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ILLUSTRATIONS FOR THE BLIND

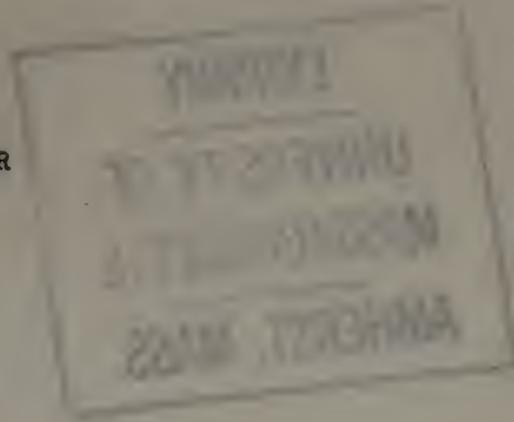
O'ROURKE - 1938

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I L L U S T R A T I O N S F O R
T H E B L I N D

by

Ralph William O'Rourke



Thesis submitted for the degree of

Master of Science

MASSACHUSETTS STATE COLLEGE

Amherst, Massachusetts

June, 1938

OUTLINE OF CONTENTS

	Page
CHAPTER I <u>INTRODUCTION</u>	1
CHAPTER II <u>STATEMENT OF RESEARCH</u> <u>PROBLEM AND PROCEDURE</u>	18
CHAPTER III <u>ANALYSES OF THE SIXTEEN</u> <u>ILLUSTRATIONS</u>	28
CHAPTER IV <u>PERSPECTIVE PICTURES FOR</u> <u>THE BLIND</u>	45
CHAPTER V <u>OPINIONS AND COMMENTS OF</u> <u>THE TESTERS AND TESTEES</u>	50
CHAPTER VI <u>SUMMARY AND IMPLICATIONS</u>	56
VII APPENDICES	
I Test Pictures	67
II Test Cards	68
III Cooperating Institutions and Organizations	69
VIII ANNOTATED BIBLIOGRAPHY	70

LIST OF ILLUSTRATIONS, LETTERS, AND TABLES

Figure		Page
1	BRAILLE ALPHABET FOR WRITER WORK	4
2	BRAILLE SLATE	5
3	BRAILLE TYPEWRITER	5
4	AN INK PRINT COPY OF A BOOK OF POEMS AND A BRAILLE COPY OF THE SAME BOOK	7
5	SAMPLE PAGE FROM "READERS DIGEST" MAGAZINE, BRAILLE EDITION	8
6	PICTURE USING DOTS FOR OUTLINE	12
7	A SECTION FROM A PAGE IN THE PRIMER	15
8	FIRST PAGE OF TEST CARD	22
9	SECOND PAGE OF TEST CARD	23
10	THIRD PAGE OF TEST CARD	24
11	FOURTH PAGE OF TEST CARD	25
12	LETTER EXPLAINING THE BRAILLING IN THE PRIMER	26
13	LETTER SENT WITH TESTS	27
14	RESULTS OF TESTS--GROUP A	30
15	RESULTS OF TESTS--GROUP B	31
16	RESULTS OF TESTS--GROUP C	33
17	RESULTS OF TESTS--GROUP D	34
18	NUMBERS OF TIMES PICTURES WERE CORRECTLY DISCERNED BY SUBJECTS IN DIFFERENT GROUPS	35
19	PICTURES DISCERNED BY <u>ALPHA</u> AND <u>BETA</u> GROUPS AND PERCENTAGES	36

CHAPTER I

INTRODUCTION

Up to a century and a half ago, almost no attempt was made to educate the blind; and sad as the condition of the blind is to-day, it is happiness itself compared with that prevailing at the beginning of the nineteenth century. It was assumed that these unfortunates must go through life dependent, unoccupied, restless; while they resented the fact of their afflictions, there appeared to be no way to fight against its consequences. Most of the blind people of this early date were needy and very often resorted to begging for an existence. The custom of the time was to ridicule this group, and any joke played on them was thought funnier than one played on a seeing person. An incident is told of a certain restaurant keeper hiring a group of blind men, with no knowledge of music, to entertain the guests of the restaurant. Various instruments were given to them to play and discord naturally was the result. The audience was hilarious but in their midst was a young Parisian who was disgusted, and he felt keenly the injustices of making these poor unfortunates become sport for the rest. Valentine Haüy was this gentleman and he decided to see what he could do about teaching the blind to help themselves.¹

Valentine Haüy opened in Paris the first school for the non-sighted in 1784. Later this school was called the Royal Institute for the

¹ The World Book Encyclopedia. Vol. II, p. 792-794.

Blind. This earliest school is still considered one of the best for the sightless. Haüy, at a later date, invented books with raised letters which could be read by the sense of touch; for investigations had long before revealed the fact that this sense was likely to be highly developed in the blind. The first attempts at teaching the blind to read were made by means of raised letters in form similar to the ordinary letters of the alphabet. From one-third to one-half of the younger pupils learned to recognize these characters by running their fingers over them.¹

About a hundred years ago there was admitted to the Royal Institute in Paris, a youngster, Louis Braille, 10 years old and blind almost from birth. He was a good student and soon became proficient in music and science. Later he became a distinguished organist and an unusually fine violoncellist. When he was about twenty years of age, he modified an already existing system of writing for the blind. Braille's system was put into use in the Royal Institute, though not generally adopted until ten years later. It became the standard on the Continent and later in the United States. This method of writing is still used and very few variations have been made.

Braille writing takes as its basis six points, or dots, arranged in two vertical, parallel columns, and shifts them into different combinations to represent letters. This system, as in stenography, has characters for some short words and some combinations of letters.

¹ The World Book Encyclopedia. Vol. II, p. 793.

Most of the hand-copied braille is volunteer work and is cleared through the American National Red Cross and the Congressional Library at Washington, D. C. The alphabet used by the American Red Cross in their braille transcribing is shown in Figure 1.

The chief advantage of braille is that it enables the blind to write as well as read. By means of a pitted board, a perforated metal rule, and a stylus, any blind person may indeed learn to write, with a fair degree of rapidity. Notes in words, figures, or music are within his scope. The writing is done from right to left; the paper is reversed for reading. With the adoption of this system, modern schooling of the blind became possible. The method of transcribing into braille, described in this paragraph, is called the "slate method" and is used by most volunteer transcribers. Figure 2 shows an illustration of the braille "slate". There is in addition a printing-press method of producing reading matter for the non-sighted, and magazines and newspapers are published by this process. A machine, similar to a typewriter and illustrated in Figure 3, has been invented for braille and is being more commonly used. Both these mechanical processes makes necessary expensive equipment, so a great deal of the work is done by volunteers working with the "slate" method.

Brailled books are expensive on account of their limited circulation and bulk. A comparison of the braille volumes with the copy in print of a popular volume of poems clearly indicates the truth

Alphabet for Writer Work ¹

ALPHABET	a	b	c	d	e	f	g	h	i	j	
NUMERALS	1	2	3	4	5	6	7	8	9	0	
WHOLE-WORD	a	but	can	do	every	from	go	have		just	
LINE 1	⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠	
ALPHABET	k	l	m	n	o	p	q	r	s	t	
WHOLE-WORD	knowledge	like	more	not		people	quite	rather	so	that	
LINE 2	⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠	
ALPHABET	u	v	x	y	z	w					
WHOLE-WORD	us	very	It	you	as	will					
CAPITAL AND NUMERAL SIGNS							Capital Sign			Numeral Sign	
LINE 3	⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠	
PUNCTUATION MARKS	,	;	:	.	!	?	apostrophe	accent	Italic sign	decimal point	letter sign
LINE 4	⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠
LINE 5	hyphen			fraction line		quotation marks		parentheses			
LINE 5	⠠			⠠		⠠		⠠			
COMPOUND SIGNS	dash	equality sign	asterisk		single quotes		brackets				
LINE 6	⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠	
WHOLE-WORD SIGNS		and		for		of		the		with	In
PART-WORD SIGNS		and		for		of		the		with	In
LINE 7		⠠		⠠		⠠		⠠		⠠	⠠
WHOLE-WORD SIGNS HAVING DIFFERENT PART-WORD VALUES						shall	this	which		out	
LINE 8						⠠	⠠	⠠		⠠	
PART-WORD SIGNS	ar	ed	en	er	gh	ing	ow				
LINE 9	⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠	
FRENCH ACCENTED LETTERS	ç	é	à	è	ù	â	ê	î	ô	û	
Diæresis—See Rule 11c	ë	ï	ü	ä	æ	ö	œ				
⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠	⠠	

FIGURE 1

¹ Braille Transcribing Manual, American Red Cross, p. 13

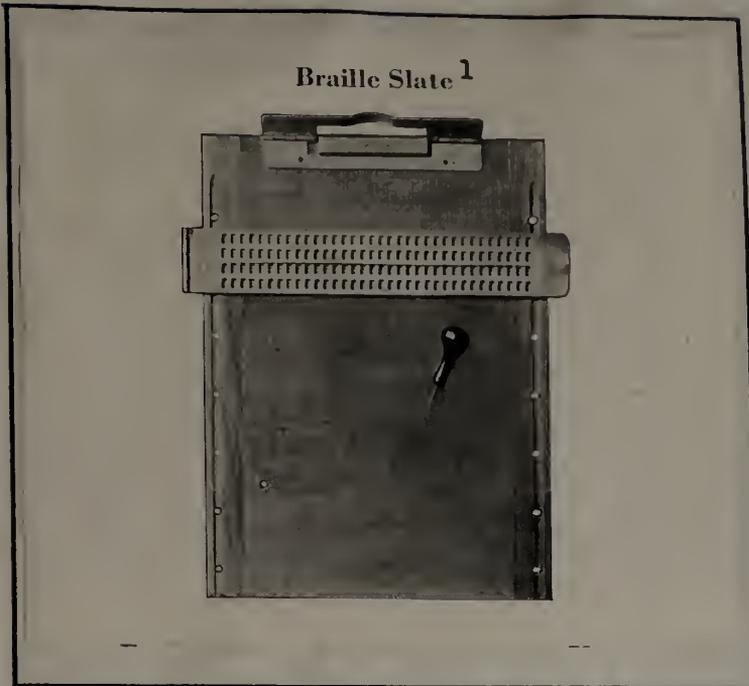


FIGURE 2

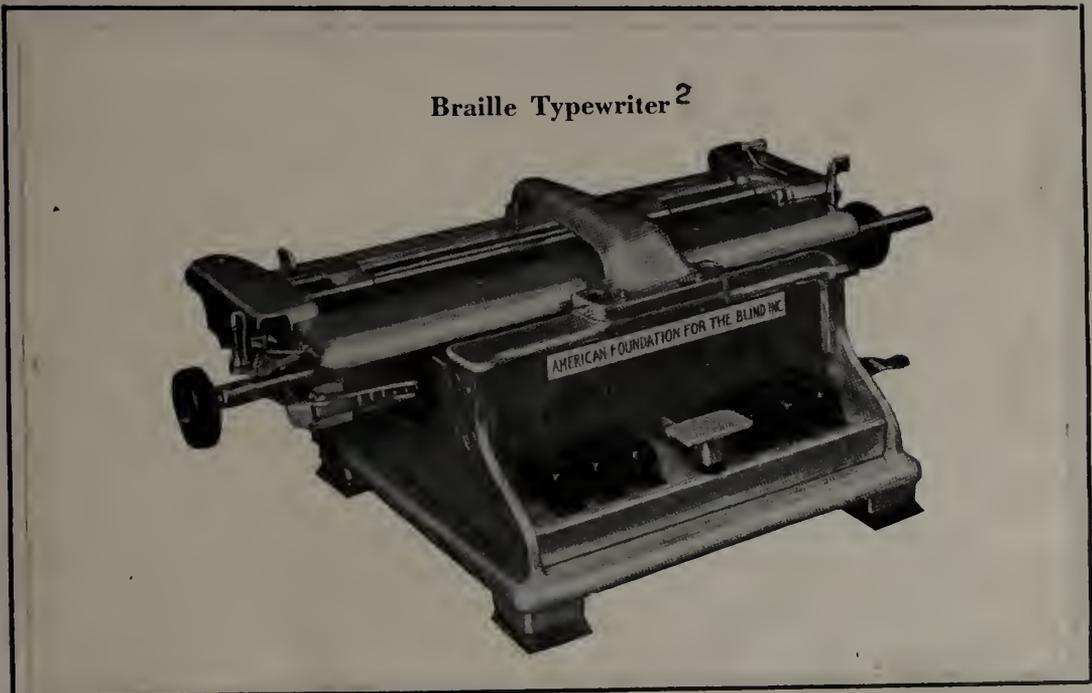


FIGURE 3

¹ Braille Transcribing Manual, American Red Cross, p. 3.

