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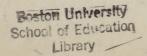
THE EDUCATIONAL INFLUENCE OF THE TYPEWRITER
IN THE ELEMENTARY SCHOOL

Submitted by

Eleanor Elizabeth Mahoney
(B.S., Teachers College of Connecticut, 1944)

In partial fulfillment of requirements for the degree of Master of Education 1945

First Reader: Helen B. Sullivan, Associate Professor of Education Second Reader: Helen A. Murphy, Assistant Professor of Education



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The writer wishes to express her sincere appreciation and thanks to Dr. Helen Blair Sullivan for her unfailing kindness.

She is also indebted to Miss Geraldine A. Dowd for her efficient and cordial cooperation in the conduct of the first grade study; to Genevieve L. O'Mara, Alice D. Seery, and Anna C. Donovan for their valuable suggestions; to the Educational Research Bureau of New York for informational materials.

To her dear mother she is deeply indebted for continued encouragement.

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CHAPTER I INTRODUCTION

It is universally accepted in theory that the school exists for the child. It is vital to the preservation of our way of life that the practices in every school in our land be consistent with this belief. The elaborate and expensive system of public education is justified only if it results in giving every boy and girl an opportunity to develop according to his own specific ability.

Effective school programs are making use of a variety of media to develop initiative, independence, and creativeness in children with the idea of making democracy a living thing in the school rooms of America. Research has done much by way of materials and techniques to assist teachers in studying individual differences, analyzing pupil needs, measuring pupil progress, and providing the necessary tools to make learning hygienic and economic.

The writer, while humbly endeavoring to apply the results of these research findings in helping individual children to progress as fast as they were able with satisfaction accruing, has felt the need of some specific help in facilitating the written expression of children, eager and ready to express themselves orally. These same

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children, confronted with pencil and paper, were baffled, and under specific urging, produced a slow moving, unsatisfactory product far inferior to their oral expression. The fatigue resulting from handwriting in the early stages, due in part to the teacher standard of perfection in the formation of letters and the small muscle activity, adversely affected the product. How can one get around this problem was the question. Adults today avoid handwriting to a great extent and use a typewriter. How about using the typewriter on a fairly large scale throughout the elementary school?

As a result of this train of thought, the writer undertook the interesting task of finding out what use has been made of the typewriter in the elementary school. Following is a summary of the experimental studies that have been made on the use of the typewriter in the elementary schools.

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CHAPTER II

SUMMARY OF PREVIOUS EXPERIMENTAL STUDIES

Most important of these studies was the one conducted by Dr. Ben Wood of Columbia University and Dr. Frank Freeman of the University of Chicago. Wiggam summarizes the experiment: "Drs. Wood and Freeman decided to investigate various statements, made by both educators and business men, about how greatly the typewriter helped children in learning. Being scientists, they felt that these statements, if true, should be backed by scientific experiment, and if false should be proved to be so. The four leading manufacturers of portable typewriters agreed to furnish the necessary money, - several hundred thousand dollars, and to lend 2,100 portable typewriters, to settle the matter for once and for all. typewriters were distributed to thirty schools in eight cities, widely separated, in order to secure an accurate cross section of American school children. In each city. some schools were selected as Experimental Schools, where typewriters were used, and Control Schools, where they were not used. The experiment lasted two years, and a third year

^{1/}Wiggam, A. E., "Children at the Typewriter", School and Society 49:212-214 February 18, 1939.

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was consumed working up the results. Children from five to twelve years were involved. The Experimental and Control groups were matched as evenly as possible in age, ability, class standing, home backgrounds, and given teachers of equal qualifications. The sole idea was to arrange two groups that would differ in only one respect, - one would use typewriters and one would not."

A digest of the study notes the type of data obtained.

"It was recognized from the beginning that no one type of evidence would be adequate for judging the influences of the typewriter. Consequently, data, differing widely in character, were obtained from the following four sources:

- 1. Standardized and special tests of mental ability and school achievement were given both the Experimental and Control Children at various intervals during the investigation.
- 2. Very complete collections were made of all the writings, both typed and handwritten, which were done by both the Experimental and the Control Children.
- 3. The direct observations of the Experimental teachers as to the effects of the typewriter were carefully recorded.
- 4. The children in the Experimental classes were asked to state their attitude toward the class-room use of the typewriter."

^{1/ &}quot;A Digest of an Experimental Study of the Educational Influences of the Typewriter in the Elementary School Class-room.". Monograph issued by the Typewriter Educational Research Bureau, New York, p. 5.

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Specifically, the investigators sought to answer these questions:

- 1. Does the typewriter serve as a stimulus to the pupils?
- 2. What effect will it have on the quantity and quality of their handwriting?
 - 3. Will its use increase or decrease the total output of all writing?
 - 4. How will the typewriter affect the learning of the subjects commonly taught in the elementary school?
- 5. What will be its effect upon the general atmosphere of the classroom?

Tests at the end of the first year, according to Wiggam showed average percentages of gains of Experimental children over the Control group to be roughly as follows:

Reading...... 9% Literature......14%

Spelling.....23% Language Usage......38%

Geography 19% Arithmetic Computation ... 31%

Wiggam further quotes Dr. Wood as saying, "There were two results even more important than improvement in mastery of school subjects; first, the release and stimulus which the ease of writing on the machine gave to the child's powers of expression; and, second, the improved attitudes toward school work in general."

In an experiment undertaken at the Horace Mann School,

^{1/} Op. cit. p. 213

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Conard sought to make a comparison of the influence of manuscript writing and of the typewriter on learning in the class-room. She states, "It appears that the typewriter is influential in developing the children's creative writing, does not affect handwriting detrimentally, but appears to stimulate both quality and speed in handwriting, and has a minor influence on other subjects."

Unzicker attempted to find out the effect of the typewriter on beginning reading. Because of the interest shown
by the communities which participated in the Wood-Freeman
study, these same communities were chosen by Unzicker for
her experiment. The plan for teaching typewriting in first
grade, formulated by Dr. Haefner, was given to the teachers,
while at the same time stress was laid on the fact that the
instrument was an "instrument of expression." The results
of this study show that the beginning reading of children
who do typewriting is slightly superior in every noticeable
respect to that of children who do not use typewriters.

^{1/} Conard, Edith U., "A Study of the Influence of Manuscript Writing and Typewriting on Children's Development", Journal of Educational Research 29:254-265, December 1935.

^{2/} Unzicker, Cecelia E., An Experimental Study of the Effect of the Use of the Typewriter on Beginning Reading, New York: Bureau of Publications, Teachers College, Columbia University, 1934.

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struction in reading and language in the intermediate grades was studied by Tate. Teacher comment on the results of this study was to the effect that "the experimental group showed noticeable improvement, much greater interest in school work, and more satisfaction with their progress. The interest seemed to increase steadily."

After studying the experiment of Wood and Freeman, 2/Cooper became convinced that certain basic principles of habit formation had been violated. She began to teach a group the touch typing method. The conclusions drawn were:

- "1. There is no nerve or eye strain.
 - 2. Small children develop the touch habit almost as quickly as high school pupils.
 - 3. Primary pupils learn to write words and sentences more quickly on the typewriter than by hand.
 - 4. Writing, arranging, and filing typing papers in a neat, orderly way develops systematic habits in which a child takes pride.
 - 5. Typing helps a child in all other school subjects and is closely integrated with them.

^{1/} Tate, M. W., "Use of the Typewriter in Remedial Reading and Language." Elementary School Journal 48:481-485, April 1943.

^{2/} Cooper, O., "Teaching Small Children To Type", Nation's Schools 18:23-26

Participated to the state of the best of Thing? No to being the Allegarian of the brack of the first of the section of the section of . The state of the Control of the second s

6. It appeals to a child'smechanical instinct and he learns it quickly and well."

A similar attack on the Wood and Freeman method of teaching provoked another experiment in Woodstock, Illinois.

Colahan sets forth the objectives:

- "1. Typing was to be taught in a formal class, not used as a toy.
- 2. An experienced teacher was to be used in place of the regular teacher.
- 3. The touch system was to be taught.
- 4. Standard machines, rather than portables, would be provided.
- 5. A classroom was to be equipped and the children brought to it."

The experiment resulted in "adequate achievement in typewriting and a gain in achievement in all branches of learning, added interest in school on the part of the pupils and affirmative reaction on the part of parents. This reaction showed itself in the purchasing of typewriters for home use and the general demand by the parents that typewriting be taught to all children." The experiment proved to their satisfaction that the teaching of typewriting is a

^{1/}Colahan, W. J., "Typewriting Enters the Grade School", Nation's Schools. 16:22-23, December 1935.

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valuable addition to the elementary school curriculum. "The touch system should be taught, the children cas use it, and to allow them to use any other system would be to build up faulty methods which, in later years, would have to be broken down before the touch system could be taught."

Both the Cooper and Colahan experiments to prove the advantage of touch typing may be refuted by the statements of several other people. These people urge that typing be considered not as an end but as a means. Reynolds states, "At no place in the elementary school does the idea of training typists ever appear. That is left for the vocational class of the high school." Haefner points out that "a formal method would also tend to postpone considerably the prepation of the large amount of legible but spontaneous writing which the machine makes possible." Wiggam mentions, "In one city the objection was raised that this would be a drawback in learning touch typing later on. But a special experiment disclosed that pupils who had one year of typing by the 'hunt and peck' method learned touch typing much more

^{1/} Op. cit.

^{2/} Op. cit.

^{3/&}quot;The Typewriter-An Aid to Self-Expression" (Reprint of article Issued by Rollo G. Reynolds from Child Welfare.) Monograph issued by Typewriter Educational Research Bureau, New York.

^{4/}Haefner, Ralph, The Typewriter in the Primary and Intermediate Grades, New York: Macmillan Company, 1932.

^{5/} Op. cit.

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rapidly than pupils of the same age and grade who had never used the typewriter." Unzicker, in her experiment with first grade children, states that "first grade children should be held to no higher standards of performance than their experiences and physical maturity would allow."

Haefner refutes the statement of Cooper and Colahan when he claims:

- "1. The elementary school is not concerned with producing finished vocational skills, leaving such training to high school and college.
- 2. Elementary school children are not adults, either physically or mentally, Adult physical strains and attention spans are still beyond the resources of most children.
- 3. The use of the machine must be adjusted to the condition that elementary school pupils are immature physically, psychologically and socially. No values will derive from setting up typing standards of 'correctness' based on achievements of high school pupils."

Haefner further states, "Most children are quick to respond to the typewriter as an ingenious mechanism and are eager to use it for the basic purpose it serves, - a means of rapid, clear and easy writing. Second, it may be asserted that purely random typing - 'hunt and peck' is unnecessary in the

^{1/} Op. cit. p. 58

^{2/} Haefner, Ralph, "Teaching Typing in the Grades", Nation's Schools 17:22-24, April 1936.

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elementary school. Well-conceived practice materials, possessing intrinsic educational values, will enable young children to acquire a substantial mastery of the fundamental typing skills. Finally, elementary school children can acquire a set of typing habits that will provide an adequate basis for any later systematic use of the machine. But an approach to touch technique should be considered the top of the instructional staircase. Many need not make the entire ascent, their personal requirements being satisfied by a moderate degree of skill."

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CHAPTER III

INFLUENCE ON SUBJECT MATTER

Reading. -- The influence of the typewriter upon reading is summarized by Wood as follows:

- "1. The typewriter creates a 'felt need' for reading.
 - 2. The typewriter improves silent and oral reading.
 - 3. The typewriter stimulates wider reading.
 - 4. The typewriter facilitates teachers' supervision of language."

A digest of the same study states: "Even the very young children are able to write the letters of the alphabet, and some words and sentences, before they know the letters, and long before they can read the words and sentences. In this fact most of the teachers find a genuine and natural motivation for learning to read."

"In ability to recognize small differences in shapes of words children who typed for a year were found superior to those who wrote entirely by hand. Thus typing aids young children in enlarging their understanding of the detailed characteristics of words - a fundamental skill in accurate

^{1/} Wood, Ben D., Freeman, Frank N., An Experimental Study of the Educational Influences of the Typewriter in the Elementary School Classroom, New York: Macmillan Company, 1932, p.112-6

^{2/} Op. cit. p. 13-14

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reading. While typing the word "man" a score of times, pupils became intimately acquainted with the word's peculiar shape, or gain an accurate "perception" of it, to use the psychologist's term, just as a motorist learns a road's twists and turns by much traveling over it." In another article. Haefner calls to our attention the fact that "low quality reading may in part be due to halting and jerky movements of the eyes in looking across the page. Children who typed during the first grade were observed by their teachers to read with more fluency, better expression, and greater smoothness than those who wrote by hand. The reading of first grade children with average or less than average ability was thus definitely aided by the typewriter - a fact worth consideration when remedial devices for dull children are chosen."

Stuart also agrees when she says, "The reading of first grade children in the lower ranges of intelligence was aided most by the use of the typewriter."

^{1/} Haefner, Ralph, "Typewriter and the Three R's", American School Board Journal 95:28-30 September 1937.

^{2/} Haefner, Ralph, "Influence of the Typewriter on Reading in the Elementary School", Elementary English Review 13:291-4 December 1936.

^{3/}Stuart, Cecelia U., "Effect of the Use of the Typewriter on Beginning Reading", Journal of Business Education 12:20 March 1937.

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In her study of the use of the typewriter on beginning reading, Unzicker found that "in everyday reading the pupils as noted by the teachers, it seemed evident that the Experimental pupils read with more fluency, with better expression, and with smoothness - a fact which indicated the presence of a larger eye span; more instances of wordy, jerky reading were noted among Control pupils."

Spencer found that the use of the typewriters, especially in grades 4, 5 and 6 has a great influence upon the pupils' ability in reading as measured by the Gates test of Word Meaning. Also it was shown that pupils who use typewriters in the intermediate grades grasp the total meaning of what they read better than those who did not have typewriters.

No appreciable gain in reading in the primary grades, as measured, was noted. The greatest influence on the improvement of reading abilities was shown in the upper grades.

^{1/} Op. oit. p. 90

^{2/} Spencer, Herbert Lincoln, An Experimental Study Showing the Relative Influences of the Typewriter on the Various Phases of Reading Ability Among Elementary School Pupils. Unpublished Doctor's Thesis, University of Pittsburgh, 1934.

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Haefner concludes:

- The typewriter influences reading in the following ways: (a) by providing a clear perception of words. (b) by facilitating extensive reading. (c) by stimulating reading interest.
- For kindergarten and first grade children the 2: typewriter provides: (a) early contact with print, (b) assistance in developing word and sentence sense, (c) stimulation to reading readiness, (d) much interesting reading practice.
- For second and third grade children the typewriter 3. provides: (a) stimulation to much supplementary reading, (b) practice in informal reading of simple material, (c) expansion of the reading vocabulary.
- For fourth, fifth and sixth grade children the typewriter provides: (a) stimulation to much supplementary reading, (b) a means of refining the vocabulary, (c) a method of checking reading comprehension.

Spelling .-- Since the basic method of learning the spelling of words consists of repetition until the order of letters has been habituated, it follows that dozens of repetitions on the typewriter make for clear perception and correct recall. The order of letters is emphasized, just as is the order of sounds of speech. Furthermore:

- 11. The typewriter creates a 'felt need' for spelling.
- The typewriter makes drill and practice more 2. effective.
 - The typewriter provides clear images of words. 3.
 - The typewriter facilitates perception and correction of mistakes." 2 4.

Op. cit. p. 106-111

Haefner, Ralph, The Typewriter in the Primary and Intermediate Grades, New York: Macmillan Company, 1932. p. 139-143

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Perhaps the best contributions made by the use of the typewriter to the learning of spelling has been summarized by Haefner.

- "1. The typewriter exerts its most important influence on the language subjects: spelling, reading, composition.
- 2. The typewriter contributes to spelling in the following ways: (a) it provides a clear-cut image, (b) it facilitates detailed word analysis, (c) it gives mechanical emphasis to correct letter order, (d) it makes extensive spelling practice attractive to pupils.
- 3. For the kindergarten child the typewriter makes possible the following spelling activities:
 (a) writing his name many times, (b) writing twenty or more different words, (c) copying a few complete sentences.
- 4. For the first grade child the typewriter affects spelling in the following ways: (a) it makes possible early copying of words used in reading, (b) it provides intensive practice on a limited list of words, (c) it gives some practice with a large group of words, (d) it lays the basis for spelling by dictation.
- 5. For the child in second or third grade the machine has the following relations to spelling: (a) it provides an effective way of presenting new words. (b) it makes possible interesting practice on words which are difficult for the individual, (c) it stimulates comprehensive individual spelling reviews.
- 6. For children in fourth, fifth, and sixth grades the typewriter has the following relations to spelling:
 (a) it provides the basis for systematically enlarging the spelling vocabulary, (b) it aids in refining the spelling vocabulary."

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Handwriting. -- "Why does a child learning to write screw up his face into the most grotesque expressions of physical pain? Why do we hate to write letters and put them off as long as we can? The answer is that the process of putting thoughts down on paper calls for an actually arduous coordination which is difficult for a child to acquire and which leaves us, even as adults, a sub-conscious distaste for writing." ... "The process of coordinating all the muscles and getting the letters correctly formed is so absorbing that the child forgets the thoughts he started to write. The thought itself is a mental hurdle and the problem of writing correctly is both a nervous and muscular hurdle; so he has to negotiate two or three hurdles at once. Even when the child has done his best, it doesn't look like the book."

