.
The writer feels that he has touched upon some vitally interesting subjects for further study and experimentation. There are limitless possibilities in this field and the surface has only been scratched. However, if we have helped in any small measure to point the way to better educational methods, or if this experiment helps in any way to bring more music to more people, it has been well worth the time and effort expended on it.
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