² Ibid.

of this statement. (See illustration in Figure 4.)

The volumns weigh thirty-five pounds and the ink-print copy weighs less than two pounds. The print book has 601 book-size pages and the brailled book has 1,700 pages, 11x11½ inches. The table of contents and introduction requires forty-three braille pages as compared with thirteen in the printed book. The volunteer who transcribed this book of poetry required fourteen months of diligent service. One can readily see that the cost of brail-ling and binding a volumn is prohibitive, and ownership of libraries is not possible for the ordinary non-sighted individuals. The "Readers Digest" publishes, on a non-profit basis and with public support, a monthly magazine for the blind. The material in this braille edition is the same as that which appears in their printed vest-pocket edition. The braille copy of the "Readers Digest" measures 11x13½ inches; and three volumns, about ¾ of an inch in thickness, are required to produce the reading matter. (By off-setting the rows of dots, the commercial braille makes use of both sides of the paper.) The braille edition of the "Readers Digest" costs one dollar a copy as compared with twenty-five cents for the printed edition. A sample of the braille in the "Readers Digest" is shown in Figure 5. The sample represents one-quarter of the standard page.

Approximately 457 people in a million are statistically classed as blind in the United States.¹ About one-half this number are

¹ Federal Census, 1930

Finishes Long Braille Task



Mrs Everett E. Thompson and Red Cross Braille volumes

FIGURE 4--AN INK PRINT COPY OF A BOOK OF
POEMS AND A BRAILLE COPY OF
THE SAME BOOK.¹

¹ Springfield Republican-Union. February 7, 1938, p. 7.

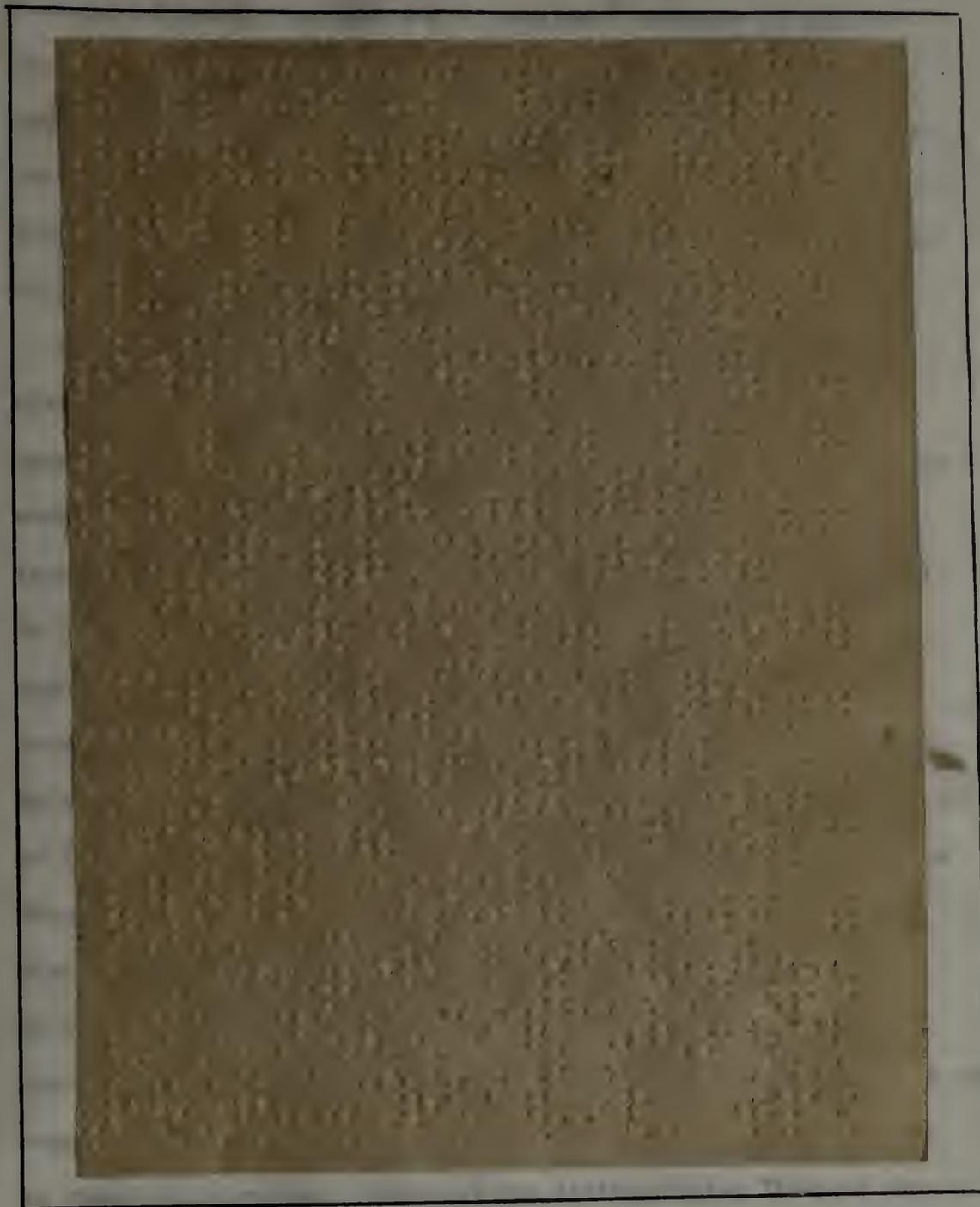


FIGURE 5--SAMPLE PAGE FROM "READERS DIGEST" MAGAZINE, BRAILLE EDITION. THIS REPRESENTS ONE-QUARTER OF THE PAGE. (READING MATTER ON BOTH SIDES OF PAPER.)

over the age of sixty-five years.¹ Only about one-quarter of the non-sighted population make use of braille.² Because of this fact, books cannot be produced for these readers on a commercial basis. Hand-copied books are transcribed on a volunteer basis and are deposited, for withdrawal, with the Library of Congress in Washington, D. C. At the present time over 30,000 books are available to sightless readers throughout the country.³

In connection with this volunteer transcribing, Mrs. Marion C. Hibert of the Springfield Chapter of the American Red Cross, accepted the responsibility of brailleing a Greek history for a girl attending Columbia University. Mrs. Hibert was a public school teacher and as she worked over the 1,600 pages, she often remarked to herself the great advantage sighted people had over the non-sighted in respect to their books and learning facilities. The braille history book was cold and the greatest deficiency seemed to be pictures. Imagine studying Greek history without the pictures of the Parthenon, Winged Victory, Greek ship, Acropolis, etc.! The descriptions could never give one true pictures of these great pieces of art. Mrs. Hibert wondered if this deficiency could not be corrected. She conferred with Mr. Walter Klar and others, and discussed the possibilities of illustrating books for the blind in some manner. At least a little additional information might be brought to these unfortunates. Could not the distinguishing lines of the

¹ Federal Census, 1930.

² Futterer, Susan O. Braille Maps. School Life, November, 1936, p. 74.

³ Ibid.

Parthenon be embossed in some manner so that the readers of this braille book might at least feel the eight columns rising to the cap and also feel the low flat roof? Could not the floral designs and carvings, prevalent in their architecture, be shown graphically?

Mrs. Hibert took her problem to others looking for a simple process of embossing these pictures. Several school men and others worked over the idea and finally after trying a great many different processes and schemes, a method was invented for raising the lines of the pictures. Credit for the invention of this process must be given to Mr. Walter Klar, Supervisor of Industrial and Fine Arts in the Springfield, Massachusetts School System.

Attempts had been made to illustrate braille but the processes used had been varied and none of these had been generally adopted. An entirely new approach to the problem was made by Mr. Klar.

The efforts of these other contributors in this direction are as follows:

1. Applique Idea.¹
Texture pictures or appliqued pictures combining raised outlines with many fabrics.
2. Braille Maps.²
Dots and dashes indicate boundaries.
Tiny dots to indicate water.
Masses of dots to indicate mountains.
3. Political Maps.³
Large dots under names of capitals.
Small dots under names of cities.

¹ Rich, Frank M. Comments on Raised Illustrations. School Arts Magazine, May, 1936

² Futterer, Susan O. Braille Maps. School Life, Nov., 1936, p. 74.

³ Ibid.

4. Pictures using dots for outline. (See Figure 6.)
5. Pictures made by tracing wheel.
6. Pictures made by sewing machine. (No thread used.)
7. Pictures embroidered with cord.
8. Braille Maps.¹
 - Diversity of threads.
 - Soft yarns for rivers.
 - Fish lines for traffic roads.
 - Beads used for other information.
9. Salt and glue maps.²
 - Salt and glue indicate streets.
 - Narrow connected wood strips used for street car lines
 - Wooden crosses for hospitals.
 - Spires for churches.

The problem presented to Mr. Klar was to devise a process of embossing pictures in a very simple manner. The fact that practically all the braille transcribing is done by volunteers delimited the process of embossing. A method was sought that would be practical for use by women, unskilled in mechanical processes. Experiments were conducted using cement and like materials for matrices, and it was found that after a certain number of copies were produced the matrix crumpled. The next step was to carve a figure in "masonite", and then pound the paper into the depression with a soft-rubber hammer. This process was practical on a good grade of bond paper but failed to work on braille paper which is heavier. Experiments were continued, using many materials including "plastic wood"; lead,

¹ Christman, Jean. Construction of Maps for the Blind. Wilson Bulletin, October, 1935.

² Springfield Republican. Maps Permit Blind to Tour City, May 24, 1937.



FIGURE 6--PICTURE USING DOTS FOR OUTLINE.¹

¹ Picture produced by the Braille Department of the Glen Ridge, New Jersey Chapter of the American Red Cross.

copper, and tin foil backed up with a composition; and many other patented materials. All these proved to be impractical from some angle. At last a design was carved into a piece of battleship linoleum and this carving was done with an one-sixteenth inch graining tool. Then a piece of braille paper was placed over this piece of linoleum and the paper was pressed into the incisions with a blunt stylus. Many different styli were used and it was finally proven that a wooden stylus of the correct shape pressed the paper into the carvings to the right depth. An ordinary orange stick was used as a stylus but was blunted to conform to the depth of the cuts. The carvings were the same depth as the pits on the "braille slate". As many duplicates as desired could be made from the one linoleum block. The embossed figures could be made rapidly after a little practice.