"The degree of usefulness of the writing will depend largely upon the ease and fluency with which the pupil can write, as well as the legibility of the written record. There is no question that the efficiency of a student is influenced very considerably by the facility with which he can write. The value of writing to the adult may also be divided into the two aspects of keeping records, and expressing thoughts in correspondence. If the adult has not a thoroughly good mastery of the art of writing, he will avoid

^{1/} Wiggam, A. E., "Children at the Typewriter", School and Society 49:212-214, February 18, 1939.

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and when he does write, the difficulty of the process will cause loss of time and the distraction of attention from the thought which he desires to express. Furthermore, the poor quality of the result will make the record difficult to interpret, or will produce an unfavorable reaction to the reader.

structed to make writing a pleasure rather than a task, so has "...typewriting has developed in popularity until it is now often spoken of as the twentieth century method of writing. That it is no longer regarded as merely a tool to be used in a business office, is indicated by the numerous courses in personal typewriting offered from the primary grades, through high school and in college. The modern typewriter has given the individual a means of expression and a measure of fluency far beyong the limits of hand-writing."

The question naturally arises as to whether or not handwriting suffers as a result of the use of the typewriter.

^{1/}Freeman, Frank N. and Daugherty, Mary L., How To Teach Handwriting. New York: Houghton Mifflin Company, 1923 p.1-2

^{2/}Watson, Dorothy E., An Analysis of First-Draft Typewritten Compositions of Seventh and Eighth Grade Typists. Unpublished report, University of Chicago, 1940. p. 2

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Reynolds was convinced that handwriting does not suffer from the use of the typewriter. "The typewriter creates interest in letters and words; it gives the child forms to imitate by hand. It sets before him examples of legibility, even margins. good form, and neatness which are guides to his handwriting."

Haefner concludes:

- "1. The typewriter is a promising substitute for the pencil in the kindergarten and first grade, and also serves as a good introduction to handwriting.
 - 2. The typewriter provides intermediate grade children with a means of clear, flexible writing suited to varied and extensive composition work.
- 3. Handwriting standards need to be maintained even when the typewriter is used extensively."

Composition. -- In examining the free compositions of four hundred and fifty children which had been written by hand,

Leary found that the value of free compositions goes far beyond the apparent educational results. Leary states, "...free compositions constitute an important tool in the hands of a teacher who is interested in guidance. Almost at a glance, one can become conscious of the quality of work, the ease of expression, the ability to write fluently, the sentence sense, the spelling, the handwriting, and the punctuation.

^{1/} Op. cit.

^{2/} Op. cit. p. 272

^{3/} Leary, Genevieve M., Free Compso tion as an Aid to the Teacher in Child Guidance. Unpublished Doctor's Thesis. Yale University, 1936. p. 119.

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Then a closer examination reveals the child expressing the things that are important to him: his likes and dislikes; favorite sports and pastimes; attitudes toward adults and his impressions of them; what he sees, feels, and hears in the environment; the types of contacts with humans, animals, or things that he craves; his timidity or longing for "he-man" thrills, excitement in which some of the cards are stacked against one's self or against authority; the superstitions and beliefs that are part of his social heritage; and how he responds when he withdraws from reality and essays imaginative flights."

The quantity of these expressions naturally increases when the obstacles of the writing process have been removed.

Haefner feels that "One of the machines most striking influences is greatly to increase the total volume of writing.

Apparently, children prepare much typed material because they enjoy the activity, can work with ease, and are able to achieve immediate and visible results."

"... In grade one, for example, the Experimental children wrote, during a single school year, an average of more than three thousand words each, of which about half was handwritten, while Control children wrote less than five hundred words each."

^{1/} Op. cit.

^{2/} Op. cit.

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Wood concludes:

"1. The typewriter facilitates self-expression.

2. The typewriter increases the amount of independent writing by children.

3. The typewriter reduces the distraction of writing.

4. The typewriter helps teach language and writing form."

In discussing the Wood and Freeman experiment, Haefner summarizes as follows:

- "1. Because of the educational experience which they have acquired, many of the older children are able to make very extensive use of the typewriter in connection with composition work.
 - 2. The typewriter influences composition in the second and third grades in the following ways: (a) it frees energy for use on the content, (b) it stimulates the preparation of carefully arranged papers, (c) it increases the amount of writing which children are able to do.
 - 3. The typewriter facilitates the following types of composition activities in the second and third grades: (a) practice exercises in correct use of mechanics, (b) copying of handwritten compositions in correct form; (c) simple original stories, poems, and letters, (d) long original stories and descriptions; (e) written projects related to health, literature, and social studies, (f) exercises dealing with specific formal elements of language.
 - 4. Expansion of the pupils' knowledge in the intermediate grades makes methods of integration important.
 - 5. The typewriter facilitates the following kinds of composition activities in the intermediate grades:
 (a) much early practice in copying material with

^{1/} Op. cit. p. 116-123.

^{2/} Op. cit. p. 187-190.

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6. The typewriter influences intermediate grade composition in the following ways: (a) it serves as an incentive to extensive writing, (b) it tends to produce facility of expression, (c) it aids in mechanics of writing.

Social Studies, Science and Art .-- Subjects such as history, geography and science are composed of complex material, and it is reasonable to expect that such studies would not be influenced by the use of the typewriter until after a long period of time. Nevertheless, after two years of experience with the machine in the classroom, the teachers reported numerous advantages of typed exercises in the content subjects. One of the most frequently mentioned contributions of the machine was the large amount of written project work which it made possible. Long illustrated books were prepared by individuals and groups dealing with birds, animals, flowers, science experiments, Indians, and favorite stories. Many special types of work were also readily done, such as new-type questions in the social studies and science, labeling of geography maps, and preparation of ballots for school elections.

^{1/} Op. cit. p. 7.

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Even in connection with the art subjects children find valuable uses for the typewriter. The machine serves to correlate art materials, such as pictures, with written compositions. The pupils can arrange both to advantage in a booklet. Children will often find it interesting to draw a picture to accompany a description or a story which they have typed.

- "1. The typewriter can be used for a number of practical purposes in connection with social studies, science and art.
 - 2. The machine assists in the social studies in the following ways: (a) by facilitating the organization of material, (b) by increasing social contacts, (c) by furnishing a means of practicing on basic facts, (d) by providing for a number of specialized uses in connection with maps, charts, tables, and exhibits.
 - 3. The machine assists in science in the following ways:
 (a) by making possible systematic organization of
 material, (b) by facilitating practice with basic
 facts, (c) by providing for specialized uses in
 connection with labeling diagrams and describing
 results.
 - 4. The machine assists in art activities in the following ways: (a) by providing a means for connecting art closely with other subjects, (b) by stimulating the preparation of drawing for use with stories and poems, (c) by furnishing a means of producing novel illustrative material, (d) by providing a method for carrying out a number of mechanical phases of art, such as drawing borders and music staffs.

^{1/} Op. cit. p. 17.

^{2/} Op. cit. p. 259.

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Arithmetic. -- Contrary to expectations, the typewriter was found to have made some contribution to the learning of arithmetic. In the study made by Wood it was disclosed that, much to the surprise of the investigators, there was evidence of superiority in favor of the typewriter pupils in arithmetic computation tests. Dr. Wood finds that:

- "1. The typewriter helps to establish clear images of the numbers.
- 2. The typewriter helps to associate meaning with number symbols.
- 3. The typewriter reduces arithmetic errors.
- 4. The typewriter motivates writing original arithmetic problems."

Haefner summarizes the Wood and Freeman experiment when he says:

- "1. The uses of the typewriter are more limited in connection with arithmetic than with verbal subjects.
- 2. The typewriter enables young children to obtain an early informal introduction to numbers.
- 3. The typewriter provides children in all grades with a means of obtaining clear-cut perceptions of numbers arranged in systematic order.
- 4. In counting practice, younger children obtain a double stimulus from the use of the typewriter: that from the numerals on the keys, and that from the clear impression on the paper.
- 5. Practice in simple computation exercises using the four fundamental operations can be obtained by children from the second through the sixth grades.

^{1/} Op. cit. p. 135-138

^{2/} Op. cit. p. 219

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- 6. Limited practice on complex computation problems can be obtained in fourth, fifth, and sixth grades.
- 7. Verbal problems using simple computations can be solved in grades one through four.
- 8. Decimal problems, including computations involving United States money, can be carried on especially well on the typewriter.
- 9. The operations needed for the following kinds of problems are rather difficult to carry on by means of the typewriter: Long division, complex multiplication, fractions."

Children's attitudes. -- The typewriter, like a toy, holds a fascination for the child. In an article written to parents, Brownstone comments, "Many fathers know that on a visit to the office the typewriter is the first thing to arouse interest."

Reiley quotes from an editorial which said, "Most potent of all the influences on learning probably was the aura of joy with which the machine invested the process. 'School is so much more interesting with the typewriter,' wrote hundreds of children. 'I wish,' said one kindergarten child, 'Santa Claus would bring me a typewriter.'"

The following, according to Wood, are reasons given by the children for liking the typewriter:

1. Younger children "can write."

"To these younger children, the fact that they are able to write at all is the outstanding thing about the typewriters: and the fact that their

Brownstone, Cecily, "Learning to Typewrite," Parents Magazine 13:24, October, 1938.

^{2/ &}quot;Typewriters for Children at Home and in School." (Reprint of article by Alan C. Reiley from Office Appliances.) Typewriter Educational Research Bureau, New York, p. 11

^{3/} Op. cit. p. 96-99.

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writing 'looks like the book' is nothing short of wonder to them."

2. Older children can "do everything" on the typewriters.

"Many of the children in the upper grades emphasize the helpfulness of the typewriter in their written projects of all sorts, including booklets and reports on geography, history, nature study and civics, arithmetic notebooks, the school newspaper, labeling objects in exhibits, and especially in their original composition work."

3. Typewritten papers are more satisfying.

"The children in all grades, from the kindergarten to the sixth grade, emphasize the more satisfying appearance of the typewritten work."

4. Work at the typewriter is more satisfying.

"Many children in all grades say that typewriting is 'easier' than handwriting. Children in the upper grades say they can 'write faster and cover the subject better' on the typewriter than by hand. Others say that the typewriter helps them to 'concentrate on what they are writing about and think of more things to say about it.'"

5. Typewriting is enjoyable.

"The delightfulness of typing as a physical activity associated with a colorful and interesting mechanism, is mentioned in nearly all the reports."

6. Children want typewriters.

Several hundred of the letters received at the conclusion of the Wood-Freeman experiment expressed the hope that the children might have the machines in the classroom again the following year.

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Looking at it from an adult viewpoint, Haefner thinks that the attraction is due to the following:

- 1. Portable typewriters appeal to children immediately for four general reasons: (a) the external attractiveness of the machines, (b) adaptability in the size of the machine to children's needs, (c) mechanical ingenuity of the machine, (d) the appeal of typing as an adult activity.
- 2. Children's interests in the machines are individual in character, but are of three main types: (a) a practical interest, (b) a mechanical interest, (c) a vocational interest.
- 3. According to their own written statements children in all grades of the elementary school are over-whelmingly in favor of the classroom use of type-writers.
- 4. The composite statements of a group of children from any grade produce a very long list of specific uses and advantages which pupils find in type-writers.

The practical, mechanical and vocational interests, aroused by the use of the typewriter, have resulted in a definite change in classroom attitudes of the children.

Wood has found that:

- 1. General morale of pupils improved.
 - 2. The typewriter promotes self-criticism on the part of pupils.
 - 3. The typewriter promotes good working habits and attitudes.
- 4. The typewriter promotes an attitude of responsibility.

^{1/} Op. cit. p. 323

^{2/} Op. cit. p. 96-99

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- 5. The typewriter develops self-confidence in slower children.
- 6. The typewriter promotes cooperativeness and mutual helpfulness in the classroom.
- 7. The typewriter promotes independence.

Teachers' attitudes. -- An editorial quoted by Reiley gives us the sum of teachers' attitudes when it says, "Children who like to go to school, who arrive before school opens and beg for permission to stay in after it closes, who adore writing lessons and seize upon the slightest excuse to write their history, geography, arithmetic; children who love spelling and crave to learn punctuation - they are no over-worked teacher's dream of what heaven will hold for her. They are present right here on earth."

Freeman states the attitude of the teachers who participate in the Wood-Freeman experiment:

"In the case of the teachers, the introduction of the typewriter involved a considerable burden of additional work and an adjustment to a new instrument of instruction. Their favorable judgment, therefore must be attributed more to their recognition of the educational benefits to the pupil than to

^{1/} Op. cit. p. 12.

^{2/ &}quot;An Experiment in the Use of the Typewriter in the Elementary School." (Reprint of article by Frank N. Freeman from Elementary School Journal.) Typewriter Educational Research Bureau, New York.

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any pleasure which they derived from the introduction of the machine. They testified to the pupils' enthusiasm, to the improvement in their written work, to the development of self-confidence on the part of some of the slower pupils, and to the general favorable influence on the pupils' attitudes. Ninety-three per cent of the teachers who had two full years of experience with the typewriters recommend the continuance of the use of the machines in their own grades."

Administrative aspects. -- Haefner feels that "problems inherent in the use of the typewriter in the elementary schools are relatively simple and the results obtainable are seemingly commensurate with the investment adjustments involved."

He advocates the use of primer size type in the primary grades, and machines with pica type for the intermediate grades. It is not necessary to provide a typewriter for each child. Haefner suggests the following set-up:

Kindergarten class.....2 - 3 machines

First grade.......4 machines

Second grade......5 machines

Third grade......6 machines

Fourth grade......8 machines

Fifth grade.......10 machines

Sixth grade..........12 machines

^{1/}Haefner, Ralph, "Typewriter in the Elementary School: What Are the Administrative Aspects?" American School Board Journal 93:29-30, December 1936.

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Reynolds states, "In the Horace Mann School we value a certain by-product of the use of the typewriter. We do not furnish a typewriter for every child. For a room of twenty-five children there are, say, five machines. These machines are presented to the children as the common possession of the group. They are, so to speak, common property. Individual responsibility for their care must be assumed by each child. The children themselves draw up the rules and regulations under which the typewriters can be used. There must always be careful consideration for the rights of all. There is much more education for a six-year-old in a typewriter than the superficial observer would recognize."

A very good suggestion is offered by Brownstone who says, "What outlook is there for the school that has not been able to gain typewriters as part of their basic equipment? Teachers and parents, impressed by the use to which the machine can be put in the classroom, can cooperate in acquiring one or two or three or more typewriters and putting them at the pupils' disposal. Some schools have done this and it proves an excellent example of cooperation. When some of these machines are portable the boys and girls should be allowed to take turns in having them at home overnight. At the Horace

^{1/0}p. cit.

^{2/}Brownstone, Cecily, "Learning to Typewrite", Parents Magazine 13:24 October, 1938.

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Mann School there are twenty-five of these portable typewriters which may be borrowed. They are kept in the library and the children come and take them out as they would a book and return them in the same way. In this school it has been estimated that half the children have typewriters of their own at home, another quarter use the one in the library, so that in all, three-quarters of the pupils actually have access to and use the machines."

Conclusions .-- Brownstone maintains that the typewriter plays a large part in the elementary education.

- "1. Immature muscles are much better able to cope with the simple process of striking keys than with the cramped movement of handwriting.
- 2. It has been found that the typewriter is actually an aid in the teaching of reading.
- 3. It stimulates interest in number work, spelling and composition."

He concludes, "Here is a way of developing good work habits, a way of adding immeasurably to children's learning. Typewriting is not a substitute, it is a new and valuable tool in education." More specifically Reynolds states: "The typewriter affects many desirable educational processes. We have found that the compositions written by children on the typewriter are considerably longer than those written by hand.

^{1/} Op. cit. p. 24.

^{2/} Op. cit.

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We find that pupils write much oftener when typewriters are available. The typewriter seems to give to children an incentive to written expression and a capacity for longer and more sustained effort. It is used for all sorts of written work-for notebooks, neat as can be, in history, geography, and English; for problems in arithmetic, notices for the bulletin board, invitations to parties, programs for concerts, plays, assemblies. Throughout the whole school one finds this new device helping children in one of man's oldest activities, the communicating and recording of his ideas. There is no question as to the positive influence of the typewriter on the process of education; it has been demonstrated by actual practice."

Greatest consideration should be given to the conclusions of Dr. Wood and Dr. Freeman who conducted the largest
and most complete investigation into the subject. In their
book they state:

"The study as a whole presents strong evidence,

- 1. That it is feasible to use the typewriter in the conduct of the ordinary work in the elementary school.
- 2. That the use of the typewriter in the informal fashion in which it was employed in this study produces an average typing speed approximately equal to the average handwriting rate in each

^{1/} Op. cit. p. 184

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grade, and also yields a very considerable degree of typing accuracy at the end of one year's use,

- 3. That the use of the typewriter stimulates elementary school pupils to produce more written material than they would otherwise produce.
- 4. That the classroom typewriter, as used in this experiment, entails no loss in handwriting quality or handwriting rate,
- 5. That it very probably raises in some measure the level of achievement in some of the fundamental school subjects, without observable loss in any subject, and finally,
 - 6. That the teachers regard the typewriter as a valuable educational instrument and approve its use in their own classes, while pupils enjoy typewriting and look upon the typewriter with marked favor."

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CHAPTER IV

PRESENTATION OF PRESENT PROBLEM AND ADMINISTRATION OF THE STUDY

Previous study made by the writer. The findings of the research studies were of particular interest to the writer because, unaware of the Wood and Freeman study, she had conducted a study in 1935 with her third grade class at the Southwest School in Hartford. The main purpose was to provide stimulation for both the pupils and the teacher. With four typewriters, loaned by the Underwood Typewriter Company, the pupils conferred on standards they wished to maintain for their proposed Typewriting Club. Because part of the language activities consisted of original stories written twice weekly, it was decided to have these stories form the basis for the entrance requirements.