This thesis delimits the study to this very low level, as the author feels that though this idea is in a very elementary stage, it is practical and usable for transcribing pictures. Red Cross chapters may make use of this process without the need of expensive machinery or special talents on the parts of volunteers. (The process described was used in making the test pictures used in the study explained in later chapters, and it was found that a set of twenty pictures could be made in less than an hour.)

The practicability of these embossed illustrations was first evidenced when a large number of Christmas cards were made by the Junior

Red Cross in Springfield, Massachusetts. These cards, which were sent to braille readers, had a seasonal message transcribed upon them and at the top of the card a picture was embossed. The non-sighted people received pleasure from this innovation and this interest motivated further work with raised illustrations. Mrs. R. R. Hayden, a blind woman, was asked to write a simple primer with the idea that this primer was to be illustrated with pictures related to the reading matter. Mrs. Hayden readily cooperated and Miss Ida Hubbel, a Columbia University graduate with a Major in Art Education, designed and cut the pictures for the primer using the process invented by Mr. Klar.

The first primer transcribed and illustrated with pictures was a bound volume of sixty-five pages. A section of a sample page from this primer is shown in Figure 7.

This initial primer was given to the blind in Springfield and readers were asked to express their opinions. It was the first time many readers of braille had ever "seen" a picture. Practically all were interested and were anxious to have other books illustrated. The readers made many helpful suggestions and criticisms, and these were carefully noted and later changes were made in some of the illustrations. A few changes made were as follows:

The original cat on page 16 had no whiskers; when they were missed by some of the blind they were added.

The original tree on page 43 was mainly outline to keep

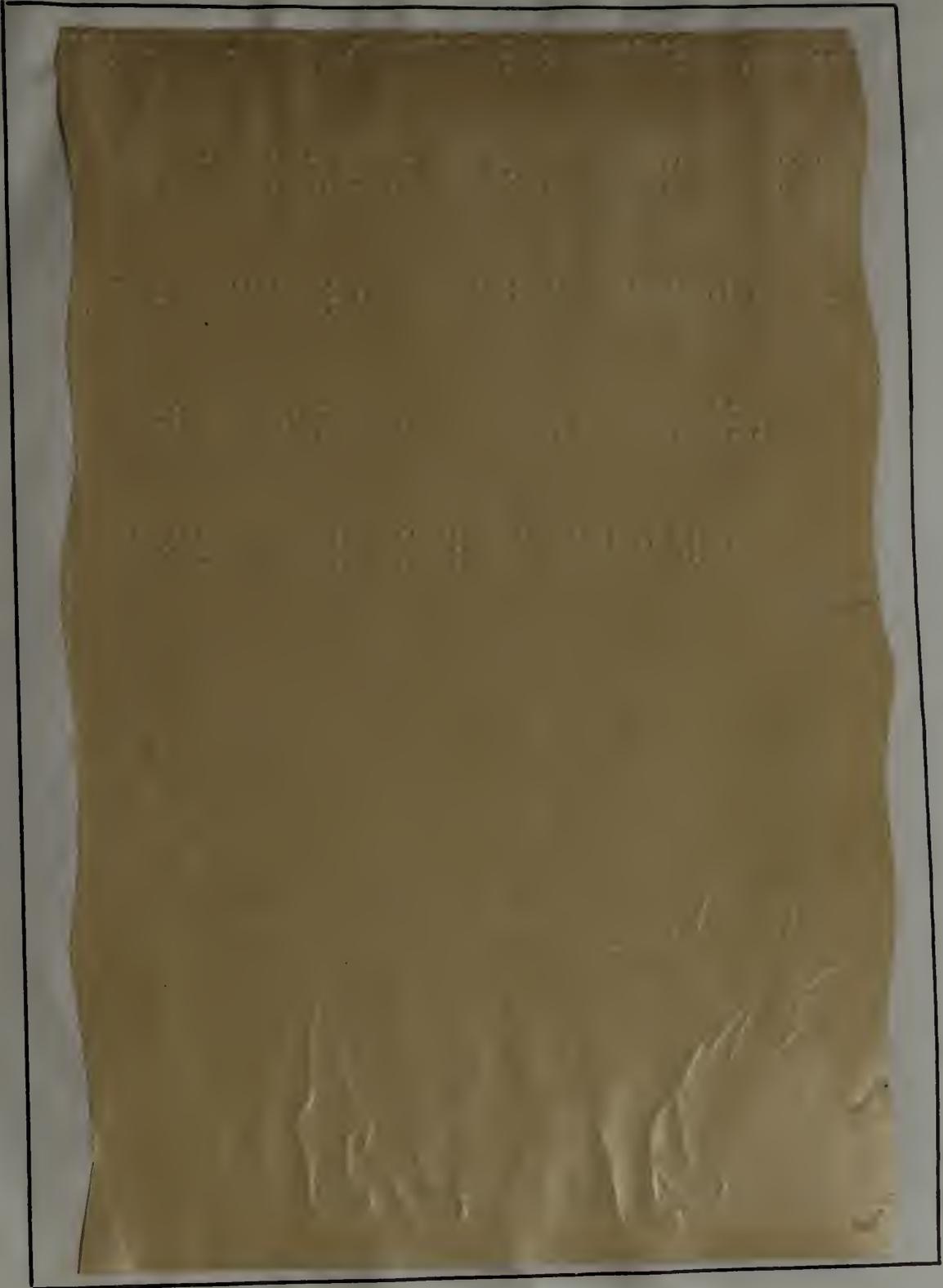


FIGURE 7--A SECTION FROM A PAGE IN
THE PRIMER.

it simple; when they objected that it didn't have any leaves on it, they were added and appreciated.

The original toad and a stone on page 46 was entirely outline and the objection was that they didn't think that they felt right. They didn't show the hard stone and the softness of the toad. This taught the workers to emboss the entire stone. The readers liked it better.

These and other corrections were made and several primers were transcribed and bound. These primers were then sent to different chapters of the Red Cross and to institutions for the blind.

Here was a radical departure from the cold books with which the non-sighted were familiar. There had been no illustrated books placed in the hands of the blind outside of Springfield before. What would be their reaction? The interested parties patiently waited for comments. Soon, very interesting letters arrived and excerpts from some of these letters are quoted:-

"These illustrations have aroused much interest and the braillists of many chapters would like to know how they are done."--Miss Mable Bordman, Chairman of Social Service, National Red Cross, Washington, D. C.

"The book was beautifully done and was loaned to us by National Red Cross to show to some interested people here in Knoxville. Will you please give us full details of the work as some of our transcribers are very much interested in passing on this pleasure to the blind."--Knox County Chapter of the American Red Cross, Nashville, Tennessee.

"The braille primer which contains the fascinating illustrations for children are lovely. I taught a girl, $8\frac{1}{2}$ years old, a few years ago--now at Perkins-- and should have loved to have had this book for her."--Portland Chapter of the American Red Cross, Portland, Maine.

"The pictures have recently been examined by a blind high

school graduate who has been out of school some years, and he was greatly interested. He expressed the same wish that many others have expressed--that more books were illustrated."--Braille Sight Conservation Classes, Newton Street School, Newark, New Jersey.

"I feel that we should flood the child's world with these pictures, so that the children will clamor for them. I feel sure that we will not get from older people the response that the movement really deserves."--Miss Ruth Hayden, State Infirmary, Tewksbury, Massachusetts.

"Of course it is rather hard to imagine a picture when one has no idea of color and probably a distorted one of form, shape and size."--Catholic Institute for the Blind, Williamsbridge, New York.

"I have tested the primer on two bright blind men and you will be interested in their comments. They suggested that if the complete figure was embossed that they would get the outline and the sense of the picture better. This is an adverse criticism but I know you will appreciate it."--Portland Chapter of the Red Cross, Portland, Maine.

"In the picture of the village (in Pied Piper of Hamelin) he first recognized the roofs of the houses and the last thing to be determined was the stone wall. It was, of course, a help to know the pictures illustrated the Pied Piper. He was pleased to know that so many things could be shown on one page, and that action of running could be shown. His experiences in life have taught him to form judgments."--A Newark, New Jersey Red Cross worker.

"The Portland braillists are exceedingly interested and will eagerly anticipate the explanation of the process."--Portland, Maine Chapter of the Red Cross.

"I cannot see how a blind person can possibly get the correct impression from embossed pictures."--Principal of an Institution for the Blind.

"This school is not interested in raised pictures for the blind. Lines and dots which must be felt bit by bit by fingers cannot convey a realistic picture to a blind person."--Sister M. A., A Catholic Institute for the Blind.

CHAPTER II

STATEMENT OF RESEARCH PROBLEM AND PROCEDURE

The comments that were received were so interesting and diversified the author believed some method could be devised of testing the value, if any, of these illustrations for the blind.

The first step in this study was a visit to the Red Cross Works Progress Administration Braille project in Springfield. This project has approximately fifteen sightless people, working with the physically handicapped, transcribing braille. These blind people were asked to read the primer and an opportunity to watch the readers' reactions to the illustrations was afforded.

Sketches of all descriptions were then made and through a weeding-out process a set of twenty pictures was selected. These pictures started with picture Number 1 showing an embossed straight line and were numbered according to their degree of complexity with picture Number 20, theoretically being the hardest to determine. Pictures were selected of objects that the readers of braille were probably in contact with frequently. These sketches were given to Miss Ida Hubbel for revising and after the finished drawings were made, Miss Hubbel carved them into twenty pieces of linoleum using the idea invented by Mr. Klar. After the blocks were made, the sighted people on the Works Progress Administration project made approximately forty sets of pictures using the linoleum blocks and styli. These sets of pictures were numbered in braille and with

Arabic numerals and were used for conducting the tests. A sample set of pictures is in the pocket of Appendix I.

While these pictures were being embossed the author communicated with approximately fifty institutions and Red Cross Chapters throughout the country. The letter shown on page 20 was used.

The quick responses to these introductory letters surprised the author and was taken as an indication that the writers' eagerness showed an interest and possible value in the research. Ninety per cent of the institutions agreed to give the tests to five of their members. Only one institution could see no value in the study, and for this reason, refused to assist. (See Appendix III for cooperating institutions.)

As this raised illustration idea has been designed to be used in braille books and articles, the author devised a set of questions to be asked the subject taking the test. As the picture is given to decipher, the person conducting the test reads a question. In many cases the question may help the subject to find the correct answer to the inquiry, but reading matter would also provide clues in many instances. To parallel this condition and to convey concretely the connection of reading matter with illustrations the test cards were used and an individual card, for answers, was used for each subject. The same set of pictures, in some cases, was used for several tests and could be used for as many as desired. The test card was printed on oak tag stock and was folded. The four

Special Letterhead

Date

Superintendent, Chairman, or Principal
Institution or Organization
City and State.

My dear -----:

A few years ago the Springfield Chapter of the American Red Cross, assisted by interested parties, published a primer for the blind. This primer was illustrated with pictures which were closely related to the text. Several copies of the primer were transcribed, and many favorable comments were received from workers and blind people familiar with braille. This new process of embossing the pictures is very simple and no complicated or expensive machines are necessary. There are indications that great possibilities exist from an educational standpoint.

My research is in this field and I am retracing steps which probably should have been taken before this primer was published. I have worked out a series of tests to be given readers of braille, hoping that I can actually prove that benefits may or may not be derived. Naturally, these tests must be given to a rather large group to be of value, and I am asking different institutions and organizations to cooperate to make the sampling as broad as possible.

The Springfield Chapter of the American Red Cross suggested your organization for research. Would you be willing to cooperate by giving these tests to five of your pupils? I have estimated that possibly an hour will be necessary for the test. They are of such a nature that I am sure the subjects will be interested. Credit for participation in the study will be given your organization when the thesis is published.