The requirements formulated were:

1. Handwriting was to be neat and legible.

2. Stories were to be interesting.

3. Correct spelling of words which proved difficult (placed on blackboard by the teacher) were to be transferred to the child's individual dictionary.

4. Correct punctuation and format were to be observed (which resulted in a "felt need"

for lessons on the subject.)

When three stories were accepted, the child became a member of the Typewriting Club and was permitted to use the

^{1/} Op. cit.

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machine in his spare time. No attempt was made to introduce the touch system. After a few instructions on the mechanics of the machine, a discussion of the use of the left and right hands, and consultation of the wall chart, the children were free to work out a system suitable to themselves.

The results far surpassed expectations. - handwriting improved greatly, simple stories took on a new twist. Most noticeable of all was the attitude of the children. They were proud of the comment their Typewriting Club was creating, and used every spare moment to add new pages to their typewriting booklets. Discipline problems, as such, were nonexistent. One case, typical of several, was that of an intelligent boy, - a psychological clinic case. His work, carelessly done, was rarely finished. His chief interest lay in annoying the other children. After much sincere effort he was admitted to the Typewriting Club. At ten s'clock, thereafter, he could be found at the typewriter, having completed the morning's assignments neatly and legibly. His interest now lay in writing notices for the bulletin board to inform the others of the various stamps from his collection that he wished to trade. His adjustment to the group and his acceptance by them had been brought about by the use of the typewriter.

The end of the school year found the children typing at a fair rate and with considerable degree of accuracy.

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Further satisfaction was gained by the author when she was informed in later years by the Junior High School teachers that these same children had continued the use of the type-writer and were handing in homework assignments neatly and accurately typed.

Description of the present situation. -- Emboldened by the testimony of research students, and by her personal experience on the third grade level, the writer decided to conduct a study of the influence of the typewriter in the first grade.

The first grade class selected in Hartford, Connecticut, consisted of twenty-eight children ranging in age from 6-2 to 7-4 and average in both educational and socio-economic background. The teacher had a knowledge of typing and was interested in discovering whether or not this adult tool would prove of value to such small children.

Plans had been made to carry on the study for at least four months but, through necessity, it was restricted to a period of two months. Due to wartime conditions, great difficulty was experienced in obtaining typewriters. The rental agencies could provide standard machines but it was decided to delay the study until portables were available. It was felt that a portable typewriter would appeal to the child because of its attractive appearance, and the compactness

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of size which would enable the child to move it wherever he wished to work. The portable would adapt itself to the small desks and permit the child to see the board or teacher while working at the machine.

Following the suggestion of Haefner, four typewriters were used but conditions were such that only two typewriters could be obtained during the first month of the study. The eagerly awaited arrival of the other two for the second month found a classroom of children who were now acquainted with the machine and full of plans for their use.

These machines were placed on extra desks at the rear of the room and left there during the day so that the children could go to them for their work. In this way it was possible to have the concentration of sound in one part of the room.

In introducing the typewriters to first grade children, no attempt was made to set up control and experimental groups. It was planned, merely, to give the children experience with the machine and to study the reactions of both pupils and teachers.

^{1/} Haefner, Ralph, The Typewriter in the Primary and Intermediate Grades. New York: Macmillan Company, 1932, p. 278.

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After the study had been in progress for a few weeks, the Typewriter Educational Research Committee of New York became interested in the work and offered to assist in expanding the study. Twenty typewriters were sent to the schools for a period of eight weeks and a teacher assigned to instruct the children in the mechanics of the machine. This enabled a survey to be made also in grades above the first. Since this project did not begin in time to summarize results for this article, it will be offered as a supplement when completed.

Introduction to the machines. -- When the first grade children discovered the typewriters in their room one morning there were many comments. All recognized the machine and many were anxious to tell where they had seen one previously. It had been used as a toy only. When interest was aroused, it followed naturally that questions came speedily as to "What could we do on the typewriter?" As anyone acquainted with young children knows, - their ideas were more ambitious than practical. They wanted to write letters, their own names, letters of the alphabet, songs, and many other things. Before long there was need for group discussion of the responsibility in having such expensive tools as typewriters in the room, - idea of cost of each machine, danger of dropping, need for protection at night and when the

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machines were not in use. All this provided much valuable give and take with children who were eager to start.

The first step in the use of the machine was, of course, the demonstration of the mechanics. Four or five of the more able children watched the unlocking of the cover and the insertion of the paper. There was great interest in where it went in, where it came out, and how the knob at the right turned the paper. After several demonstrations, the four or five children were given their turn in painstaking and slow manipulation of the paper. The next step was an examination of the keyboard. An important discovery was that one could make a letter by pressing the key down and that you must strike it as if it were hot to make a clear letter. Other keys were tried until the bell rang. The bell ringing called for further explanation and there was a natural step ahead to the use of the lever at the left where the carriage is returned and the paper moved up. Each child then had the experience of typing a few letters. In satisfaction, they returned to their seats while other groups became initiated.

The preliminary instruction was followed by a period in which each child became intimately acquainted with the machine, - striking keys at will and picking out letters of the alphabet. The desire to write something was present at the very start. The child's name seemed not only logical but

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satisfying to him. This called for a model name card and necessitated the teaching the added step of the shift key to form the capital. Pushing down the shift key and holding it while the letter is struck called for much practice before the letter was clear. The problem of spacing between the first and last names was discussed and taught, and this necessitated the use of the thumb in the act. Care was taken to discourage the tendency to have undue spacing between words. (Fig. 22) Varied progress was made by the children in writing their names. A number learned almost at once while other took two weeks for mastery and some were unable to type the name at the end of two months. One immature child, having difficulty because of the jamming down of her whole hand, was unable, at first, to control the muscles of the hand and strike just one key.

The early supervision was very detailed as the teacher soon realized that the early learning period was very important if precise attack was to be made and correct habits initiated. As the children became more secure with their success with the machine they were more and more able to explore its possibilities.

Later use by the children. -- Now that the children, for the most part, were familiar with the machines such as insertion of the paper, striking of the keys, return of the carriage anticopy of the capables to edges of or all to the capable of the

The party supervises were very described as the teacher of an approximation of the control as the first teacher and the precise was to the seminary correct and the precise at the precise the city that the party that

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by use of the lever, the shift key, space bar, and location of the letters, they were ready for further instruction. Up to this time all used one hand, the dominant one. A wall keyboard chart was introduced. A division through the middle of the chart pointed out the possibility of using two hands. The children were given small keyboard charts, Page 90, to be colored, - those letters to be used by the left hand, in green; by the right hand, in red. These were studied by the children voluntarily and eagerly taken home for display to the family. Practice was given on words to be typed with the left hand, right hand, or both. These words were taken from the Durrell-Sullivan Remedial Reading Vocabulary List (Primer and First Grade) because it provided drill on the basic sight vocabulary which the children were meeting in their reading. Two hand practice was encouraged.

In a relatively short time the teacher was able to give more supervision to certain individuals who needed it, as children with special aptitude relieved some of the supervision by serving as models to an admiring audience and also as pupil - teachers. Games were introduced in which letters were read from the wall chart while other children told which hand would be used when striking the key.

Typewriting system used .-- No formal typewriting system was introduced other than the use of the left and right hands

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as it was believed to be difficult, fatiguing, and discouraging to young children. It was no disgrace to use one hand, but the use of two hands was given approval.

Problem which arose. -- As more and more children gained mastery in the use of the machine, it became necessary to work out a schedule for the use of the machines. This called for group discussion of the need for quietness. The noise due to the clicking of the keys was really no disturbance after the first few days, - it was accepted, but the tendency of the children to leave their work and cluster around the typists and to call on the teacher, who was busily engaged otherwise, for frequest requests to typewrite did make for distraction. As an outcome of the discussion they formulated the following simple rules concerning the general use of the typewriter:

- 1. Have clean hands.
- 2. Roll in your paper.
- 3. Type your name.
- 4. Do not go near the typist until it is your turn.
- 5. Be careful of the typewriter.

Care of the typewriter. -- An important part of the whole study was, of course, the care of the typewriter. Due to the fact that the children were young and might injure themselves or the machines, it seem advisable for the teacher

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to lift the machines. However, the children were taught to unlock the cover and just push it back since the device for removing the cover proved too complicated on these machines. The operation of the keys to prevent hammering and jamming called for much supervision. It did not take the children long to learn the secret of jammed type. Replacing the cover presented a more difficult task. There seemed to be so many little tricks to it, - the return of the carriage to the center of the machine, the easing in of the carriage lever, the release of the shift key so that the cover could be fitted on snugly and locked. All were mastered in time.

Interesting experiences of the children. -- Whenever the teacher used the typewriter after school she had many interested observers. One library report with its underlined title provided the children with the desire to underline everything they wrote. (Fig. 19) For days underlining, the dollar sign, and the bell were tried until the novelty wore off. The greatest delight came, however, when someone discovered the use of the red ribbon. From that time on, stories looked prettier to the children when done in red, with many words typed in black for variety.

The children quickly learned to use the simple marks of punctuation in their writings but Fig. 25 shows the attempts of one child to copy material which included an apostrophe. A

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mistake on a paper necessitated a new start until the teacher demonstrated the back spacer and strikeout key. Errors appeared quite frequently, thereafter, just for the fun of trying out this new gadget.

It remained for one child to solve the problem which arose when counting was tried. After experimenting with all the keys she discovered a way to make the missing number "l". Her face lighted up with pride, - she had made a discovery which she wanted to share with the others. The matter of doing simple arithmetic problems proved a disappointment, however, when no symbols could be found to express the "plus" and "equals" signs.

Many children showed excellent powers of discrimination. Repeated attempts to make the typewritten "fi" look like that in the book resulted in failure until the explanation was provided by the teacher. A comparison of the typed "g" with that done in manuscript brought further comment.

Length of time at the machines. The typewriter held such a facination for each child that it was found difficult to deny him the pleasure of doing all his work at the machine. However, considering the element of fatigue for such small children, the teacher felt it advisable to restrict the use of it to thirty minute periods. Every pupil had an opportunity to type each day; even those who showed little aptitude.

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Several are still in the stage of becoming acquainted with the symbols, trying their names, and doing a little counting, but, to them, even this was a mark of success.

Types of work .-- When the study was started it was not known what these children could do but their enthusiasm soon settled the matter. After practicing their names to their own satisfaction, the children copied everything in sight. "Fire Exit" and "House Rules" made their appearance on many papers, to be followed by word lists and phrase materials from the board. (Fig. 23) Next came the desire to type something which they had read. Stories from books and class compositions on the board satisfied them for several weeks. The teacher puzzled over the source of several items which were placed on her desk and discovered that one list was made up of captions under the pictures in a preprimer. Several children were content to copy anything in print with the result that such words as "Volume One" were found on some papers. children tried out their counting exercises next. A letter to mother, then an invitation to another class followed in order. At the present time interest is centered on the composition of original stories.

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CHAPTER V

ANALYSIS OF THE STUDY FROM THE STANDPOINT OF THE FINDINGS

The study was concerned with the following questions:

- 1. What influence does the typewriter have on classroom atmosphere?
- 2. How does the use of the typewriter affect the learning of reading, composition, and social studies?
- 3. What influence, if any, does the typewriter have on early arithmetic work?
 - 4. What is the attitude of the children toward the use of the typewriter?
 - 5. What is the teacher's attitude toward the value of typewriters in her grade?

While the study was in progress for a shorter period of time than had been expected, due to the difficulty in obtaining the machines, it was possible to note many educational advantages which resulted from the use of the typewriters.

Classroom atmosphere and attitude of the children. -- As one would expect, the introduction of typewriters into a first grade room for the first time proved very interesting and exciting to six and seven year old children. There had to be certain opportunity for random inspection and experimentation, but, very soon, the typewriters were recognized as very useful tools and provided great interest and incentive in individual

CHAPTER V

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learning. As stated previously, and as exemplified in the appendix, growth in written composition was marked. There was a noticeable increase in enthusiasm for school and one could sense the expectancy on the part of the children to adventure on the typewriter.

The realization that they were using the tool used by adults more frequently than other children contributed to this enthusiasm. The privilege of recording some personal product through the use of the typewriter was an incentive to greater effort in the various fields. The clear-cut products obtained seemed to be a source of satisfaction to the children and they hoarded the papers they had typed. There was much opportunity for cooperation and helpfulness among the children in the working out of rules for the typewriter especially in taking their turns in using the typewriter which was such an agreeable tool.

An instance of marked perseverance is that of a boy who copied a sentence with the word "breakfast" (Fig. 27). Recognizing that there was an error, he attempted the word fourteen times before the word was satisfactory to him. This particular child was never known to finish his work until the introduction of the typewriter, and he now finishes in order to win the use of the machine. He could not write his name in manuscript and did not appear to be bothered by this lack but his delight

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when he was able to type his name amazed the teacher. The same boy had not learned to count but now, counts and records his counts to fifty-one. He was so interested in using the type-writer that he preferred not to stop when pictures were being taken. The account of this boy's reaction to the typewriter is one sample of the incentive provided for learning by the use of the typewriter as a tool.

Influence on reading. -- The child, in copying material, appeared to have greater ability in distinguishing between words which had formerly confused him because of similarity in length, beginning letters and general shape. This discrimination was carried over to reading since the children were past the introductory reading stage. It was helpful to them in developing recognition values through scrutiny of beginning letters and the sequence of letters as called for on the typewriter.

The child gained sentence sense while copying material by observing capitals at the beginning, punctuation marks at the end and spacing between words and lines.

A true audience situation was provided for the reading of original compositions to the group. The directional habit of reading was strengthened by letters and words which appeared in sequence from left to right as the child typed his story.

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difficult books selected by the children in typing stories, provided opportunity for supplementary reading. The drill on the Durrell-Sullivan Remedial Reading Vocabulary List, done by the children in learning the proper division of the keyboard for handedness, was found to have contributed to an increased basic sight vocabulary. Perhaps, because the typewriter was introduced at a time when the child had learned to recognize the combination of letters as a word unit, several of the children were observed copying the whole word as a unit thus strengthening the visual memory. Confusion and reversal of letter forms (Fig. 33-54) provided the teacher with the opportunity to point out the correct forms and to devise drills which would establish better visual discrimination. Daily reading lessons gained added meaning when they were typed and taken home for another reading to mother.

Oral Composition. -- The care of the typewriters, together with rules formulated for its use, provided opportunity for discussion by the class. Further sharing of ideas came in the group composition of stories, letters, and invitations. In choosing material for display on the corridor bulletin board there was discussion and selection by the children.

Written composition. -- It was found that the children were learning the mechanics of composition by their observation and use of capitals, periods, margins, and spacing.

Oral Composition - The care of the typowriture, together with rules formulated for its new, provided copportunity for disputation by was alone. Further shartness of loss and a loss and in canosital and for display on the corridor bulletin or disputation by the collection and delicity on the corridor bulletin board there was also unated and melaction by the children.

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Simple letters with the headings, salutations and closings, provided the introduction to language form. Original stories and letters resulted in a greater amount of writing, unhampered by the laborious task of forming letters by hand. (See appendix)

Social Studies. -- The development of social relations was revealed in the invitations to the principal and another first grade. Group compositions were typed and illustrated as additions to the class book of the seasons. Simple stories added much to illustrated Valentines and Easter cards. (See Appendix.)

Spelling. -- Although spelling was not taught as a subject in the first grade, it was learned informally. Children, doing practice exercises for hand drills, were heard to spell the words, "d-o, do"; "r-u-n, run." Original stories created a felt need for assistance in spelling difficult words. Many children developed their powers of word discrimination to the extent that any error made in copying material was quickly recognized. Writing of the letters of the alphabet and the names of the children, together with the recognition of capitals and lower case letters, increased the spelling consciousness of the class. It is felt that the kinesthetic approach to spelling contributed much to the retention of words, especially for children who were inclined to write slowly and laboriously.

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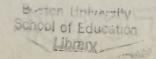
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the children was done in that the transition of words, especially
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At the end of the second month, several children were able to type four to six letter words from memory.

Arithmetic. -- The greater part of arithmetic work in this grade consists of counting, and the use of addition and subtraction combinations that occur in the ordinary classroom life. The contribution of the typewriter was the provision of clear figure patterns to be imitated. Reversals of figures were impossible on the typewriter. In some way, the use of the typewriter facilitated learning to count, for every child enjoyed the exercise of recording his counting to one hundred with proper spacing. (See Appendix.)

Attitude of the teacher. The particular teacher in the first grade situation in which this study was conducted was a very happy choice. In the first place, she had no prejudice toward the introduction of a new and novel tool in her classroom, and she was not afraid of possible classroom disturbance through the additional noise that cannot be avoided when used by young children who are more or less uninhibited. In addition to this, she knew how to type and was interested enough to study the possible learning difficulties which would arise as she provided for step by step mastery of the manipulation of the machine. The writer was aware of the fact that the teacher made her plans very carefully and appreciated the fact that the teacher assumed the responsibility for seeing to it that the beginning habits in the use of



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the typewriter were correctly initiated and sustained through continued supervision. This particular teacher in all sincerity remarked to the writer that just as soon as wartime conditions were removed she would not be without a typewriter because she had felt the marked growth of the children by the use of the machine.

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CHAPTER VI

SUMMARY AND RECAPITULATION OF THE FINDINGS

As was stated at the outset, - it is universally accepted in theory that the school exists for the child. Throughout the description of the administration of the study and the analysis of the study with reference to its findings, the writer has endeavored to point out the valuable contributions the use of the typewriter has made in many phases of learning by the individual child.

Such findings as the few outstanding ones listed below call attention to the opportunities provided for individual pupil growth when such a valuable tool as the typewriter is introduced as an aid in classroom work. Some of these very important findings of the research material reported are:

- 1. The typewriter contributed to the improvement in the mastery of school subjects.
- 2. Writing on the machine provided release and stimulus to the child's power of expression.
- 3. There was a noticeable improvement in the attitude of the children toward school work in general.
- 4. The typewriter facilitated more extensive reading.
- 5. Silent and oral reading showed an improvement.
- 6. The typewriter increased the ability to recognize small differences in shapes of words.

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- 7. More fluency, better expression, and greater smoothness in the reading of first grade children developed from the use of the typewriter.
- 8. The typewriter facilitated self-expression.
- 9. There was an increased amount of independent writing.
- 10. The use of the typewriter reduced the distraction of writing.
- 11. The typewriter created a "felt need" for spelling.
- 12. Extensive spelling practice was made more attractive to children.
- 13. Young children were enabled to obtain early informal introduction to numbers.
- 14. Interest in arithmetic, spelling, and composition was stimulated.
- 15. The typewriter facilitated the perception and correction of mistakes.
- 16. The preparation of carefully arranged papers was stimulated by the use of the typewriter.

The study described in this paper was conducted in a first grade classroom in Hartford, Connecticut, over a period of approximately two months. The group numbered twenty-eight children who ranged in ages from six years and two months to seven years and four months. Two typewriters were used during the first month of the study while two additional machines were available for the remainder of the time.

Upon the completion of this study, the writer was convinced that the typewriter exerted a definite influence upon the educational growth of the first grade child. Concrete 1,00

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evidence of this growth may be summed up in the following findings.

- 1. The children showed an increased enthusiasm for school.
- 2. A sense of group responsibility, cooperation, and mutual helpfulness developed.
- 3. The typewriter contributed to the self-confidence of the slower child.
- 4. It provided an opportunity for the sharing of ideas.
- 5. It brought about a quicker recognition of capitals and lower case letters.
- 6. An interest in letters and words was created.
- 7. More supplementary reading resulted from the use of the machine.
- 8. Audience situations were afforded for the reading of original compositions.
- 9. The directional habit of left-to-right reading was strengthened.
- 10. The typewriter contributed to an increase in the reading vocabulary.
- 11. There was a strengthening of visual discrimination.
- 12. The typewriter helped to establish clear images of numbers.
- 13. Added opportunity for practice in early arithmetic work was provided.
- 14. The kinesthetic factor contributed to visual memory, especially in the cases of children who wrote slowly and laboriously.
- 15. The typewriter provided an impetus for the informal learning of spelling.

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- 16. The observation of capitals, periods, and spacing made for a stronger consciousness of sentence structure, and "sentence sense."
- 17. Introduction was made to language forms.
- 18. The children derived a great sense of satisfaction from clear-cup papers.
- 19. A stimulus for the writing of many original stories by the children was provided by the typewriters.
- 20. The amount of writing done on the typewriter was greater than that which would have been produced by hand.

education is justified in that it results in giving every boy and every girl an opportunity to develop according to his own specific ability, then the effectiveness of a school program seems to depend largely upon the extent to which it is successful in creating and maintaining the interest of each pupil in that which the school has to offer. It is the opinion of the writer, from the findings of the research studies described above and her own experience in this first grade study, that the typewriter has not only created and maintained the interest of the pupil, but it has done more, — it has made a definite contribution to the social and educational growth of the child.

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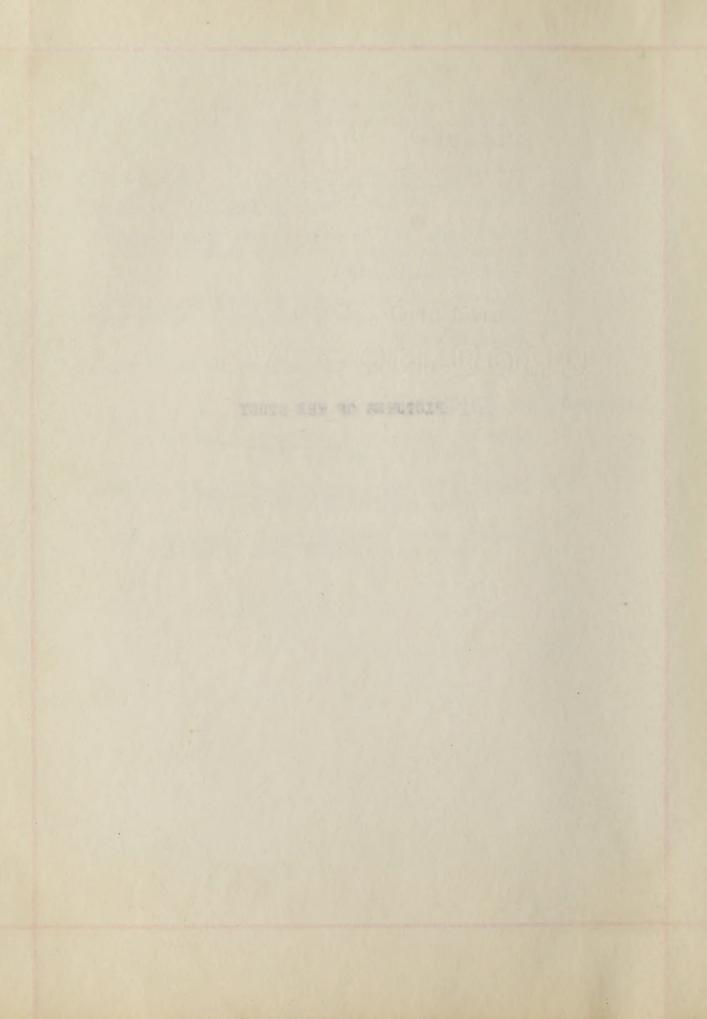
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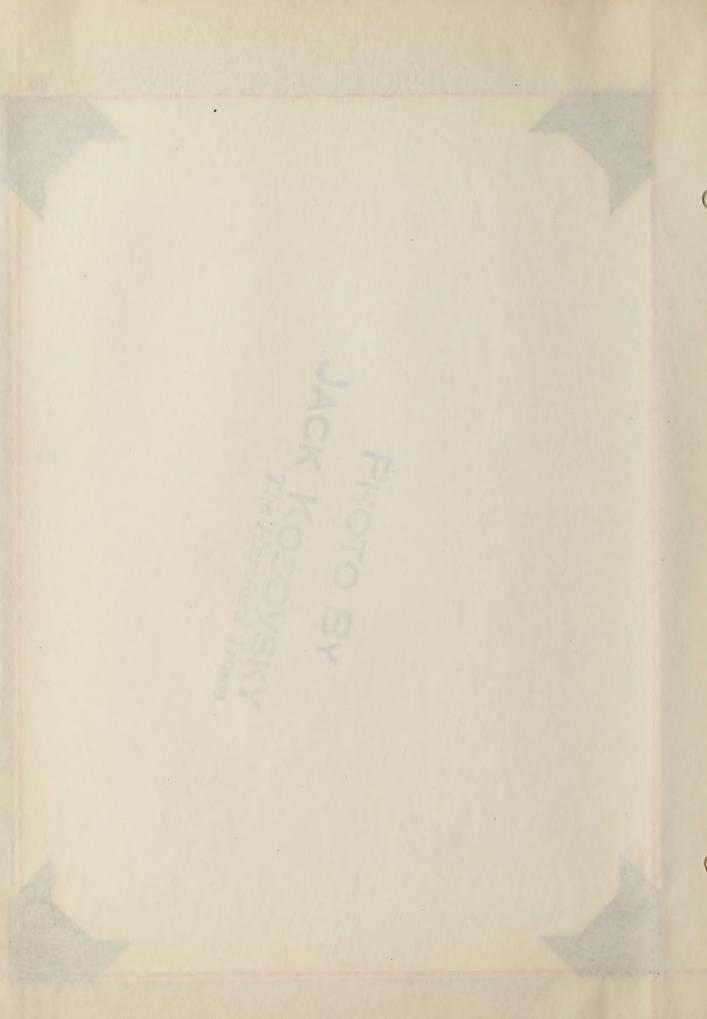
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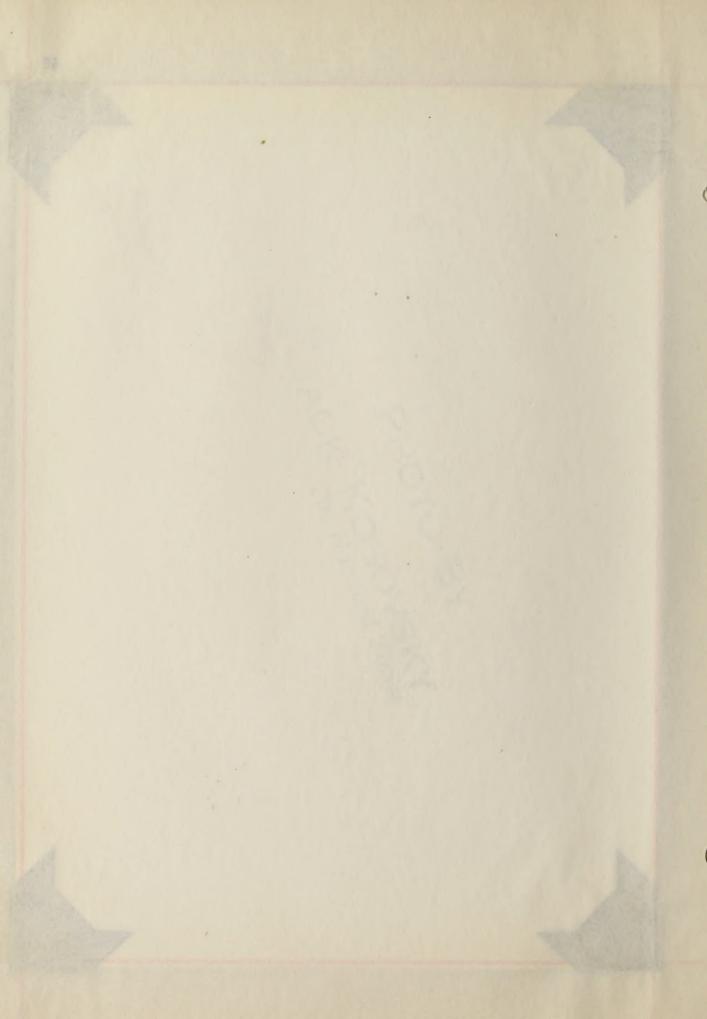


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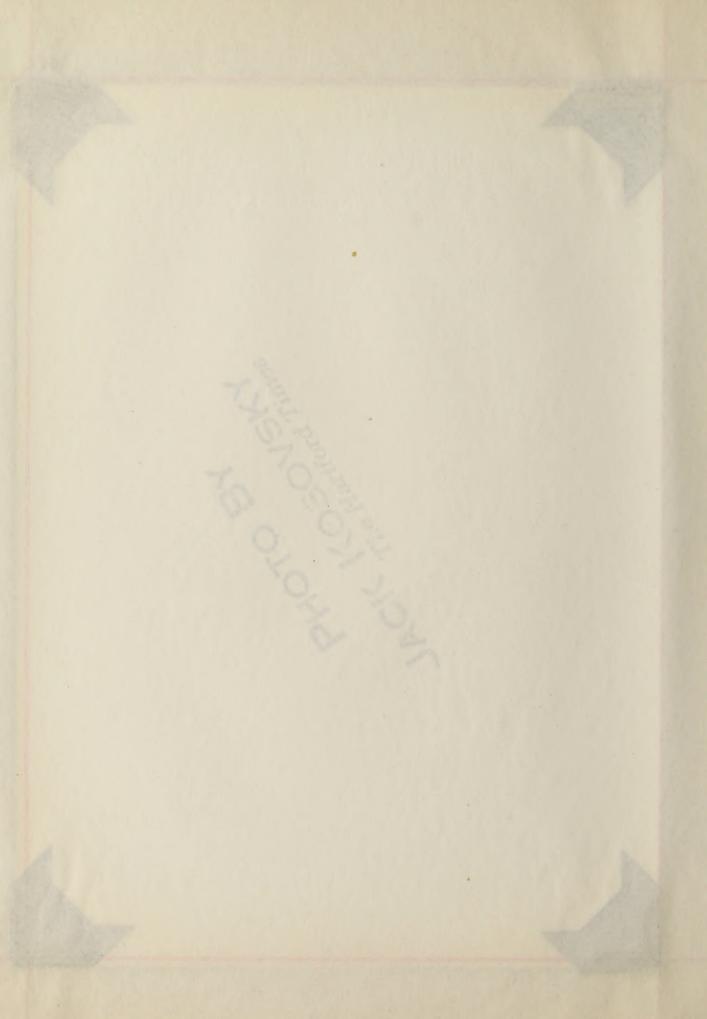


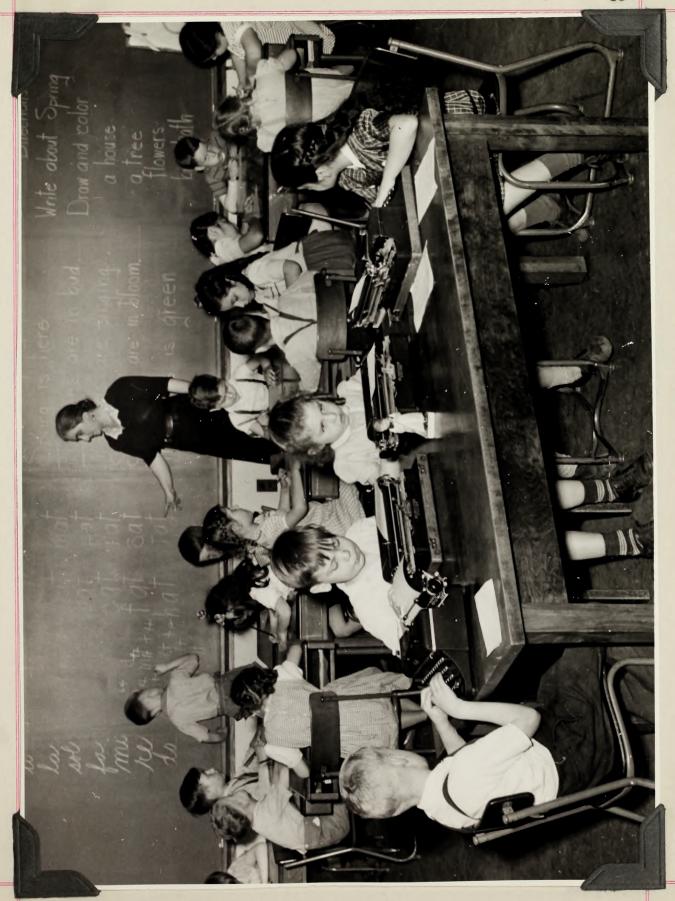


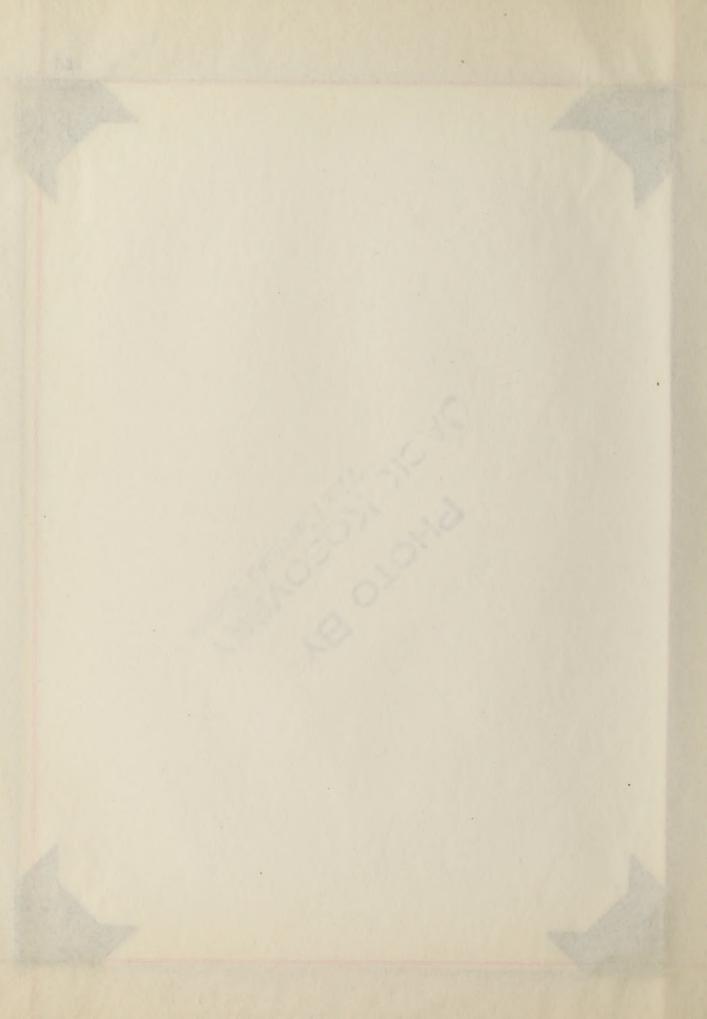
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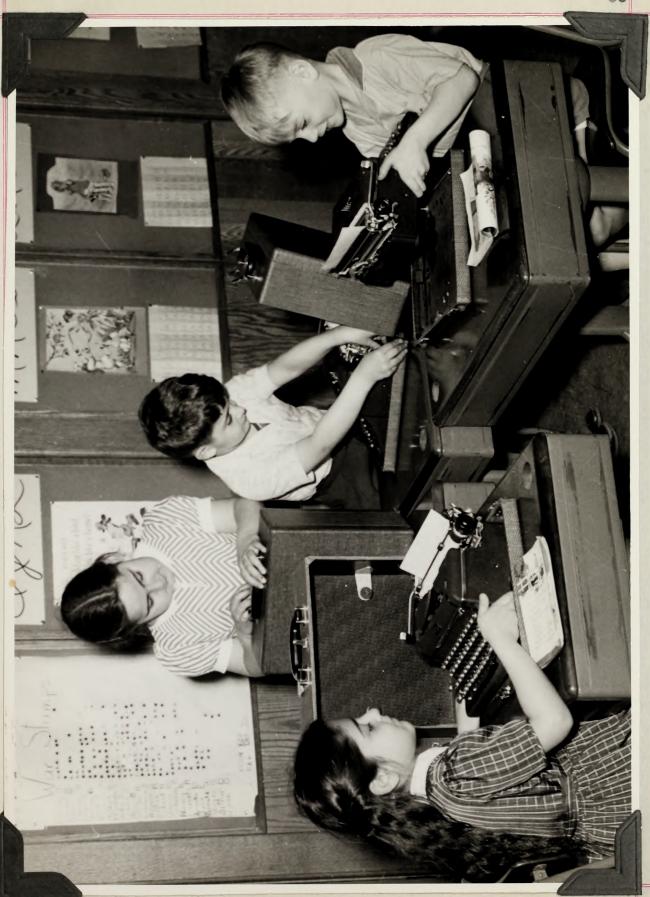