The test pictures are at the present time being embossed, and should be ready with printed matter in a few days. If you are willing to assist me in my study I will mail all the material, with instructions, to you in February, but will not do so until definite word has been received from you.

May I expect to hear from you in the near future, and thank you for any interest shown?

Very sincerely,

Ralph W. O'Rourke

pages of the test card have been printed on the succeeding four pages of this thesis. (See Figures 8, 9, 10, 11 and Appendix II.)

The author personally gave the tests to as many blind people, who were readers of braille, as he was able; and made several changes in the original test card. Then Mrs. R. Smith of Springfield gave the tests to several non-sighted people and offered some valuable suggestions. To the institutions and organizations agreeing to give these tests an envelope was sent and this envelope included the following material: one set of test pictures, five test cards, two sample pages from the brailled primer, letter of explanation from the local Red Cross, a stamped return envelope, and a personal letter from the conductor of the research. The inclosed letters from the Red Cross and the author are shown in Figures 12 and 13.

“Illustrations for the Blind”

Answer Card for Test Pictures

(Use one of these for each subject tested)

Data Necessary for Study

Institution or Organization Giving Test.....

Subject's First Name.....

Age in Years.....

How Many Years a Braille Reader?.....

Non-sighted for What Period of Time?.....

Ralph W. O'Rourke
Buckingham School
Springfield, Massachusetts.

Research conducted under the direction of the Graduate School of Massachusetts State College and with cooperation of the Springfield Chapter of the American Red Cross.

FIGURE 8--FIRST PAGE OF TEST CARD.

Picture No. 1. Place subject's finger on line, and explain to him or her that this is an embossed straight line.

Picture No. 2. Place subject's fingers on these two lines, moving from one to the other, and explain that these are two straight lines.

Picture No. 3. Trace this line with the testing person's finger, explaining that this is a curved line.

Picture No. 4. Follow with subject's finger these attached lines explaining that this represents a curved line joined to a straight line.

Using pictures 5 to 20 inclusive, the subject should try to decipher pictures shown. Person giving test will hand the card to subject, read the question asked for each picture, and record the subject's answer on the line below that particular question. *All* answers should be recorded, even though the individual's answer is entirely incorrect. Wrong answers often provide interesting information and will greatly aid the research.

If the question or statement is not clear, the tester may give definitions or explanations of bothersome words. Clues to pictures should not be given, however.

Picture No. 5. A farmer has a square plot of ground and has a certain part enclosed. The lines embossed on this card represent the fenced-in section. How many sides are fenced in?

Picture No. 6. The lines embossed on this paper represent how many sides of a square?

Picture No. 7. The figure represented by this illustration is a common figure used in mathematics. Can you tell what this figure is or how many sides it has?

Picture No. 8. This figure represents a very common religious symbol. What is it called?

Picture No. 9. The outline in this picture represents a local fruit. What is it?

Picture No. 10. The tool depicted in this illustration is very often used by laborers. What implement is it?

Picture No. 11. Every home used to have one of these, and many are still found in the cellars of residences. What does the picture represent to you?

Picture No. 12. These are found on the table at mealtimes. What are these closely associated pieces called?

Picture No. 13. This picture represents a part of the wearing apparel used by all boys in winter. What single item of a pair does this attempt to show?

Picture No. 14. This illustration shows a necessity in the spring. Can you distinguish what it is?

Picture No. 15. This drawing shows one of a pair. They are called what?

Picture No. 16. What is this object called?

Picture No. 17. This article is found in every home and most women are familiar with it. The illustration shows it to be a what?

Picture No. 18. This object is more difficult to distinguish. It appears to be what to you?

Picture No. 19. This, with others, brings us cheer and is important to us. The figure, as drawn, represents what to you?

Picture No. 20. What animal do these embossed or raised lines try to show?

(Important Questions on Next Page)

FIGURE 10--THIRD PAGE OF TEST CARD.

QUESTIONS TO ASK PERSON TAKING TEST

1. Have these illustrations been of any interest to you?
2. Would you like a Brailled book illustrated with pictures? A history book for instance.
3. Could you get any pleasure sitting down and feeling these pictures, if they were made interesting?
4. We are attempting to bring additional information and pleasure to thousands. Have you any suggestions to offer?
.....
.....

QUESTIONS TO BE ANSWERED BY PERSON GIVING TESTS
(Answer on one sheet only.)

1. What is your frank opinion of the idea incorporated in this research?
.....
.....
2. The process of making these pictures is very simple and this set of pictures was embossed in 60 minutes. No expensive machines are necessary and the materials required may often be obtained at no cost. Would you like to know how they were produced?
3. This is a thesis and will be published in triplicate for the college sponsoring same. Possibly it should be published in some periodical read by the workers with the blind. What magazine would you suggest?
4. The findings of the research may prove negative. At least we have information for future research. Would you care to comment?
.....
.....

Signature of person giving test

FIGURE 11--FOURTH PAGE OF TEST CARD.



THE AMERICAN RED CROSS

SPRINGFIELD CHAPTER

275 MAPLE STREET
SPRINGFIELD, MASS.

These are sample sheets from "The Primer," Vol. 1 of "The Junior Braille Readers" by R. R. Hayden. Miss Hayden teaches some contractions of Grade One and a Half and Grade Two in each lesson so these pages use a few contraction-signs but not all.

The illustrations are by Springfield Chapter, American Red Cross.

If you desire to have further information about The Primer, please write to the Chapter at the above address.

FIGURE 12--LETTER EXPLAINING THE BRAILLING
IN PRIMER.

"Illustrations for the Blind"

Research and Thesis Under the Supervision
and Direction of the Department of Education
Graduate School
Massachusetts State College
Amherst, Massachusetts

Mailing Address

Ralph W. O'Rourke
Buckingham School
Springfield, Massachusetts

Your letter received indicating a willingness to cooperate with the Springfield chapter of the American Red Cross and myself in the research project described in my earlier letter. Possibly you would like to know, that in answer to my first letter sent to institutions in twelve states, I have received practically one hundred per cent cooperation.

I am enclosing test pictures and six printed test cards. I believe that the printed matter on the cards will explain the entire procedure. You are not restricted, in any way, in giving the tests and if you desire to give them to adults connected with your organization or institution it is perfectly all right to do so. The only stipulation necessary for this study is that the subjects are readers of Braille.

Thinking you might be interested in the practical use of these pictures I am also enclosing a page from the sixty-five page primer published by the local Red Cross Chapter. This primer's reception by workers with the blind is the motivating factor of this research.

The test pictures need not be returned as sufficient quantities have been made to allow interested institutions to retain same. Test cards, however, should be returned and a stamped envelope has been enclosed for this purpose.

The answers found on the test cards are anxiously awaited and the author would appreciate an early return of the cards as a definite schedule, unfortunately, must be adhered to, in order to fulfill the requirements of the college sponsoring study.

May I at this time extend to you my sincerest thanks for the time given to this innovation and let me assure you that this idea, if of practical value, will never be commercialized. I am sincerely trying to render a service to the non-sighted, and inspiration and encouragement comes from Milton's *Paradise Lost*.

"Irradiate, there plant eyes, all mist from thence,
Purge and disperse, that I may see and tell."

Very sincerely,

Ralph W. O'Rourke
Buckingham School
Springfield, Massachusetts.

FIGURE 13--LETTER SENT WITH TESTS.

CHAPTER III

ANALYSES OF THE SIXTEEN ILLUSTRATIONS

Twenty-one institutions and organizations cooperated by giving the tests to four or five of their students or members. These subjects, coupled with those personally tested by the author, totaled ninety-two. All ages, both sexes, and people non-sighted for different periods were included in this group. Every person taking the test was a reader of braille and was blind. The number involved was not as large as desired. This was due to the limitations necessarily set by the author who admits a larger sampling, based on established levels, would have been a better criterion. The tests were presented to fifty-three people of both sexes, blind since birth or blind since two years or less of age. This group will be referred to as the Alpha group in succeeding chapters. The Beta group includes thirty-nine subjects who have lost their sight after the age of two years, or in later life.

The volunteers in the various institutions and organizations who gave these tests were cooperative and in all cases the tests were given efficiently. The answer card gave the tester implicit directions to record all answers exactly as given and these answers, though in many cases far from being correct, make an interesting study.

The procedure of the test was for the person conducting same to read the paragraph, accompanying the illustration, to the non-sighted person and then, after the subject had felt of the embossed lines of the picture, record the answer on the card. How well these subjects dis-

cerned the pictures may be readily seen from the charts in Figures 14, 15, 16, and 17 on which the subjects have been grouped according to sex and periods of non-sightedness. Groups A and B are the female and male subjects classified as blind since birth, and groups C and D represent the subjects, of both sexes, non-sighted after two years of age. Chart in Figure 18 lists the pictures and graphically shows how many of the subjects, of the four groups, were able to correctly answer the questions after feeling the embossed illustrations.

The first four pictures were simple and the persons giving the tests used these to acquaint the non-sighted with the idea of raised lines. Many of the subjects had never felt embossed lines before, but of course were acquainted with raised dots. Illustrations 5, 6, and 7 were also easy and practically all the subjects immediately obtained the correct answers. Illustrations 8 to 20 were more complex and when the test was set up, the author tried to make the pictures gradually increase in complexity, but the results of the tests indicate that Illustration 20, supposedly the most difficult picture, was distinguished by practically 60 per cent of the subjects of both the Alpha and Beta groups. Many of the lower-numbered illustrations, planned to be less difficult, presented problems and the percentages were lower.

An analyses of the Illustrations 8 to 20 are interesting and each will be discussed separately. The percentages of the Beta group are higher with all illustrations indicating that having sight, sometime during their lives, has aided the subjects to better conceive objects represented by embossed illustrations. (See Figure 19.)

Results of Tests

GROUP A

NUMBER	Subject's Name	Chronological Age	Years Non-sighted	Picture 5	Picture 6	Picture 7	Picture 8	Picture 9	Picture 10	Picture 11	Picture 12	Picture 13	Picture 14	Picture 15	Picture 16	Picture 17	Picture 18	Picture 19	Picture 20	Illustrations been of interest?	Like a Brailled book illustrated?	Cooperating Institution
1	Lorraine	10	10	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	Some	Yes	Perkins Ins.
2	Barbara	18	16	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	Yes	Yes	Indiana
3	Virginia	13	13	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	Yes	Yes	Jersey City
4	Pauline	17	17	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	Some	Better Idea	Maryland
5	Mura	39	39	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	Yes	No	Batavia, N. Y.
6	Madeline	12	12	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	Yes	Yes, if	Hartford
7	Jane	35	35	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	Yes	Yes	"
8	Janina	22	21	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	Yes	Yes	Springfield
9	Frances	9	9	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	Some	Yes	"
10	Paula	17	16	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	Yes	Yes	Yonkers
11	Bertha	13	13	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	Yes	Yes	"
12	Anna	41	41	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	Yes	Yes	"
13	Lucille	39	39	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	Yes	Yes	Michigan
14	Lucile	21	21	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	Yes	Question	Chicago
15	Helen	15	15	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	Yes	Yes	Brockton
16	Loretta	29	29	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	Yes	No	W.P.A. Per.
17	Elizabeth	40	40	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	Yes	Yes	Garfield
18	Rose	12	12	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	Yes	Yes	"
19	Lena	45	45	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	Yes	Yes	"
20	Mrs. Albert	32	30	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	Yes	Yes	Pennsylvania
21	Elsie	19	19	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	Yes	No	Newark
22	Virginia	15	15	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	No	No	"
23	Mary	13	12	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	Yes	Yes	"
24	Viola	13	13	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	Yes	Yes	Brockton
25	Mrs. Carrie	46	46	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	Yes	Yes	Brockton

"X" Indicates subject obtained correct answer.