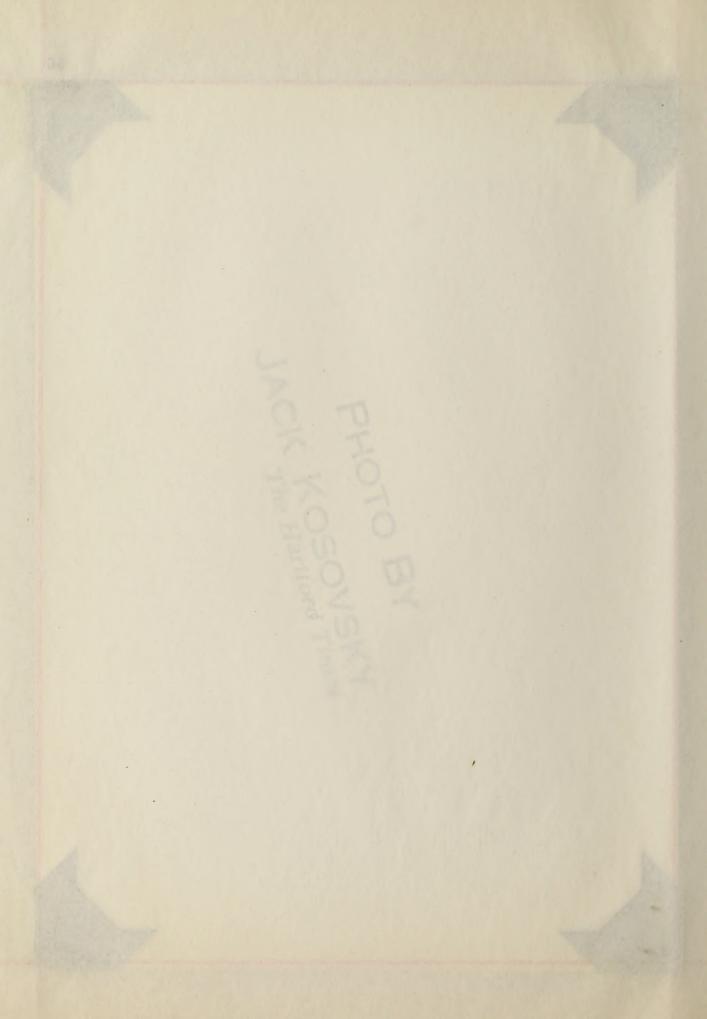


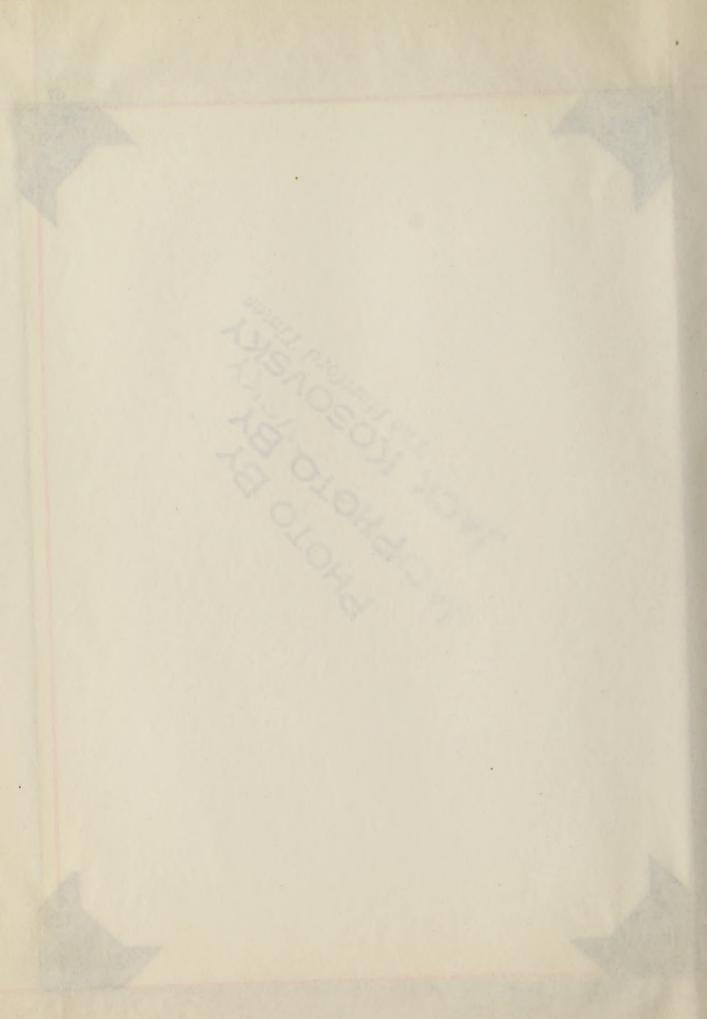


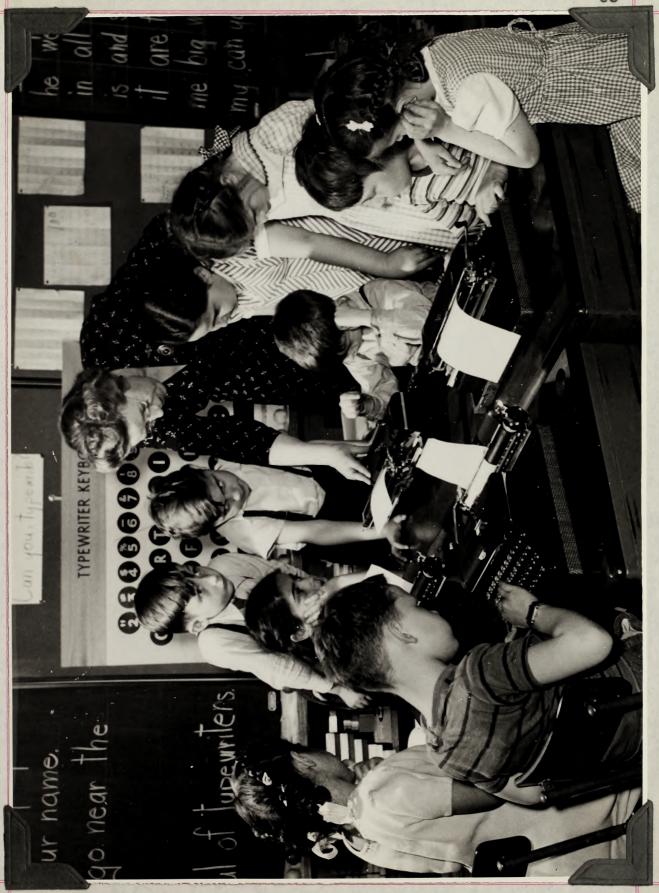






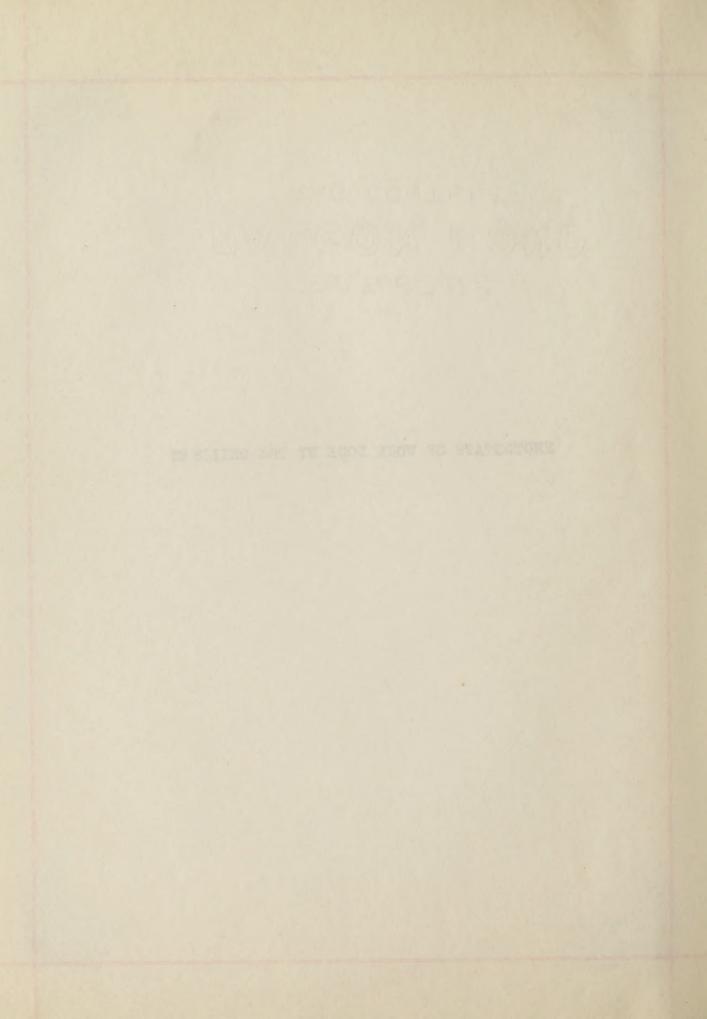








PHOTOSTATS OF WORK DONE BY THE CHILDREN



Joan Berger

The Green House

Here is a green What a preetty green house.

Heere isa green house. What a pretty green house.

Father is at the window in the pretty green house.

This is Father's home.

7ho was Loo:st?

One day Kitt y run away from home.

Soon she wanted her mother.

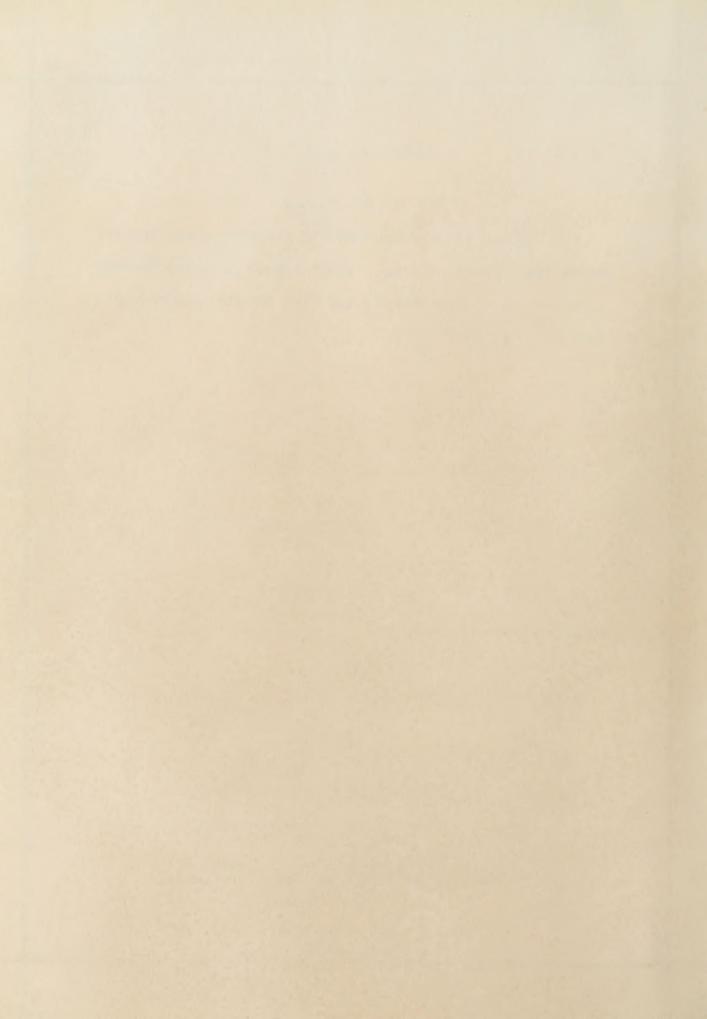
Shine ran a bout crying::

My mother is lost Men Men

I want my mother i do I do

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Fig. 1. Reading Material Copied from Books



Floer nce Muleranka

I have a little dog.

He is brown black and white.

He can run fast.

He can sit up and beg.

Has name is Toto.

Fig. 2. Child's Copy of Class Composition.

CHARLES

CHARLES

CHARLES

CHARLES

The li ttle robin came..

from the blue eggs.

The little robin gro.,

Thoe little robins fly.,

Autumn is here.,

The robins fly away.,

The su n shines.,

The su n shines in the day,.

The sky is blue, ...

Fig. 3. Reading Material Copied from a Book.



Now the morning has begun'.

ZGood morning sun!

Good morning sun!

See me wash my hands and face,

See me tie my to shoe lace.

What are we drinking

to help me grow up?

Look in ourglasses

and Baby Anns cup.

What shall we have in

Fig. 4. Poem Copied from a Book.

Nancy koromohilah.
Breakfast is very goood.

we drink our milk.

Here we are at school.

we play ourt of doo rs.

soo n we are with Dr. Lee.

He looks at our teeth.

we wash our hands and help.

Bill carr ies in the milk..

wehave fun with Dadd y.

Taffy havs fun, too.

A *Fe riend.

Fig. 5. Story Copied from Health Book.



Argero Stamos.

Ned and Nancy.

Good morning, Mother.
We have brushed our teeth.
We have washed our faces.
We have washed our hands.
We have ready for breakfast...

A Good Breakfast.

Ned and Nancy had a good breakfast. They had fruit for breakfast. They had Maltex Cereal.

They had milk and toast.

Ned and Nancy liked their breakfast.

Going too School

Look Look 'said Nancy.

The light is, red.
We must stop.

We must stop.,

Bew the light is green, said Ned.
We may go across the street.
We mustclook both ways.

In School
Ned and Nancy like to go to school.
They like to read.
They like to draw pictures.
They like to work and play.
Ned and Nancy are happy twins.

Fig. 6. Reading Material Copied from Book.



Burnhs School, Hartford, Conn. March 23, 1945.

Dear Mother:-

I liked my party last night. Miss
Dowd liked my birthday cake.
Wanda Blajda

Fig. 7. First Copy of Original Letter.

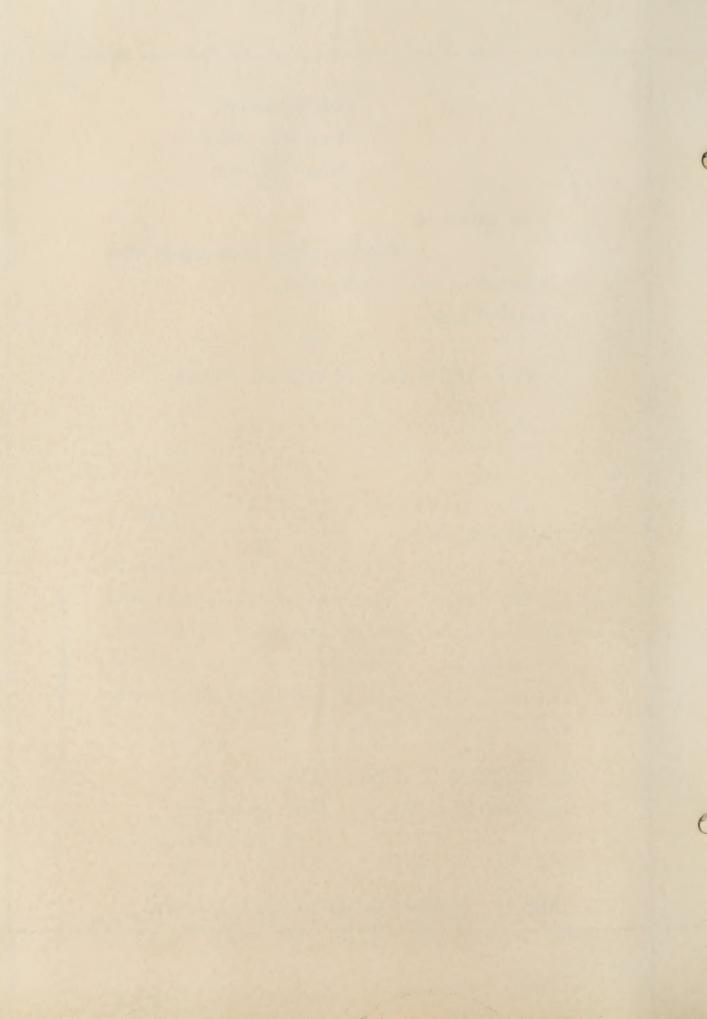
Wednesday APril 4 1945 Dearmr .Mr Judd:

In like to type ewrite becausee it is fun. I like to type stories. Ilike you very much. I like to type my numbers. It is fun to typewrite. I type with two fingers. I have learned the alphabet. I like to type my numbers. I can spell some of the words.

Alphabet. I like to type my lesson.

Florence Muleranka

Fig. 8. Original Letter to the Principal.



Boys and Girls in Room 10 6.

you are irvited to come

to hear us say our Mother

Goose Rhymes next Tuesday

afternoon at 2 o' clock.

Rooml10.

Gerald Shorey.

Fig. 9. Child's Copy of Invitation Composed by the Class.

Burns School, Hartford, conn March 23; 1945

Dear Mother: -

I want a Easter basket and yellow dress.

for Easter and Show my teachershow my dress.

and please have a good party to-morrow.

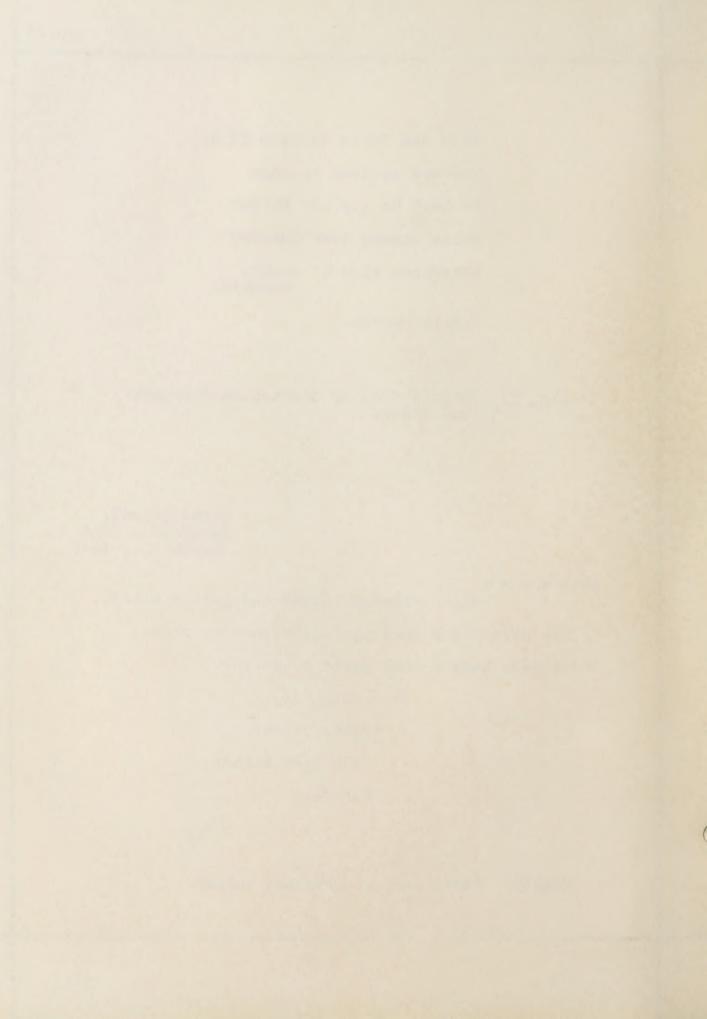
Your daughter,

Argero Stamos.

472 Park Street

Hartford

Fig. 10. First Copy of Original Letter.



Floernce

My Dol 1

My doll is dress, in a red and white dress.

I call her Eva. Eva hes white SShoes.

She had brown hair.

8.

I am seven years old.

my Father gave me seven ducks they are candles.

b.

Sadie Sarkii sian

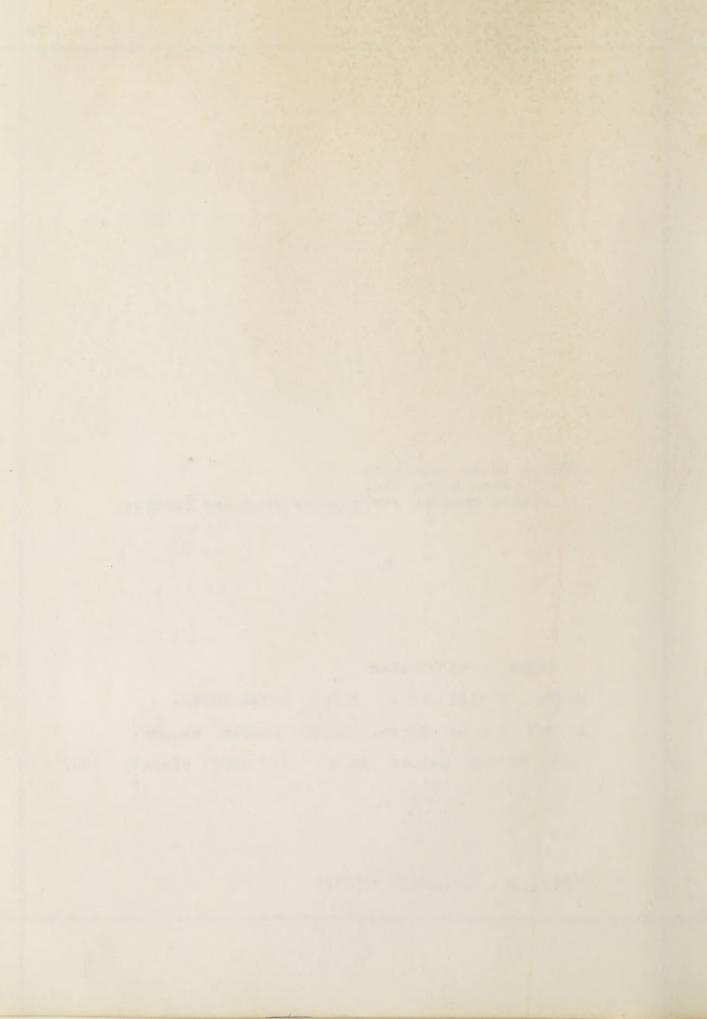
Maybe I will be a r Red Cross Nurse.

A Red Cross Nurse. Helps people athome.

Sehe helops people in c far away places, too.

0.

Fig. 11. Original Stories.



Argero Stamos.

My Pet

I have a cat.
His name is chubby/
He can do the somersault.
He plays with his mother.
His mother washes his.
They have lots of fun.

8.

Wanda Blajda.

Ea ster.

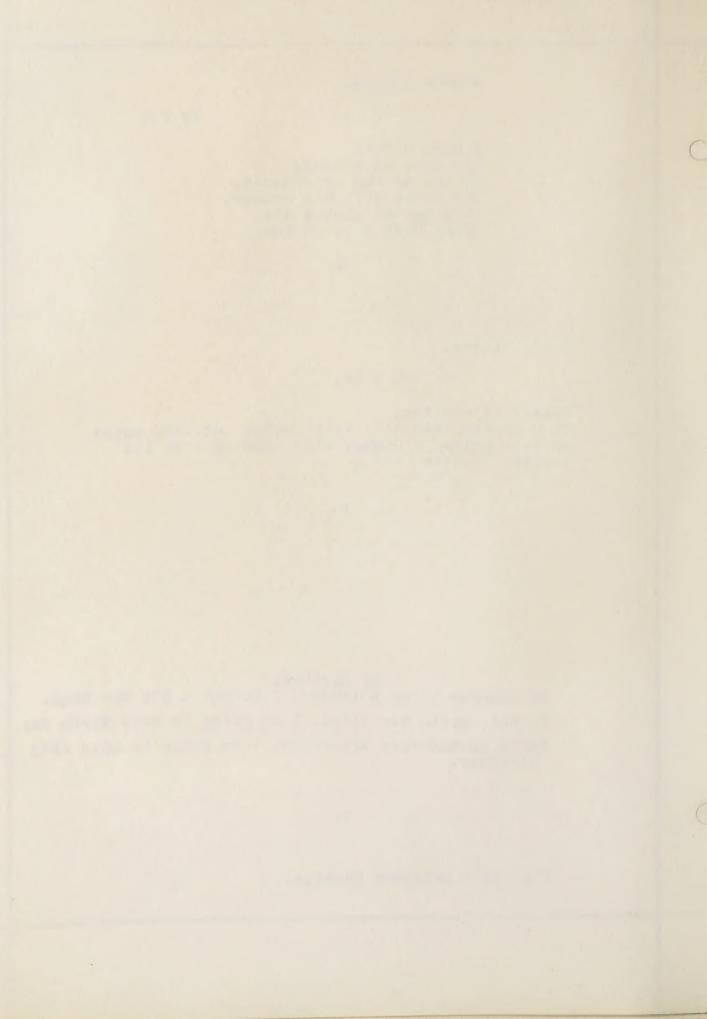
Easter is com ing.
The Easter rab bit will bring colored eggs
He will bring a bakket with some eggs in itt
Imlikee Fester day.

b.

My Birthday
to -morrow is my B irtday. I bought a \$75 War Bond.
I was given two slips. I am going to have Birth day
Party on Saturday afternoon. I am going to have abig
birthday.

0.

Fig. 12. Original Stories.



Nancy Koromonian.

My Doll

My doll hastwo dresses.

My doll s name is Nancy.

Nancy has two new hats. My

She gotthem for Easter.

She has a carriage.

I giive herlots of rides.

.

Betty

My doll vclothes.

I like to sew for my doll.

I can make her dresses.

I made two dresses.

They are yellow and red,

It was fun.

b.

Argero Stamos.

Easter Eggs.

We colored Some eggs.

They are very pretty.

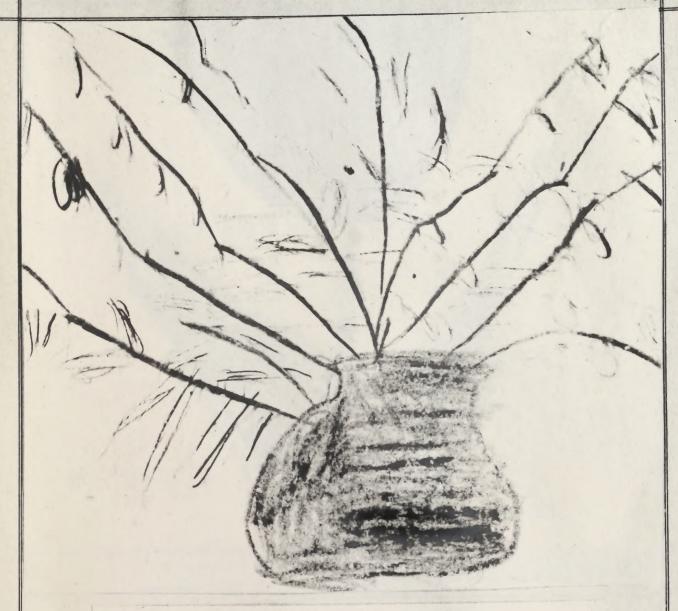
Some are red.

Som are blue.

It is fun to color eggs.
We will eat them on Easter morrning.

.c.

Fig. 13. Original Stories.



These are pussy-willows.

They aregray.

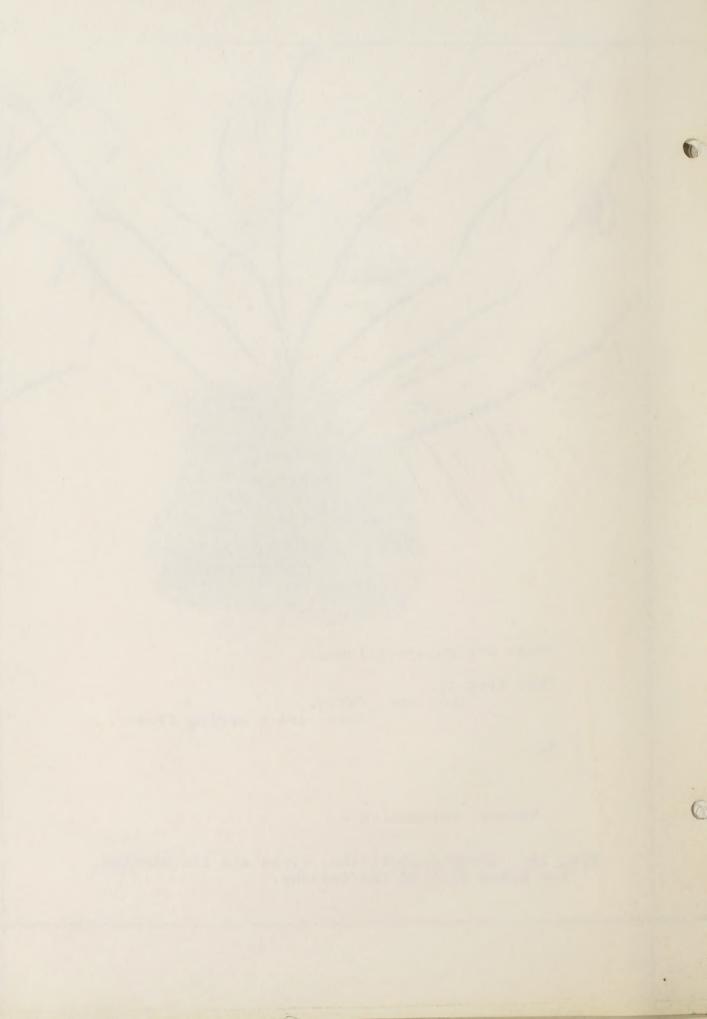
They are fuzzy.

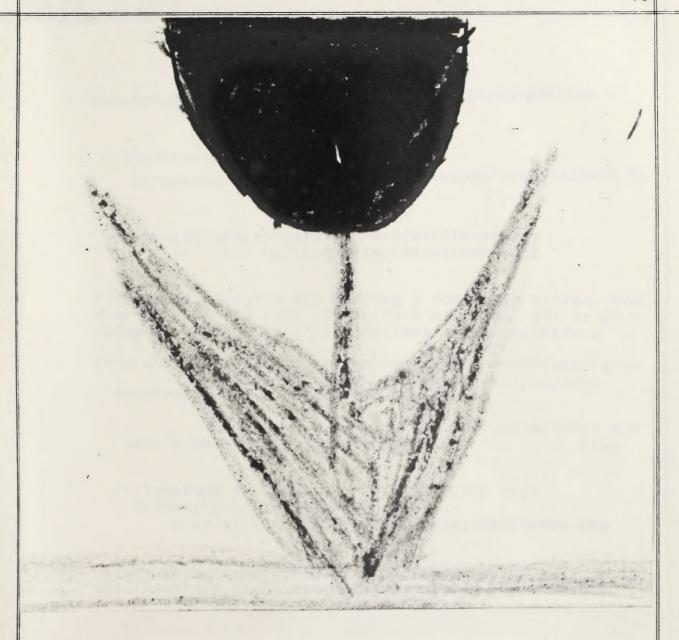
They are a spring flower.

Na

Nanccy koromohiah .

Fig. 14. Group Composition, Typed and Illustrated, For Class Book of the Seasons.





This is a tulip.
Tulip blossom in spring.
Tulip are many colors.
Tu lip have no odor.

Wanda Blajda.

Fig. 15. Another Contribution to the Class Booklet.



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Fig. 16. Random Experimentation with the Machine.

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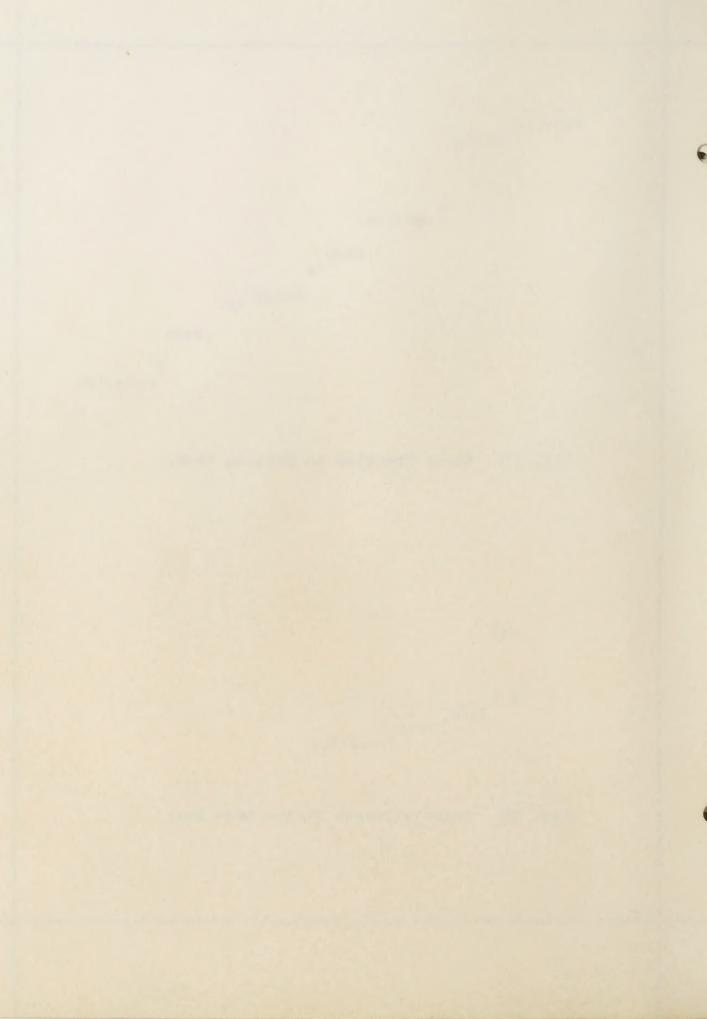
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Fig. 17. Early Practice in Writing Name.