FIGURE 14---(ALPHA GROUP). BLIND AT BIRTH OR UNDER TWO YEARS OF AGE. FEMALE SUBJECTS.

Results of Tests

GROUP B

NUMBER	Subject's Name	Chronological Age	Years Non-sighted	Picture 5	Picture 6	Picture 7	Picture 8	Picture 9	Picture 10	Picture 11	Picture 12	Picture 13	Picture 14	Picture 15	Picture 16	Picture 17	Picture 18	Picture 19	Picture 20	Illustrations been of interest?	Like a Brailled book illustrated?	Cooperating Institution
1	Phillip	19	19	X	X	X	X	X	X						X				X	Yes	Perhaps	Perkins In.
2	Andrew	11	11		X	X		X											X	Yes	Yes	"
3	Albert	11	11		X	X		X									X			Yes	Yes	"
4	Sylvester	17	17	X	X	X	X	X	X										X	Yes	Yes	Jersey City
5	John	16	16	X	X	X	X	X	X										X	Yes	Yes	"
6	William	14	14	X	X	X	X	X	X										X	Yes	Yes	Maryland
7	Francis	9	9	X	X	X	X	X	X										X	Yes	Not Necessary	"
8	Davis	16	16	X	X	X	X	X	X										X	No	No	"
9	Vernon	19	19	X	X	X	X	X	X										X	Yes	Yes	Batavia
10	Paul	13	13	X	X	X	X	X	X										X	Yes	Yes	"
11	Billy	12	12	X	X	X	X	X	X										X	Yes	Yes	"
12	Donald	16	16	X	X	X	X	X	X										X	Yes	Yes	"
13	Harold	14	14	X	X	X	X	X	X										X	Yes	Yes	Springfield
14	Lawrence	33	33	X	X	X	X	X	X										X	Yes	Yes	"
15	Basil	22	22	X	X	X	X	X	X										X	Yes	Not Necessary	Maryland
16	Davis	16	16	X	X	X	X	X	X										X	Yes	No	"
17	Vennon	19	19	X	X	X	X	X	X										X	Yes	Yes	Yonkers
18	Hensoach	11	9	X	X	X		X	X										X	Yes	Yes	"
19	Bertram	10	10	X	X	X		X	X										X	Yes	Yes	Michigan
20	Eugene	23	23	X	X	X	X	X	X										X	Yes	No	Chicago
21	Aubrey	26	26	X	X	X	X	X	X										X	Yes	Yes	"
22	Larry	7	7	X	X	X	X	X	X										X	Yes	Yes	Garfield
23	Fred	8	8	X	X	X	X	X	X										X	No	Yes	"
24	Edward	8	8	X	X	X	X	X	X										X	Yes	Yes	"

Continued on the next page.

"X" Indicates subject obtained correct answer.

FIGURE 15-- (ALPHA GROUP). BLIND AT BIRTH OR UNDER TWO YEARS OF AGE. MALE SUBJECTS.

Results of Tests

GROUP D

NUMBER	Subject's Name	Chronological Age	Years Non-sighted	Picture 5	Picture 6	Picture 7	Picture 8	Picture 9	Picture 10	Picture 11	Picture 12	Picture 13	Picture 14	Picture 15	Picture 16	Picture 17	Picture 18	Picture 19	Picture 20	Illustrations been of interest?	Like a Brailled book illustrated?	Cooperating Institution
1	Robert	22	19	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	Yes	Yes	Indiana
2	Forrest	18	15	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	Yes	Interesting	"
3	Mr. Sherman	68	56	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	Yes	Yes	"
4	Paul	14	10	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	Yes	Yes	Jersey City
5	Mannin	10	3	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	Some	Might be	Maryland
6	Ralph	15	12	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	Yes	Yes	Hartford
7	John	37	8	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	Yes	Yes	Springfield
8	Fred	51	38	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	Yes	Yes	"
9	Morrey	12	5	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	Yes	Possibly	"
10	Irving	26	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	Yes	Yes	Yonkers
11	Daniel	9	6	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	Yes	Yes	Michigan
12	Paul	17	8	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	Yes	Yes	"
13	John	58	4	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	Very much	Very much	Brockton
14	William	52	0 ^h	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	Yes	No	W.P.A. Per.
15	Albert	42	22	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	Yes	Yes	Garfield
16	Albert	17	9	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	No	No	Newark
17	George	21	3	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	Yes	No	Ansonia
18	Henry	28	3	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	Yes	No	"
19	Joseph	21	9	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	Yes	Yes	"
20	James	26	7	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	Yes	Yes	Newark

"X" Indicates subject obtained correct answer.

FIGURE 17-(BETA GROUP). Blind After Two Years of Age. MALE SUBJECTS.

PICTURE NUMBER	ALPHA GROUP				BETA GROUP				TOTAL
	GROUP A 25 SUBJECTS	GROUP B 26 SUBJECTS	GROUP C 19 SUBJECTS	GROUP D 20 SUBJECTS	GROUP C 19 SUBJECTS	GROUP D 20 SUBJECTS	GROUP C 19 SUBJECTS	GROUP D 20 SUBJECTS	
"	5	25	19	17	16	15	14	13	90
"	6	25	27	19	16	14	13	12	91
"	7	25	28	19	17	15	14	13	92
"	8	19	20	17	18	16	15	14	86
"	9	22	24	18	16	15	14	13	83
"	10	16	18½	16	14	13	12	11	64½
"	11	11½	12	11	11	10	9	8	49½
"	12	17	11	14	14	13	12	11	59
"	13	13	16	17	17	16	15	14	65
"	14	10	12	15	15	14	13	12	53
"	15	16½	16½	16½	16½	15½	14½	13½	66½
"	16	9½	11	10	10	9	8	7	41½
"	17	13	8	14	14	13	12	11	48
"	18	10	11	15	15	14	13	12	49
"	19	11	13½	13	13	12	11	10	48½
"	20	14	15½	16½	16½	15½	14½	13½	64

FIGURE 18-- NUMBERS OF TIMES PICTURES WERE
CORRECTLY DISCERNED BY SUBJECTS IN
DIFFERENT GROUPS.

		<u>ALPHA GROUP</u>		<u>BETA GROUP</u>	
PICTURE NUMBER		NUMBER NAMING PICTURES CORRECTLY	PER CENT	NUMBER NAMING PICTURES CORRECTLY	PER CENT
"	5	51	96	39	100
"	6	52	98	39	100
"	7	53	100	39	100
"	8	39	73	37	96
"	9	46	87	37	96
"	10	34½	64	30	77
"	11	23	43	26	66
"	12	28	47	31	80
"	13	29	54	36	92
"	14	22	41	31	80
"	15	33	62	33½	85
"	16	20½	40	21	50
"	17	21	41	27	70
"	18	21	41	28	72
"	19	24½	50	24	60
"	20	29½	60	34½	87

FIGURE 19--PICTURES DISCERNED BY ALPHA AND BETA
GROUPS AND PERCENTAGES.

Illustration Number 8, Cross: This illustration was discerned by 73 per cent of the Alpha group and 96 per cent of the Beta group. The embossed picture was easily deciphered by the Beta group but the Alpha group experienced trouble. The incorrect answers were as follows: "church", "steeple", and "window". One subject was familiar with the Red Cross, which is made in a little different manner, and this confused her. Some suggestions on this picture came from the subjects and were enlightening. One said that he preferred the cross filled with raised dots and the other criticized the distance between perpendiculars, suggesting that if the lines were close together, he could have more easily distinguished the illustration.

Illustration Number 9, Pear: 87 per cent of the Alpha group and 96 per cent of the Beta group distinguished this illustration. Both groups did exceptionally well discerning the picture. The high percentages may be attributed to the statement in the question. The words "local fruit" naturally limits the answers, yet the word "banana" was written in on three test cards. Several called this picture an "apple", evidently failing to feel successfully the contours of the lines. One subject identified the fruit by the "black spot" on the bottom. A girl from Michigan answered in the following enthusiastic manner, "A pear--I like it, it's almost good enough to eat!"

Illustration Number 10, Shovel: This picture was inserted in the test because it was a tool which females probably had not had an occasion to use. Tests, however, show that the female non-sighted were able to name correctly this object and no noticeable difference in the scores was

evidenced. Sixty-one of the ninety-two subjects detected this tool and it was distinguished by 64 per cent of the Alpha group and 77 per cent of the Beta group. Many subjects evidently made a guess as to just what this tool was. Four people called it a "wrench" and three people distinguished it as a "hammer". Among the many tools mentioned were the "plane", "tamper", "tire pump", and "hatchet". A criticism of this drawing was made by one of the persons giving the tests. He suggested that the handle of the shovel was not in proportion with the blade. This constructive criticism was gratefully received and brings up the question of technique of depicting such articles. Very true, the non-sighted person may receive a wrong impression of the articles the picture is trying to show, and pictures of this type probably should not be used until an improved method of producing them has been developed. Another interesting side-light on this illustration is one of the subject's remarks. He said, "I see men carrying them home from work."

Illustration Number 11, Axe: Only 43 per cent of the Alpha group was able to distinguish this illustration. The Beta group also received a lower percentage on this embossed reproduction, it being 66 per cent. Again outside factors enter into the test as the author believes that very few blind people would use an axe and hence it was not distinguishable. On several of the test cards, this fact, that the subject had never seen an axe, was written after the question. That we must be careful in producing pictures for the blind is here concretely shown as four people from widely scattered sections, called this picture a "furnace". Among the answers written in after the question were the

following: "spinning wheel", "chicken", "poker", and "fire place". The handle of the axe projected through the head of the axe. This was noticed before the tests were sent through the mail, and though this is not true in an actual axe, the author did not change the illustration. The error was left to see if any blind person would be keen enough to detect poor assembling. A woodsman from Michigan immediately noticed the mistake and called the tester's attention to it. Criticism of the length of the handle was justly made by two persons connected with the giving of the tests. One of the subjects made the following comments, "It is very good".

Illustration Number 12, Cup and Saucer: This picture, and one other, were drawn in perspective and were inserted in the set. Perspective pictures present a serious problem to the non-sighted and a later chapter will be devoted to this topic. This picture was one of the hardest for the subjects to discern. The Alpha group scored 47 per cent and the Beta group 80 per cent. The cup in the picture was raised in the saucer to make the illustration clearer and this was a mistake, as it is certainly poor psychology to be dishonest in a representation made purposely for the afflicted. If the statement had been omitted, and the persons tested asked to tell what these objects were, without aid, the percentages would have in my judgment, approached zero. Many comments were written on the test cards and among them appeared such statements as the following: "Presents difficulty", "Line inside handle confusing", "Doesn't seem right", "Handle not outside", and "Cup not down in saucer". Sever-

al persons identified the "cup and saucer" as "salt and pepper shakers", "silver", "broken dishes", and sugar bowl". The handle of the cup was placed on the left-hand side and apparently bothered only one person. The writer, in giving the tests to a young college graduate asked him, after the test, if the fact that the handle on the left-hand side bothered him in distinguishing the picture and his answer was, "No, I'm left-handed!" (See Chapter on "Implications" for further comments.)

Illustration Number 13, Mitten: This picture was evidently misplaced in the succession arranged by the author as the Alpha group was able to give the correct answers to 62 per cent of the questions asked. The Beta group obtained 92 per cent on this illustration. The question mentioned "one of a pair and winter" and it was not very difficult to discern the picture when the lines were felt. Several of the non-sighted called this mitten a boot and the outline approaches an imprint of one. A ten-year old boy thought that this illustrated an "ice skate" and this answer was the most foreign to the correct. It was suggested by one of the testers that the thumb was too small, but I hardly believe that this would confuse a non-sighted person.

Illustration Number 14, Umbrella: This picture incorporated a great many lines and it was thought, when the picture was originally drawn, that very few subjects would distinguish what the object represented. The question associated with this drawing was not of the informational type and the correct answer could not have been obtained unless the embossed lines were interpreted correctly. One-half of the Alpha group

answered the question correctly while 80 per cent of the Beta group was able to separate the lines and "see" the umbrella. The handle was the clue that many subjects grasped, and familiarity with canes possibly was the outside factor entering into these comparatively high percentages. Some of the comments written on the test cards in connection with this illustration were: "Open umbrella better", "Below handle looks like an umbrella", "Always used a straight handle", "Too many lines", and "Get it easy". Three people called the picture a "rake" and some of the other answers were: "flower", "hoe", "chisel", "top of pump", "trowel", and "cane". The author has tried this picture on many sighted persons. The individuals were asked to close their eyes and the picture was placed under their fingers and the question read to them. Not a single person was able to name correctly this object.

Illustration Number 15, Shoe: Less than one-half of the Alpha group distinguished this "one of a pair". The illustration presented no problem to the Beta group and 85 per cent knew it was a shoe. The interesting fact connected with this picture was that those who did not know this was a shoe gave no other answer but just said that they did not know. This was the only case where a variety of answers was not received.

Illustration Number 16, Chair: This chair was shown in perspective, and, as with the case of the cup and saucer, the subjects were confused. It was the most difficult picture in the set and only 40 per cent of the Alpha group distinguished what the "object" was and only 50 per cent of the Beta group scored correctly. Unfortunately, the statement in the

question gave absolutely no help for the subject. Described as a conglomeration of lines by many, the foreshortened lines really presented the problem. Many subjects suggested that a side view would have been better. How these lines deceived the sightless may be shown by some of the comments received: "Slats look like windows", "Not a plain picture", "Vague", "Too many lines", and "It is not a Chippendale". The legs were discovered by several as is shown in some of the wrong answers. Three people called it a "table", one a "radio", two a "divan", two a "dresser", and one even saw a "highboy". Mr E.H. Fish, connected with the Perkins Institute for the Blind, comments that the chair was not convincing and the slats could be improved.

Illustration Number 17, Tea Pot: This was one of the most difficult pictures because many of the non-sighted were not familiar with the object, or the design was not similar to the one they were accustomed to using. As was expected, the female subjects scored a higher percentage on this particular illustration. The Alpha group obtained 41 per cent and the Beta group 70 per cent. That there is a danger of a misconception is shown, as the following were some of the answers given to this question: "stove", "buffet", "fish in net", "vacuum cleaner", "baby carriage", and "fish bowl". Looking at the raised lines of the illustration, the sighted can see why some of these answers were given.

Illustration Number 18, Lamp: This drawing also presented a problem to both groups. The diversity in the designs of the modern lamps makes the attempt at showing an illustration very difficult. The blind are not too familiar with lamps and possibly the choice of the picture in the

series was unfortunate. The Alpha group scored 43 per cent and the Beta group 72 per cent. This lamp was called twenty other objects by those that failed to recognize it and one individual called it a "man". The vase part was distinguished by four but the "trapezoid" at the top proved bothersome.

Illustration Number 19, Bird: The statement accompanying this picture gave the subject very little information. Here was an object which few non-sighted people had had in their hands and this was included in the research for this reason. The picture was expected to present difficulties to the blind but the Alpha group obtained 50 per cent on this illustration and the Beta group 60 per cent. It was the next to the most difficult picture for the Beta group but was easier than many of the earlier pictures for the Alpha group. The author can offer no explanation as to why the group that had seen birds sometime in their lives should obtain a comparatively low percentage on this drawing. This illustration again warns us to be careful of the possibilities of misconceptions. One subject called this bird a "moving van" and three non-sighted individuals saw a "Christmas tree". An interesting side-light in connection with this picture is the fact that this bird was "entirely new" to one of the blind girls, and her tester wrote that she was very inquisitive about it.

Illustration Number 20, Cat: This, theoretically, was expected to be the most difficult picture in the set. The research proved that 60 per cent of the Alpha group and 87 per cent of the Beta group could distinguish this animal from the raised illustration. The outline of a cat, not

being too different from a dog, caused eight of the subjects to classify this pet as a dog. A simple thing like the "whiskers" helped many in obtaining the correct answer. Eight of the answers marked incorrect were of other animals such as the tiger, camel, giraff, chicken, and rabbit. This picture was criticized by many and some of the comments were: "Tail too long", "Angle of tail puzzling", "Head and feet too close together", "Too thick for a cat", and "Whiskers do not look like whiskers". Many of the blind probably have cats as pets and hold them in their laps and pet them, passing their hands often over the form of the animal. This possibly helped materially in the high percentages scored by both groups. The writer obtained great satisfaction watching a blind girl feel of the embossed lines of this illustration and finally seeing her feel the "whiskers" and then exclaiming, "It's a cat!"

CHAPTER IV

PERSPECTIVE PICTURES FOR THE BLIND

In early years we sighted people become accustomed to perspective views. At no time in our earlier lives do we concern ourselves over these false pictures, as to us, they seem natural. We look at a building, a street, a railroad track, and hundreds of other objects and see the lines converging and never give it a thought. In our later years, in school, we are taught drawing, and when we try to show pictures of different subjects, we must be taught the laws of perspective. A picture of a drinking glass shows the opening with an ellipse instead of a perfect circle. Railroad tracks are shown converging toward a vanishing point and the legs of animals are foreshortened. The sighted people know that these lines do not actually converge but the picture of these lines have to be shown in that manner as this is how they appear to our eyes. The fact of the matter is that very few shapes appear to our eyes as they actually are.

These falsities cause great concern when we contemplate pictures for the blind. The blind feel objects with their fingers and to them the opening of a glass is always round and the legs of a chair are all the same length. Actually the fingers give a truer picture than the eyes. The problem that arises is how are we going to produce pictures for the blind. Are we going to teach the laws of perspective or are we going to be honest and produce pictures in a manner that all lines will be of the true length? Possibly only outline pictures should be considered and the third dimension forgotten. An evidence of this

distorted idea appears on the test cards used in this research, and if any warning prevailed, in the comments and from the question answers received from the blind people and the workers with the blind, it is the message to beware of perspective. Many of the educators of the blind have attempted pictures for the non-sighted and have had some disastrous results. A few years ago a test was given to a group in Chicago and pictures of farm animals were given to some of the blind children. Later this group was brought to a farm and here they "saw" animals for the first time. Even though this group had felt the pictures, wholly distorted views of the cows, chickens, and dogs were held.

Mr. Waterhouse of Perkins Institute in an unpublished monograph, "Seeing through the Finger-tips", deals with this subject and uses the following illustration to bring out his ideas on perspective. I am quoting from his manuscript, a portion of which he so kindly placed in my hands. "The difficulties involved in instruction of perspective are overwhelming. I have had intelligent students of mathematics in their early twenties who failed to understand a simple demonstration that a circle appears elliptical from most angles. This is simple compared with the task of explaining why a vertical leg appears rarely at right angles to a horizontal table top, or rectangular from a point directly above them. Yet these are about the simplest types of problem involved."¹

The two perspective pictures used in the research conducted were the "cup and saucer" and the "chair". These pictures certainly did present a problem to the non-sighted and they were the two pictures on which the

¹ Waterhouse, Frank J. "Seeing through the Finger-tips." An unpublished monograph.

lowest percentages were received. The opening of the cup and the saucer was shown in perspective. Miss Verall D. Wright of the Chicago Chapter of the American Red Cross carefully analyzed this picture and I am sure others will agree with her in what she has to say. Miss Wright's comments were, "In drawing the cup and saucer-- we all know whether we are sighted or not, that the handle of a cup leaves a space through which to put one's finger. In an outline drawing, the sighted person recognizes this, but to a blind person feeling the flat service, no space or hole is indicated."

Should we try to actually teach perspective to these non-sighted people? Suppose we start at an early age and teach this theory. It will be a slow process. It is an actual fact the the first pictures known to us date back to the Prehistoric Period. Pictures were drawn in the Egyptian Civilization and also in the early Asiatic Civilizations but through these thousands of years no pictures in perspective were made and it wasn't until the Roman Civilization was any attempt made at producing illustrations with an understanding of the laws of perspective. Thus, sighted people learned perspective slowly even though these false pictures were before them every hour of the day.

Many educators of the blind, with this thought in mind, believe that perspective can be taught to these people. The teaching will be a tedious process and will naturally have to start at an early age. Quoting from a letter received from a worker with the blind, "I am sure that there is a place here through which we can bring a great deal of pleasure to the non-sighted; and if we have the patience to develop it

as we should an entirely new subject, (and no one who has not worked with the blind can appreciate what an absolutely new subject it is to them), we shall open up to them an increasingly accurate knowledge of their environment, and so help them adjust themselves by breaking down some of the barriers which set them apart from the world." This worker recommends a new process of education. This will have to be developed and the author has seen attempts in this direction. A woman was teaching perspective to a blind young man and was using a toy balloon for this purpose. The balloon was in the shape of a pig. She had blown the pig up and was walking with the student. As she walked away from a definite point she was releasing the air gradually and trying to show the pupil, whose fingers were on the animal, one of the simple facts in perspective. It is very hard for blind persons to realize that people are not always the same height and can't understand why one should decrease in appearance. This scheme might be practical and it is an attempt in the direction we must take, if we are going to teach perspective.

This thesis does not set out to prove that perspective pictures are of any value, but from the results of the tests, it does show that perspective pictures are more difficult for the blind and indicates possibilities of causing harmful conceptions. Perspective pictures may supply a need for that group blinded in later life, as the principles of this law have undoubtedly been firmly planted in their brains during the years they were fortunate enough to have had their sight. Additional research is needed upon this subject and if new teaching devices

are invented, years of work and testing will be necessary before definite conclusions may be drawn.

The author's study has shown that many workers with the blind have thought about this problem and several suggested that possibly pictures, in perspective could be developed using a different type of lines for all foreshortened or false lines used in the illustration. For instance, in the chair used in the test pictures, Number 16, the back legs and certain lines of the seat would have dotted lines showing that these lines, in reality, were false. A blind college graduate also suggested this to the author when he was giving the test to him. I believe an interesting study could be conducted using this idea, after the laws of perspective had been taught verbally.

In conclusion, the author believes at this time and until further study has been made, that to hand these pictures in perspective to the blind would be a serious mistake, and that grave dangers would result from the misconceptions given. The task is colossal and the practicability of pictures in perspective is problematical.

CHAPTER V

OPINIONS AND COMMENTS OF THE TESTERS AND TESTEES

The embossed illustrations used in the tests were placed in the hands of the blind and the tables in the previous chapter indicate clearly that the blind people are able to discern comparatively high percentages of the pictures. The study also included several questions to be asked the subjects as the writer wished opinions from the people concerned. The research was conducted with the philosophy that even a small contribution made to assist this group would be valuable. The non-sighted persons' opinions proved interesting and worthwhile. On the "Answer Cards" appeared three questions to be asked the subjects tested. The testers recorded the answers and from these certain conclusions might be drawn. The three questions asked were carefully thought out and were purposely made brief so as not to be misinterpreted by any of the individuals. The group tested was of all levels and the ages were from ten to sixty-eight years. Many had been blind since birth and others had been sightless for only a few years of their lives. No attention was given to the intelligence range of the tested persons. The cooperating parties and the writer believe this to be a pertinent factor in the capabilities of the subjects; individuals with the greater intelligence have undoubtedly been more successful in the test. The answers received, on the questions asked, are the replies from the whole group and no attempt has been made to classify the members.