FrE

Fred Frederick

Fig. 18. Later Attempts by the Same Boy.



Wanda Blajda.

Susan likes the rain.

Bob likes fog.

Susan and Bob like the sun.

Chilsren like snow.

The apple TREE in autum n.

The Apple tree in winter.

The Apple tree

8.

Sadie Sarkisian

March

March is the third month

March has 31. days 1.

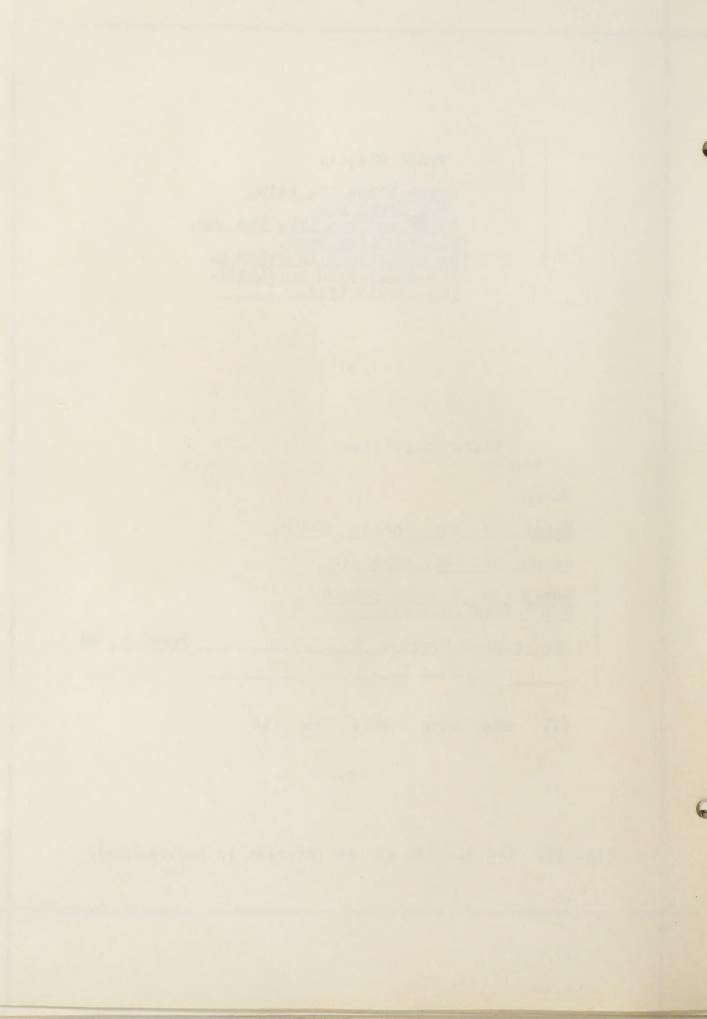
March is a cold month.
The wind blows.

BP ringon Comes. L D on March 2 MM

All The snow Will me lt

b.

Fig. 19. Two Samples of the Interest in Underlining.



Sadie Saarkisian

House uR u les

No running

T
T
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Fig. 20. Early Interest in Copying Material from the Board.

THE FINS OUT BOOK

VOLUME ONE KOPTYUEDFCZYHJChO

A HAPP y DAy We GeJ Up lrgkijhybvofr Taffy has fin, too.

Tajjy has, vonjoo. 17yhgtvbcfdaaszxdfcghhh

cPcPejyeikjhfgggggggggggggggggGGygfhvb,

Fig. 21. First Experience in Copying "Just Anything" from a Book.

Sadie

Sarkisian

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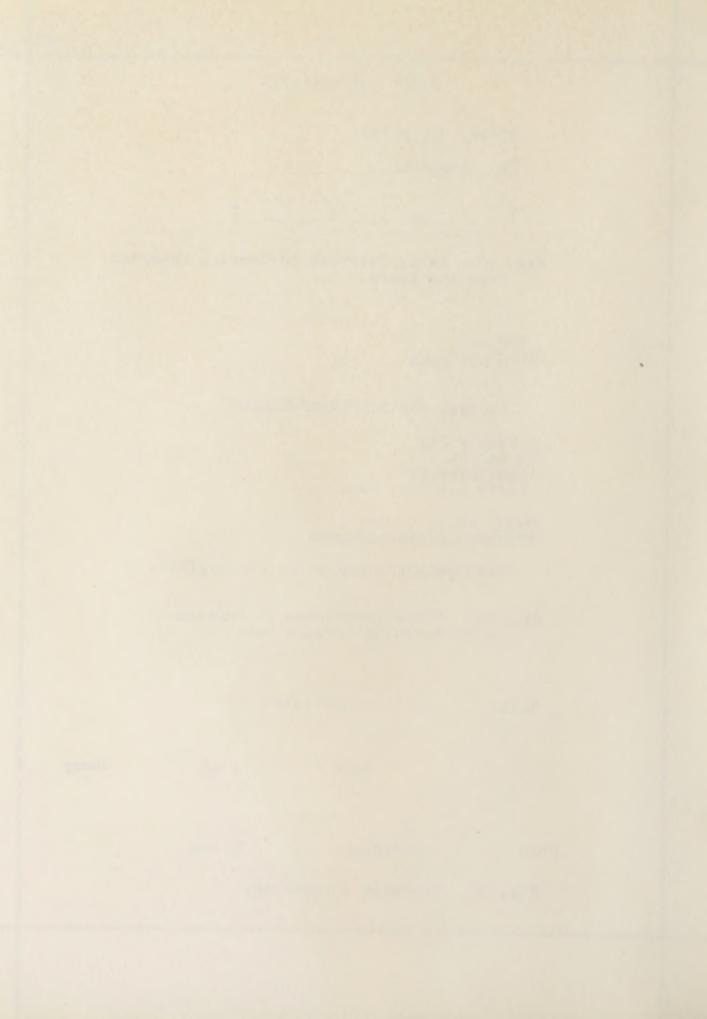
Nancy

Good

morning

Motyh

Fig. 22. Practice in Spacing.



a prett y green house

at the window

in the pretty green house

a green house

Father 's home

8.

Argero Stamos.

at do go I he in is it me my of onto up we all and are big can for his not one out she see the was you have that them they went what will with about there which little.

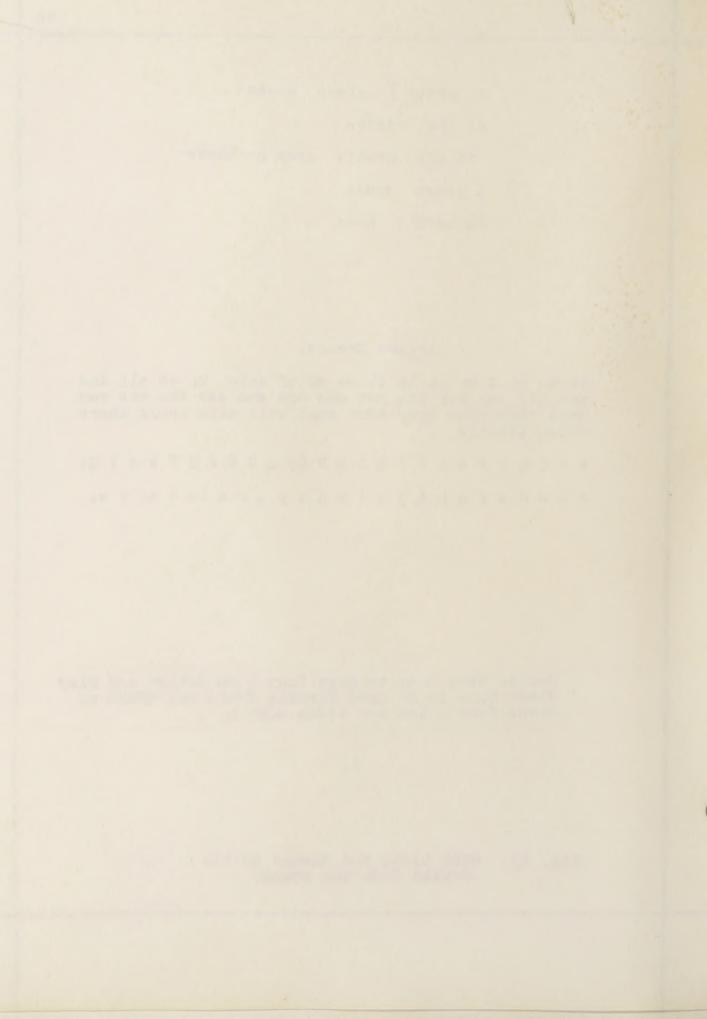
ABCDEFGHIJKLMN OP QRSTUV WXYZ.
abcdefghijklmnopqrstuv wxyz.

b,.

Mother Baby Come to Mary Tony I am Father and play Sleep like We Go Good Morning Every Day Wash my hands face clean our teeth comb h

C.

Fig. 23. Word Lists and Phrase Drills Copied from the Board.



we	one 1
me	too 2
Good-by	three 3
Motherr	fo# 4
baby	five 5
род	six 6

Fig. 24. Relation of Numerals to Words.
Notice the Child's Early Attempt at Spelling.

The is i's the city.

This is to m, sg r andm o ther.
Grandmother, shome is.

in the country.

to come to the country.

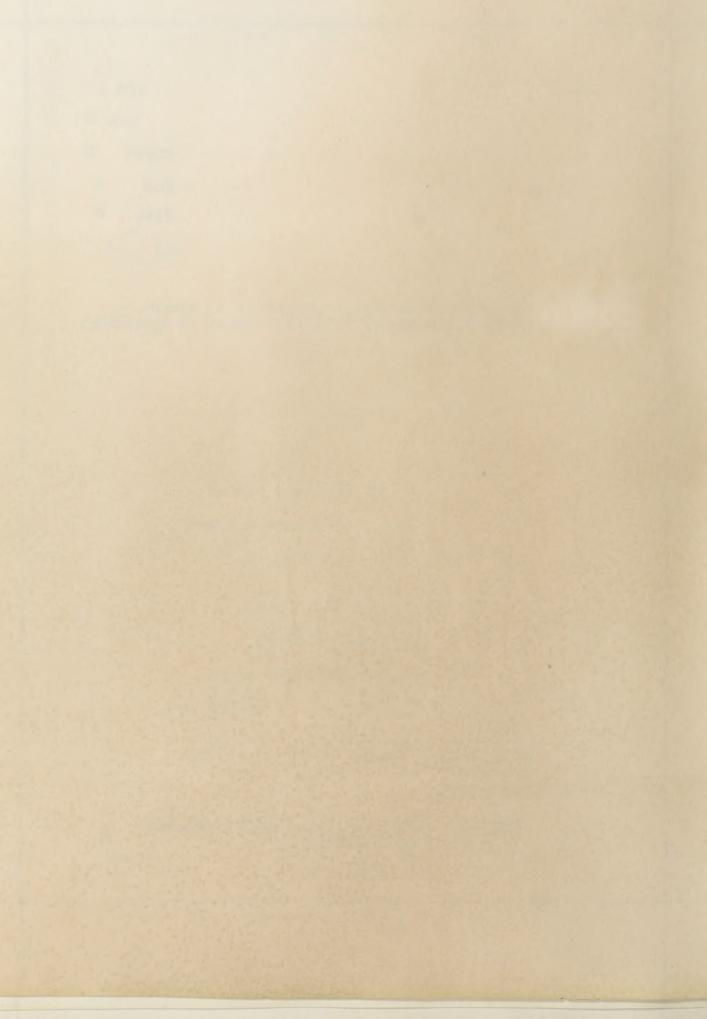
Gran dmoth er wro te a lett er.

Gram dm o th er w rot e a l ett er.

to To m.
Th is i's Grand mo ther, sletter.

Dear Tom.

Fig. 25. Child's Unsuccessful Attempt to Find an "Apostrophe".



Michel Hisz JR

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17
18 19 20 21 22 23 24 25 26 27 28 29 30 31
32 33 34 35 36 37 38 39 40 41 42 43 44 45
46 47 48 49 50 51 52 53 54 55 56 57 58 59
60 61 62 63 64 65 66 67 68 69 70 71 72 73
74 75 76 77 78 79 8 0 81 82 83 84 85 86 87
88 89 90 91 92 93 944 95 96 97 98 99 100

Fig. 26. Practice on Counting with Correct Spacing.

Gerald Shorey.

Breakfast is very good.

Breaka

Breaky

Breal

Breal

Breal

Breaky

Breal

Breal

Breakl

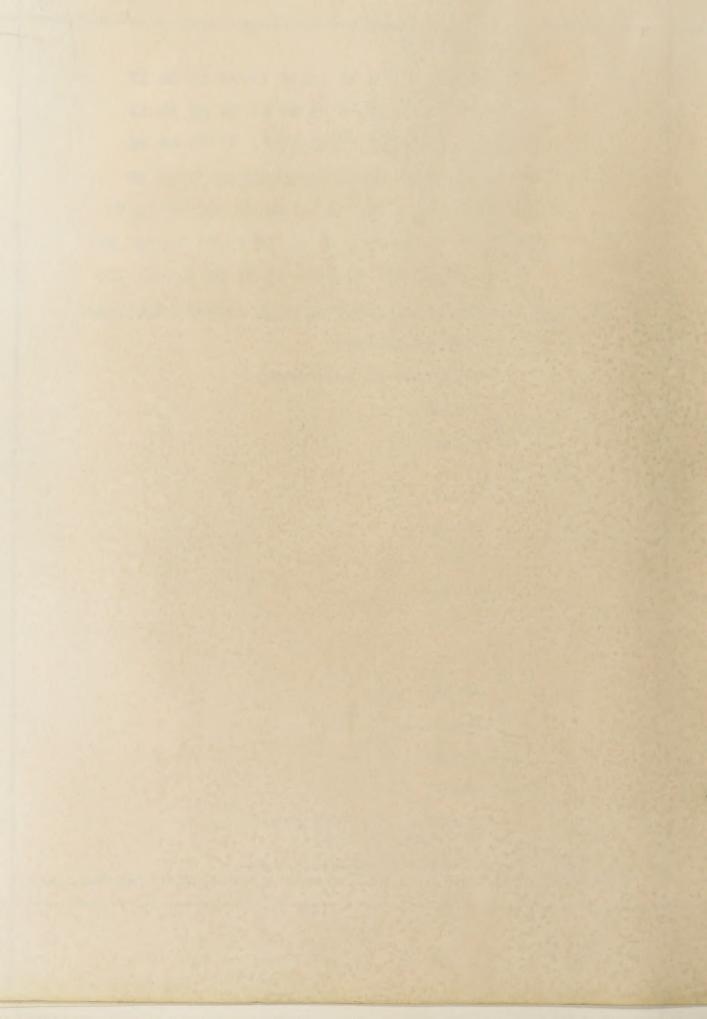
Breakt

Breakt

BreakT

Breakfast is very good. We drink oar milk.

Fig. 27. A Sample of Perseverance.
Continued Practice on a Word Until Correct Spelling Resulted.



Argero Stamos.

Right Hand Practice

in look him look him look him look him look his here from look was look look was look look was look look look look look look look loo				
Left Band Bractice We at get as see are were was better be water Two-Hahd Practice all do ran it may with out for call to old long by and want did let away had say who her he help its man make so have over tell but them two his mean here from again toe play come well one take your she v why big that this nowthem them came is boy down me there when of just made tun into some time went thank	in	look		
We as see are were was better saw be water Two-Hahd Practice all do ran it may with out for call to old long by and want did let away had say who her he help its man make so have over tell but them two his mean here from again toe play come well one take your she v why big that this nowthem there when of just made the they please run into some time went thank	th's	nhim		
We as see are were was better saw be water Two-Hahd Practice all do ran it may with out for call to old long by and want did let away had say who her he help its man make so have over tell but them two his mean here from again toe play come well one take your she v why big that this nowthem there when of just made the they please run into some time went thank	Taft I	bond	Prooffee	
as see are was better saw be water Two-Hahd Practice all do ran it may with out for call to old long by and want did let away had say who her he help its man make so have over tell but them two his mean here from again toe play come well one take your she v why big that this nowthem them came is boy down me there when of just made the they please run into some take went thank		ranu		- get
were saw be water Two-Hahd Practice all / do ran it may with out for call to old long by and want did let away had say who her he help its man make so have over tell but them two his mean here from again toe play come well one take your she v why big that this nowthem them came is boy down me there when of just made run into some take please run into some thank				
all do ran it may with out for call to old long by and want did let away had say who her he help its man make so have over tell but them two his mean here from again toe play come well one take your she v why big that this nowthem there when of just made the they please run into some time went thank				
all do ran it may with out for call to old long by and want did let away had say who her he help its man make so have over tell but them two his mean here from again toe play come well one take your she v why big that this nowthem them came is boy down me there when of just made the they please run into some time went thank				
all do ran it may with out for call to old long by and want did let away had say who her he help its man make so have over tell but them two his mean here from again toe play come well one take your she v why big that this nowthem them came is boy down me there when of just made the they please run into some time went thank	54.11			
it may with out for call to old long by and want did let away had say who her he help its man make so have over tell but them two his mean here from again toe play come well one take your she v why big that this nowthem them came is boy down me there when of just made the they please run into some time went thank				
out for call to old long by and want did let away had say who her he help its man make so have over tell but them two his mean here from again toe play come well one take your she v why big that this nowthem them came is boy down me there when of just made the they please run into some time went thank		d	lo	ran
to old long by and want did let away had say who her he help its man make so have over tell but them two his mean here from again toe play come well one take your she v why big that this nowthem them came is boy down me there when of just made the they please run into some time went thank	it			with
by and want did let away had say who her he help its man make so have over tell but them two his mean here from again toe play come well one take your she v why big that this nowthem them came is boy down me there when of just made run into some time went thank	out			call
did let away had say who her he help its man make so have over tell but them two his mean here from again toe play come well one take your she v why big that this nowthem them came is boy down me there when of just made the they please run into some time went thank	to			long
had say who her he help its man make so have over tell but them two his mean here from again toe play come well one take your she v why big that this nowthem them came is boy down me there when of just made the they please run into some time went thank				want
her he help its man make so have over tell but them two his mean here from again toe play come well one take your she v why big that this nowthem them came is boy down me there when of just made the they please run into some time went thank		10	t	
its man make so have over tell but them two his mean here from again toe play come well one take your she v why big that this nowthem them came is boy down me there when of just made the they please run into some time went thank				
tell but them two his mean here from again toe play come well one take your she v why big that this nowthem them came is boy down me there when of just made the they please run into some time went them				
tell but them two his mean here from again toe play come well one take your she v why big that this nowthem them came is boy down me there when of just made the they please run into some time went thank	its			
two his mean here from again toe play come well one take your she v why big that this nowthem them came is boy down me there when of just made the they please run into some time went thank				
here from again toe play come well one take your she v why big that this nowthem them came is boy down me there when of just made the they please run into some time went thank			The state of the s	them
toe play come well one take your she v why big that this nowthem them came is boy down me there when of just made the they please run into some time went thank	two			
well one take your she v why big that this nowthem them came is boy down me there when of just made the they please run into some time went thank				
your she v why big that this nowthem them came is boy down me there when of just made the they please run into some time went thank		F	lay	
big that this nowthem them came is boy down me there when of just made the they please run into some time went thank				
nowthem them came is boy down me there when of just made the they please run into some time went thank				
is boy down me there when of just made the they please run into some time went thank				this
me there when of just made the they please run into some time went thank	nowthem		them	came
me there when of just made the they please run into some time went thank		h		d a sum
of just made the they please run into some time went thank				
the they please run into some time went thank				
run into some time went thank				
time went thank				
		11		
MOUTO TOTIE MITGLE				
can what house				
will must said				
could	WITI		maso	

Fig. 28. Practice Exercises for Hand Drills.



Ge5ald Srehy.
123446789101. lo 18 16 1213 1415661718191761 11 17 19 ol
1841615 75855667434278348878881990 89 78 67 564534238101
099897 867253554 5556 55 56 57 58 5964577 82 5786 8 9
8799100

Fig. 29. Early Experience with Counting.

Gerald Shorey.

1 2 3 4 5 6 7 8 9 10 11 12 3

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23: 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 5051 56 57 5

50 51 525 3

Fig. 30. Successful Counting with Spacing.

Gerald Shorey.

Alice sai6 lysee some ahimals.

Aleiklas lixdi lkds ih jhe ciJy. J00

Alice saidf erfdgujhikl ddoAdrefgyj kdyuhokj

Sdasejuiokjusefc

Fig. 31. First Attempt to Copy Material from Book.

Gerald Shorey.

My Book

I have a book.

I like the book.

I can read it.

I t is-a red book.

It is calle d 'The Little Engine That Coun, id.

Fig. 32. Recent Original Composition.



samulel Aliano InSchool Ned and Nancy

They like to read.

They lilkee eto drawq (qictures,)

Thtey likke to wwork and qlay,

NNed and NN Nancy are haqq y twwins.

Going to School

LOOk, 100k, Said Nancy NEed.

Fig. 33. Reversal of Letter Forms.

Sam uel Aliano

ln School

Ned and Nancy like to go to

School. They like to read.

They like to drawpictures.

They like tow ork andplay.

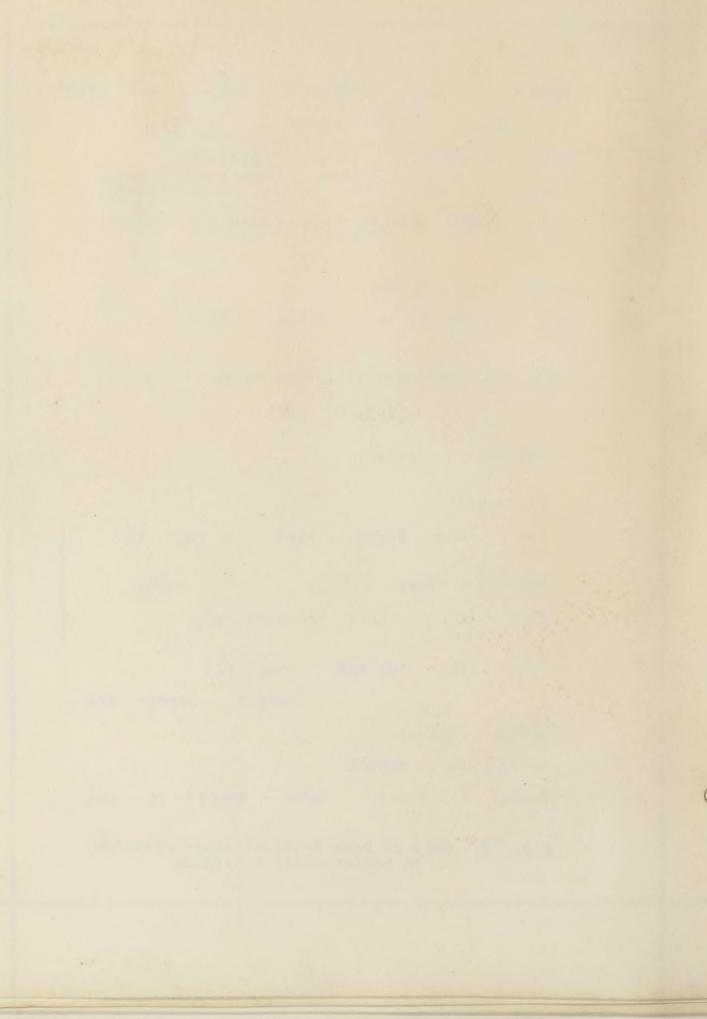
Nedand Nancy are

happy twins,

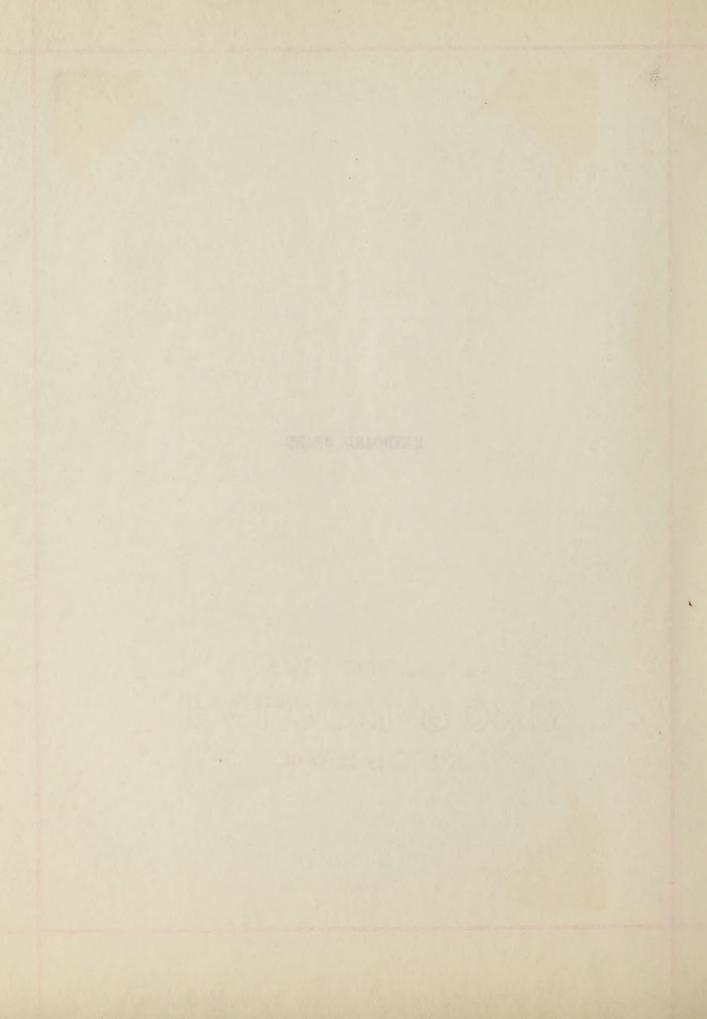
Going to School

Look. look. Said Nancy to Ned.

Fig. 34. Copy of Same Material After Practice on Letter Discrimination.



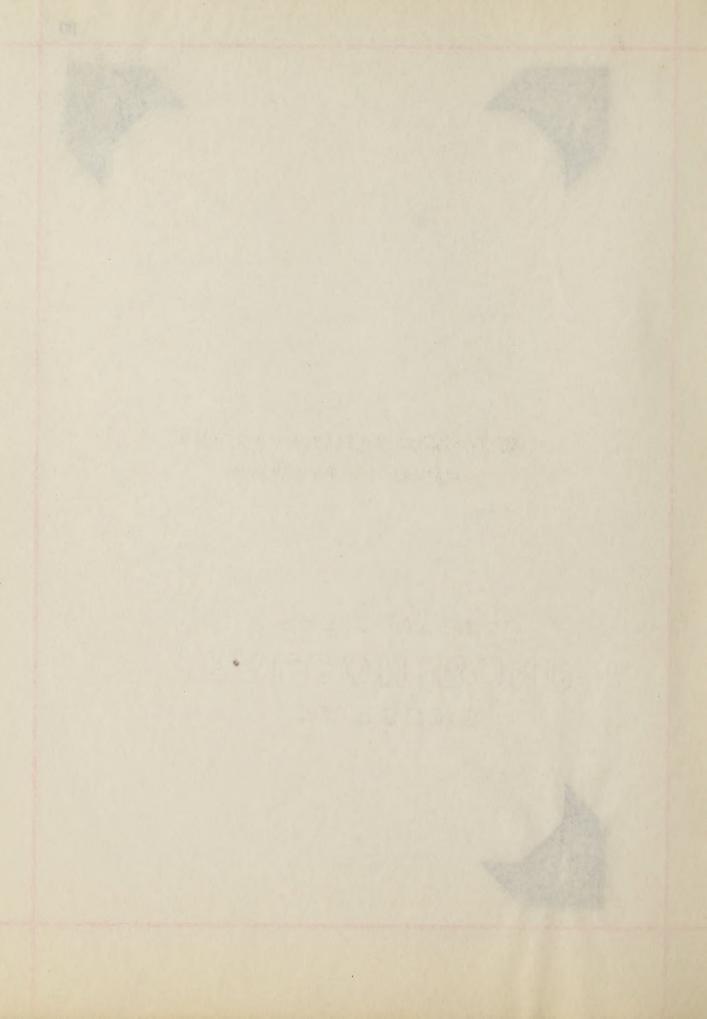
KEYBOARD CHART











DURRELL-SULLIVAN REMEDIAL VOCABULARY

ARRANGED FOR HAND DRILLS

CALLER MAN THE TROUBLE THE MENT

Practice Words for the Typewriter

These words are from the Durrell-Sullivan Remedial Reading
Vocabulary List. (Primer and Low First Grade.)

Right				
onavelticus	-	-	-	Brancisk (Office

in up look him my you on no

Left Hand Practice

we at was are as see be better were saw get water

Two-Hand Practice

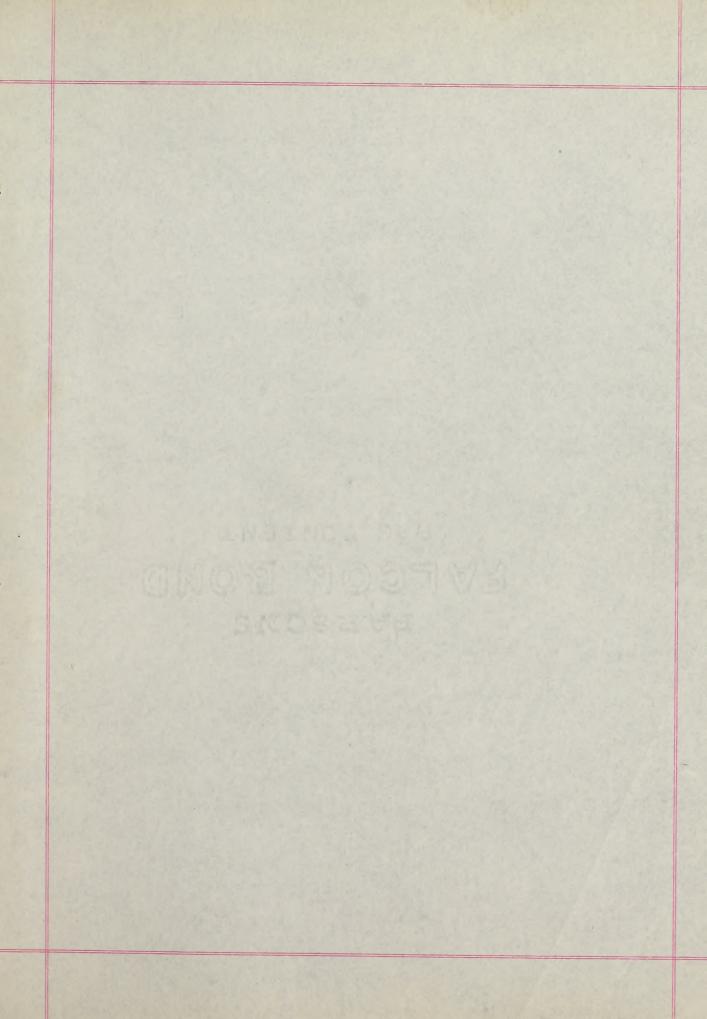
good all run give it time them come would take out boy to there Why can just will this by did do they many had may into back her for went came its old long down and what when 80 tell let made must two please ran say here with he some put man call thank long toe have where well but Want house his away your said big from who could now not help like play make 18 one me over she then of that mean the an again

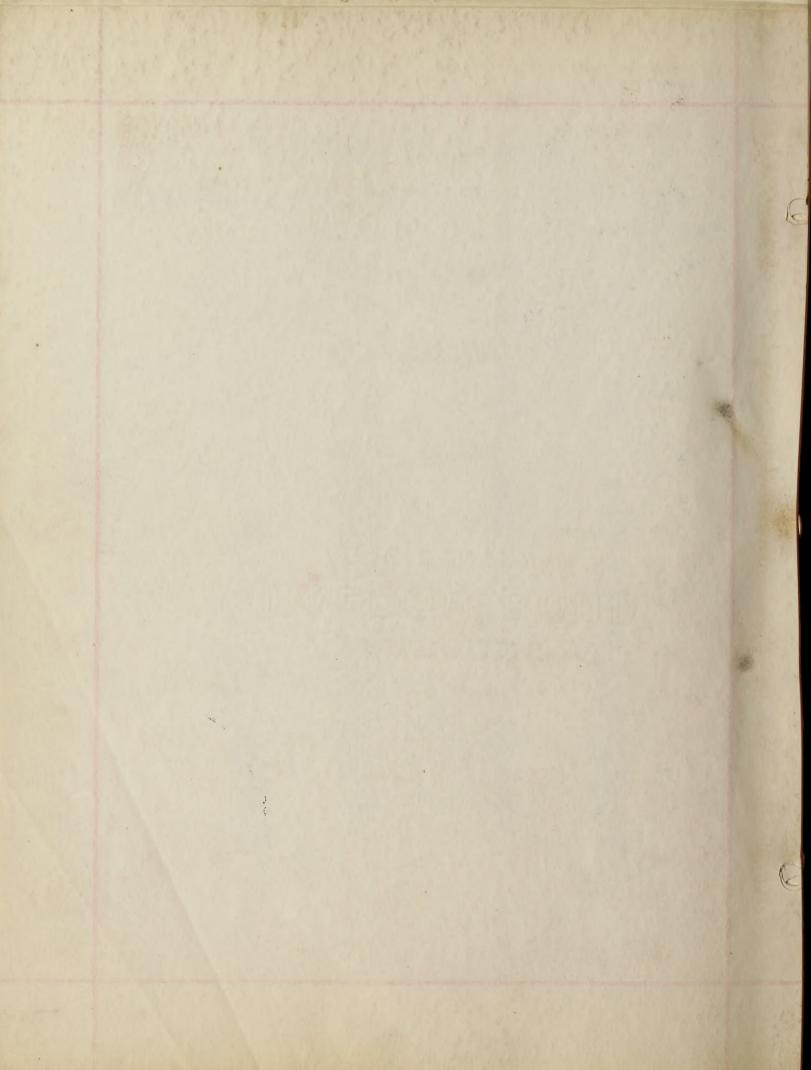
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