Question Number 1: Have these illustrations been of any interest to you?

<u>YES</u>	<u>SOME</u>	<u>NO</u>	<u>BLANK</u>	<u>TOTAL</u>
82	2	6	2	92

About 90 per cent of the subjects indicated that they were interested in the idea of embossed pictures. Many of the subjects had never "seen" illustrations before and were keenly interested and commented to that effect. 83 per cent of the "No" answers came from one institution, and the reason for this high percentage could not be tactfully ascertained by the writer. Some of the subjects had felt raised lines before, as they had been used in teaching geometrical figures to the non-sighted. In some sections of the country blind persons had been brought in contact with illustrations produced by using raised dots instead of raised lines. (See Figure 6.)

The blind, themselves, are evidently interested in the idea of embossed illustrations and this high percentage leads the writer to believe that such manifestation shows the value of the idea. True interest, in itself, does not necessarily prove that from an educational standpoint there is value, but it certainly is a motivating factor, if we are considering means of providing additional enlightenment for these unfortunates. A girl's remarks on the test card brings out this point rather forcibly. She exclaimed at the end of the test, "Oh, gee. Is that all!"

Brailled books are cold and devoid of illustrations. Are the blind satisfied with their literature or would they like, if possible, their books transcribed and also illustrated? Any additional means of making their pleasures, their actions, and their living parallel that of the sighted is

deeply appreciated by these handicapped, and it was with this thought in mind that efforts were made and this question asked.

Question Number 2: Would you like a brailled book illustrated with pictures? A history book for instance might be augmented.

<u>YES</u>	<u>PERHAPS</u>	<u>NO</u>	<u>TOTAL</u>
67	5	20	92

Here the percentages show that though 90 per cent was interested in the idea of illustrations, only 73 per cent would like their brailled books supplied with illustrations. The reason why about 20 per cent did not want their books illustrated was given and many felt that the lines, being read, would be lost and the train of thought would become confused. This criticism should be considered when books are being prepared for the non-sighted, and pictures placed at previously-determined places in the text. The problem of illustrating books is somewhat involved, and new techniques will have to be developed to overcome this objection. An analyses of the replies does indicate that the blind, themselves, would like their books illustrated and the method of doing it in a practical manner is a challenge to the interested workers.

The question of aesthetic value was raised by an elderly, non-sighted woman in Tewksbury, Massachusetts. She made the statement that she could receive a great deal of pleasure sitting down and feeling these embossed pictures. This woman had had her sight for a period of years and she compared the pleasures she obtained, feeling the pictures, to that received by a sighted person studying and admiring an interesting photograph or painting. This woman would actually sit by the hour with one of

these embossed illustrations and carefully feel the lines and allow her mind to wander, recall stories, and visualize the picture in connection with imaginary happenings. From the expression of her face and from her comments the sighted observer, in wonderment, realized that these slight efforts might add to the enjoyment of the non-sighted. The next question was asked with this value in mind.

Question Number 3: Could you get any pleasure sitting down and feeling pictures if they were made interesting?

<u>YES</u>	<u>NO</u>	<u>QUESTIONABLE</u>	<u>NO ANSWER</u>	<u>TOTAL</u>
57	19	6	10	92

This question was hypothetical in nature but I believe it serves as a means of indicating additional value in these raised illustrations. 60 per cent would like to have a set of pictures to peruse at their leisure. The twenty test pictures used in this research were donated to the institutions and the organizations cooperating, and since the tests were given, several individuals, who had taken the tests, have requested sets of their own, as they desired to feel them for longer periods of time. The author feels sure that research will produce pictures that will fulfil the desires of this 60 per cent, and in time, a series of pictures might be arranged that will be to the blind people what famous paintings, etchings, and prints are to the sighted.

Additional Comments of Testees: On the test cards space was allowed for suggestions. The author intended to obtain the reaction of this non-sighted group to the embossed illustrations. The tested individuals were asked to make comments and suggestions. The information received

from the tested group contains some important recommendations and in most cases was very constructive. Many of the pictures were too complicated, according to the blind people taking the tests. Many desired simpler pictures and fewer lines. Some thought that unnecessary detail could be eliminated and a greater care taken in spacing the lines. Several subjects made these suggestions: "Make pictures truer to facts", and "Beware of perspective". Only one person in the group made a comment which might be considered negative. Her opinion was, "Too much work finding out what they represent." Subjects took this opportunity to show their interest in the study and encouraging words were given. Some of the remarks made by the blind were as follows: "These pictures seem all right to me", "Pictures if they are explained more fully will be understood", "Illustrations of things you read about make reading matter more interesting", "If we had more pictures we would be familiar with objects and how they appear", and "Gradual series of pictures coming up to such complicated pictures would aid us".

Comments of Testers: The individuals, who gave the tests, connected with the organizations and institutions, were also requested to give their frank opinions of the value of these illustrations. Though a high percentage of the non-sighted people could see value in these pictures there was a diversity of opinions received from the sighted persons. The group which gave these tests were all workers with the blind and connected with different educational or service bodies all over the eastern section of the United States. Many considered the illustrations impractical and

commented to this effect while others were enthusiastic and believed the idea excellent. The negative comments were as follows: "Common drawings impractical", "Objects too difficult to distinguish", "I don't think it is of much value", "They would get disturbed impressions", and "Simplicity is the keynote of all embossed work". The parties that stated that this idea had little value were in the minority and the greater number believed the illustrations were of value and desired the work be continued to the point where books would be produced for general usage. The comments made by the testers in favor of illustrations are given so that the reader may weigh the same against those with opposite views. These are direct quotations from the test cards: "A splendid idea", "Good if not complicated", "I think it is excellent", "Most interesting and worthwhile", "Would aid greatly to their enjoyment of stories", "Miss B. is a teacher and she feels the children haven't enough pictures", "Good idea but much care will be necessary in simplifying and explaining the pictures adequately", "Think idea good. However, the pictures will have to be simplified if they are to give the reader pleasure", and "Continue your study as it will prove very worthwhile for these unfortunates".

CHAPTER VI

SUMMARY AND IMPLICATIONS

"And wisdom at one entrance quite shut out.
So much the rather thou Celestial light
Shine inward, and the mind through all her powers
Irridiate, there plant eyes, all mist from thence
Purge and disperse, that I may see and tell
Of things invisible to mortal sight." ¹

The main purpose of the tests was to discover the value of embossed illustrations. Illustrations of many types had been used in the past, and varied, ingenious schemes had been invented for producing pictures. Simple embossed objects on greeting cards had been introduced to the non-sighted, but the use of the full lines had been restricted to simple geometric figures. The author has found no evidence of any book or article illustrated with pictures, and the first attempt seems to be the primer published by the Springfield, Massachusetts Chapter of the American Red Cross.

The test cards, as a whole, provided an interesting study and the author has drawn the following conclusions from the total results of the tests.

Illustrations for the blind have great possibilities. Even the so-called difficult pictures could be discerned by a large percentage of the group and discernment certainly gives conceptions to the blind. A few workers with the blind seem to think that disturbed impressions may be received but the writer's opinion is, that this is a matter of education. The test had a drawback in that, in many cases, these pictures were placed

¹ Milton, John. Paradise Lost.

before the non-sighted with very little preliminary preparation. Twenty pictures, gradually working up to extremely difficult illustrations are no criteria of what these blind people could do if a scientific study of the problem was made and a larger set of pictures devised to teach these non-sighted the idea of illustrations. The learning of braille in many cases requires years of study and is taught at an early age. What will have to be done is to simplify the illustrations and actually teach their usage exactly as we teach braille and other subjects. The level for teaching these illustrations is apparently in the early years, as children seem to have the faculty of grasping the idea better than older people. This, of course is due to the imagination of the younger group and to their receptabilities of new ideas. The teaching of these illustrations will have to be done in a patient manner and the pictures will have to be taught in conjunction with real objects and the brailled text. The outline pictures will necessarily remain simple for a long period of time and such pictures as the "bird", "shoe", "cat", etc. would not be presented to the non-sighted person until several years had been spent on the easier embossed pictures. In other words the pictures must be taught and the complexity of same made dependent on the different levels of learning. Perspective pictures need not be introduced to the non-sighted if studies prove that these can't be conceived, but the tests do indicate that they can be recognized and the fact that they cause disturbed impressions must be definitely proven if such is the case. The author of this thesis

believes that some method can be derived for teaching the laws of perspective to these non-sighted. The proof of this statement can only be obtained after a long period of instruction and the development of the mechanics of teaching this embossed-line idea.

The Beta group, made up of members who had been fortunate enough to have had their sight during some period in their lives, did discern higher percentages with the test pictures and in future studies, pictures and techniques of a special nature will have to be developed for these persons. The problems of the Alpha group and the Beta group are distinctive and these groups should be separated for the teaching methods will have to be handled in a different manner.

The procedure of feeling the embossed lines presents another study. The braille dots are generally felt with one finger of one hand. The sensitiveness of this finger is developed to a high degree. In giving the tests the author watched several subjects. Practically all the blind observed, used this sensitive finger to "see" the pictures. Two of the older people, one a college graduate who had been blind since birth and an elderly man who earns his living caning chairs, used different methods. They felt the pictures using the fingers of both hands and seemed to grasp the illustrations quickly. Both these subjects were able to discern all the pictures in the set with little effort. Studies in this direction will have to be made and the feeling of larger pictures will have to be taught in a different manner than the feeling of brailled dots.

The use of questions in connection with the pictures was criticized by a few testers. They thought the questions were Socratic and the subjects were only able to distinguish the pictures because the questions asked gave them clues. The author, in setting up the test, tried to make it parallel the conditions under which these illustrations would be used. The detection of these pictures was not intended to be a puzzle problem. Illustrations in a book would certainly be given some clues from the text and it was with this in mind that the questions were used with the various pictures. Questions on Pictures 16 and 18, however, did not assist the subjects and low percentages of discernment were the result. The aim of these pictures is to supplement the information brought to the blind through braille and the reading matter naturally will be closely related to the pictures used.

The methods of producing the raised illustrations needs revising as the present system provides many difficulties. In using the stylus, the method described in the earlier chapter, the problem of knowing where to press the paper into the depressions cut into the linoleum is entirely unsatisfactory. When the braille paper is put over the linoleum block, the carvings into the composition cannot be seen. At the present time the only way of knowing where to press the stylus is to rub the tool over the paper gently and the picture will appear in the same manner it would if you put a penny under a piece of paper and used a pencil to bring up the design by drawing the pencil over the paper. Some means of bringing the figure to the back of the braille paper presents a problem for further research.

Summarizing the Findings: We are dealing with an entirely foreign problem as far as previous knowledge of illustrations are concerned. Research in this field has been neglected. Many barriers and dangers are encountered and for some of the non-sighted the problem will never be solved. Embossed illustrations may, however, relieve distorted views of certain groups. There are indications that children and individuals of average intelligence may have their knowledge of their environments increased when the idea of embossed illustrations is scientifically developed.

Suggestions for Continued Research: The research in this field is limited and the author feels that the idea is of value and recommends further study of the many problems which have arisen from this preliminary research. The major controversial questions are here conveniently listed in the hopes that at some future period, complete and definite answers may be found and the non-sighted benefited.

1. Continue this study along similar lines but increase the numbers of subjects contacted so that the results may be classified more definitely according to different groupings. These groups should include members classified as to intelligence, ages, sexes, periods of blindness, and any other classification thought advisable. The idea of the pictures should be taught for stated periods of time and then tests regiven to afford comparisons.

2. Many subjects thought the pictures would be better if dots were used instead of lines. Tests using pictures made with dots and identical pictures made with embossed lines should be developed. These should be placed in the subjects' hands and research conducted as to which is the

more practical.

3. Some illustrations require a great many lines and this has proved bothersome to some of the subjects. There is a possibility of reducing the numbers of lines in many pictures while still conveying the idea. A study along this path would be interesting and if successful would eliminate the complexities of such pictures as the "chair" and the "umbrella".

4. It is evident from this research conducted that illustrations will have to be designed for different groups. People blind from birth probably should have an entirely different set of pictures. The embossed lines will have to be made so different groups may discern them and the level of the reading matter will not necessarily parallel the pictures used to illustrate.

5. Observations have proven that there are different methods of feeling the pictures. There is a tendency for braille readers to feel the pictures as they would feel the brailled dots. Different techniques should be tried and then tested to see if there is a method which might be considered standard. The tests indicate that possibly the both hands should be used for feeling such objects as the "lamp", "chair", "shovel", etc.

6. The method of embossing the pictures is not wholly satisfactory even though practical. Research should be continued and other methods tried. The level must be kept at the point where it is in this thesis, as the volunteers who do the transcribing are not able to use a method

which requires expensive machinery or technical skill. The process described and used in making the pictures in this research is the limitation necessary for these volunteers but processes should be invented so that the illustrations may be made on the letter press and commercial printing presses.

7. The possibilities of perspective pictures for the non-sighted are unknown. This study shows that a surprisingly high percentage of both groups discerned the two perspective pictures yet many testers and testees wrote, "Beware of perspective pictures". Perspective must be taught to the non-sighted and some unique plan will have to be discovered. The process will be long and tedious and the question is, is it worthwhile to put this effort into it. Outline, two-dimension pictures may be sufficient and perspective pictures forgotten. Experimentation in connection with perspective pictures should include the idea of foreshortened lines being represented by some other method than the usual embossed lines. The people having their sight at some period may derive benefits from perspective pictures and the individuals blind since birth may never be able to learn that pictures are sometimes false in appearance. Conflicting opinions occur relative to perspective and a scientific research would be of great value.

8. Some of the subjects suggested that the objects illustrated should be filled with dots. Another suggested that the stripes on the American flag, when illustrated, should be cross-hatched to show the different colors. There is a possibility in these suggestions and the author's

attention was drawn to a circumstance demonstrating the value of mass embossing. The Red Cross Chapter of Springfield, Massachusetts made an embossed picture of a frog beside a stone. The picture was in outline and the non-sighted were confused because the stone was in real life hard and the frog soft. The workers then embossed the full stone to emphasize the difference and the picture received a better reception. A study of illustrations with the idea of showing physical make-up of the subjects represented might prove of value.

9. A study of what types of pictures should be used in illustrations must be made as there is a tendency to make the pictures too difficult. One chapter of the American Red Cross has attempted to use raised dots for illustrating and several complaints have come to the author relative to these illustrations as they were so complicated that sighted persons could hardly tell by looking at them what the pictures were supposed to represent. This idea has its limits and these limits should be determined definitely so that the users will not meet with a picture that might discourage further usage.

10. The placing of illustrations in a book is important. The reader of braille must remove his hand from the line he is reading to "look" at the picture. Just where to place the picture in relation to the reading matter presents a problem, as the content of the reading matter might be lost if the fingers are drawn from the braille at poorly planned intervals.

11. Eventually illustrated books will have to be placed into the hands

of the blind. A study will have to be planned after these books are available. A test using some educational textbooks with and without illustrations should be planned. One group of blind students should be taught with the text without pictures and one group with the book with illustrations. The teaching should be done over a period of time and then the two groups tested to discover if the group with the illustrated books had obtained a better or poorer understanding of the material than the other group. These two groups would be paired so that no outside factors would enter into the experiment and the only variable would be the differentiated textbooks.

12. The aesthetic value of these pictures should be studied. The writer, in several instances, has seen evidence that illustrations of this type may bring new interests to the blind. Many of the testees stated that they would like to have these pictures to "look" at and would get enjoyment out of them.

13. These pictures might be used for recreation of the blind. The idea of embossed lines, made by the process described, has been put to use in Springfield, Massachusetts and the blind persons have been able to play "Beano" on cards using this idea for the embossed sections. In the tests conducted by the author many persons tested mentioned the fact that they received enjoyment puzzling over some of the more complex pictures.

14. The blind are able to transcribe material into braille. Studies should be made to discover if there are any possibilities of the

blind, themselves, using this process and making pictures. If the process can be organized so that the non-sighted are able to do the operations, these pictures will have their values enhanced.

APPENDICES

- I TEST PICTURES
- II TEST CARDS
- III LIST OF INSTITUTIONS AND
ORGANIZATIONS COOPERATING
IN THE RESEARCH



APPENDIX I---TEST PICTURES.





















1871















APPENDIX II--TEST CARDS

"Illustrations for the Blind"

Answer Card for Test Pictures

(Use one of these for each subject tested)

Data Necessary for Study

Institution or Organization Giving Test

.....

Subject's First Name

Age in Years

How Many Years a Braille Reader?

Non-sighted for What Period of Time?

Ralph W. O'Rourke
Buckingham School
Springfield, Massachusetts.

Research conducted under the direction of the Graduate School of Massachusetts State College and with cooperation of the Springfield Chapter of the American Red Cross.

Picture No. 1. Place subject's finger on line, and explain to him or her that this is an embossed straight line.

Picture No. 2. Place subject's fingers on these two lines, moving from one to the other, and explain that these are two straight lines.

Picture No. 3. Trace this line with the testing person's finger, explaining that this is a curved line.

Picture No. 4. Follow with subject's finger these attached lines explaining that this represents a curved line joined to a straight line.

Using pictures 5 to 20 inclusive, the subject should try to decipher pictures shown. Person giving test will hand the card to subject, read the question asked for each picture, and record the subject's answer on the line below that particular question. *All* answers should be recorded, even though the individual's answer is entirely incorrect. Wrong answers often provide interesting information and will greatly aid the research.

If the question or statement is not clear, the tester may give definitions or explanations of bothersome words. Clues to pictures should not be given, however.

Picture No. 5. A farmer has a square plot of ground and has a certain part enclosed. The lines embossed on this card represent the fenced-in section. How many sides are fenced in?

Picture No. 6. The lines embossed on this paper represent how many sides of a square?

Picture No. 7. The figure represented by this illustration is a common figure used in mathematics. Can you tell what this figure is or how many sides it has?

Picture No. 8. This figure represents a very common religious symbol. What is it called?

Picture No. 9. The outline in this picture represents a local fruit. What is it?

Picture No. 10. The tool depicted in this illustration is very often used by laborers. What implement is it?

Picture No. 11. Every home used to have one of these, and many are still found in the cellars of residences. What does the picture represent to you?

Picture No. 12. These are found on the table at mealtimes. What are these closely associated pieces called?

Picture No. 13. This picture represents a part of the wearing apparel used by all boys in winter. What single item of a pair does this attempt to show?

Picture No. 14. This illustration shows a necessity in the spring. Can you distinguish what it is?

Picture No. 15. This drawing shows one of a pair. They are called what?

Picture No. 16. What is this object called?

Picture No. 17. This article is found in every home and most women are familiar with it. The illustration shows it to be a what?

Picture No. 18. This object is more difficult to distinguish. It appears to be what to you?

Picture No. 19. This, with others, brings us cheer and is important to us. The figure, as drawn, represents what to you?

Picture No. 20. What animal do these embossed or raised lines try to show?

(Important Questions on Next Page)

QUESTIONS TO ASK PERSON TAKING TEST

1. Have these illustrations been of any interest to you?
2. Would you like a Brailled book illustrated with pictures? A history book for instance.
3. Could you get any pleasure sitting down and feeling these pictures, if they were made interesting?
4. We are attempting to bring additional information and pleasure to thousands. Have you any suggestions to offer?

QUESTIONS TO BE ANSWERED BY PERSON GIVING TESTS
(Answer on one sheet only.)

1. What is your frank opinion of the idea incorporated in this research?
2. The process of making these pictures is very simple and this set of pictures was embossed in 60 minutes. No expensive machines are necessary and the materials required may often be obtained at no cost. Would you like to know how they were produced?
3. This is a thesis and will be published in triplicate for the college sponsoring same. Possibly it should be published in some periodical read by the workers with the blind. What magazine would you suggest?
4. The findings of the research may prove negative. At least we have information for future research. Would you care to comment?

Signature of person giving test

LIST OF COOPERATING INSTITUTIONS AND ORGANIZATIONS

Works Progress Administration Project 14,492. Perkins Institute,
Boston, Massachusetts.
Springfield, Massachusetts Chapter of the American Red Cross.
Assumption Braille Associates, Ansonia, Connecticut.
Brockton, Massachusetts Chapter of the American Red Cross.
Blind Players Club, Suffern, New York.
Michigan School for the Blind, Lansing, Michigan.
Connecticut School for the Blind, Hartford, Connecticut.
Class for the Visually Handicapped, Garfield, New Jersey.
Western Pennsylvania School for the Blind, Pittsburg, Pennsylvania.
Works Progress Administration Project, American Red Cross, Springfield,
Massachusetts.
Perkins Institution, Watertown, Massachusetts.
Public Schools, Newark, New Jersey.
Yonkers, New York Chapter of the American Red Cross.
Maryland School for the Blind, Overlea, Maryland.
Indiana State School for the Blind, Indianapolis, Indiana.
Newark, New Jersey Chapter of the American Red Cross.
New York State School for the Blind, Batavia, New York.
Chicago, Illinois Chapter of the American Red Cross.
St. Joseph's School for the Blind, Jersey City, New Jersey.
Detroit, Michigan Chapter of the American Red Cross.
American Foundation for the Blind, New York, New York.
Division of the Blind, Commonwealth of Massachusetts, Boston, Massachusetts.
Glen Ridge, New Jersey Chapter of the American Red Cross.
Junior League of Youngstown, Ohio.

APPENDIX III

ANNOTATED BIBLIOGRAPHY

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This manual is used in teaching braille to the blind and is published for the workers. The pictures and braille alphabet were taken from this manual.
- Christman, Jean. "Construction of Maps for the Blind." Wilson Bulletin, October, 1935.
An article about making maps with different threads.
- Federal Census Report for 1930.
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- Futterer, Susan O. "Braille Maps." School Life, November, 1936, Page 74.
An article on hand-copied braille with facts about available books.
- Milton, John. "Paradise Lost."
- Rich, Frank M. "Comments on Raised Illustrations." School Arts Magazine, May, 1936.
Mr. Rich feels that embossed pictures using raised dots or lines have no value. He advocates applique pictures using different fabrics.
- Springfield Republican. "Maps Permit Blind to Tour City." May 24, 1937.
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- Springfield Republican-Union. February 7, 1938, Page 7.
An article about Mrs. Everatt E. Thompson finishing brail-ling a volume of poems. The picture accompanying article was used.
- Waterhouse, Frank J. "Seeing through the Finger-tips." An unpublished monograph.
This paper takes up perspective and Mr. Waterhouse believes the perspective can never be made practical for the blind.
- World Book Encyclopedia. Volume II, Pages 792-794.
The history of braille is concisely written in this volume.

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