VISIBLE LANGUAGE

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197—224 Reading Before Speaking
Danny D. Steinberg and Miho T. Steinberg

225—248 Acquisition of Writing Skills
Roy A. Moxley, Jr.

249—262 Line Transmitter Installation—A Poem in the Environment
Mark Mendel

263—275 Methods of Research in Renaissance Manuscripts
Paul Oskar Kristeller

277—281 Comment: The Medial Aspect of Language: A Linguistic Framework for Literacy
John Mountford

282—284 Correspondence

285—287 Abstracts of Journal Articles in French and German

288 The Authors

Cover: VISIBLE LANGUAGE in the Bacteroid Alphabet developed by microbiologists Alan S. Craig and K. L. Giles of the New Zealand Department of Scientific and Industrial Research. Additional comment on inside back cover.

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Reading Before Speaking

Danny D. Steinberg and Miho T. Steinberg

It is generally believed children are not ready to read until about 5 years and that speech production is a necessary and desirable basis for a teaching methodology. In this study, a four-phase program—*Alphabet Familiarization; Alphabet Identification; Word, Phrase, & Sentence Identification;* and *Text Reading*—was administered to a subject, beginning at 6 months of age. Significant reading skills were acquired during the subject's pre-speech period. By 3½ years the subject read short sentences fluently, and by 8 years, his speed and accuracy equalled eleventh graders. A mongoloid child administered the program at a later age now (at 5 years) reads 48 words and 5 phrases and sentences. It is concluded that most current notions on reading readiness and on the role of speech production in teaching methodology require reconsideration.

This paper is concerned with the question of when and how a child should be taught to read. The linguist Leonard Bloomfield (1961) expressed the view of reading held today by most people, lay and professional, when he stated:

> In order to read alphabetic writing one must have an ingrained habit of producing the phonemes of one's language when one sees the written marks which conventionally represent these phonemes. A well-trained reader, of course, for the most part reads silently, but we shall do better for the present to ignore this fact, as we know the child learns first to read aloud. . . . *Alphabetic writing merely directs the reader to produce certain speech sounds. A person who cannot produce these sounds cannot get the message of a piece of alphabetic writing.* If a child has not learned to utter the speech sounds of our language, the only sensible course is to postpone reading until he has learned to speak. (p. 26-7, our italics.)

A view similar to Bloomfield's is held by the language philosopher, Ryle (1949), who has stated that,

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> . . . talking to oneself in silence is acquired neither quickly nor without effort; and it is a necessary condition of our acquiring it that we should have previously learned to talk intelligently aloud and have heard and understood other people doing so. . . . Similarly, *a boy has to learn to read aloud before he learns to read under his breath*, and to prattle aloud before he prattles to himself. (p. 27, our italics.)

Thus, it is advocated that the teaching of reading must wait until the child has gained relatively complete mastery of his language, both in production and understanding. The child is taught to read aloud, and then silently. Although such assumptions regarding the nature and teaching of reading are prevalent, no empirical research actually has been provided which could be said to establish these theses (see Durkin, 1968, for a survey of literature on early reading).

The possibility that such views could well be false, occurs to us because of two propositions which we hold valid: (1) the essence of the reading process is the acquiring of meaning or understanding through the medium of visual materials (i.e., orthography) and (2) language understanding on the part of children learning a language always precedes language production (i.e., speech production lags behind). We reason that if children can understand speech to some extent even though they cannot produce it, then, why could they not be taught to recognize the orthographic representations of that speech? Such a conception reverses the accepted learning procedure by teaching the child to read silently before he learns to read aloud.

The investigation which we report here concerns our efforts to teach a young child to read in just this fashion. The administration of our reading program began when the subject *(S)* was 6 months of age. At this age the *S* could not speak but could understand some words spoken to him.

Method

Subject & Experimenters. The *S*, whose name is Kimio (hereafter *K*), was born in January, 1964. An only child, he appeared bright and alert and his physical development was normal. His speech development was perhaps a little below normal in his early years.

At 12 months he could say only four distinguishable words and at 24 months only about 25 single words and a couple of two-word utterances could be produced. At about 30 months, however, he began to acquire advanced structures and vocabulary quite rapidly so that by his third year his speech production ability was somewhat above normal.

The experimenters (*E*s) are *K*'s parents, and the authors of this paper. Both are university lecturers with a professional interest in language. They designed the reading program (outlined below) which they began to administer to *K* when he was 6 months. The program was terminated about 4 years later by which time the essential goals had been achieved.

K's Language Environment. *K* was raised in a mainly English-speaking environment. Occasionally, Japanese was spoken by his mother and other Japanese speakers, particularly his uncle who was a member of the same household during *K*'s 1 to 2 years.

K was introduced to books early in life. He was given books of cloth or plastic to play with as early as 6 months. The *E*s would stimulate *K*'s interest in such books, which for the most part consisted of pictures, by looking through the book with him and commenting on the pictures. Later when *K* appeared to understand language, they began to read to him regularly, usually at bedtime. Like most children, *K* enjoyed having books read to him.

When possible, the *E*s exploited the appearance of letters in the natural environment. Letters which appeared on television, in newspapers and magazines, on labels and boxes, and on signs were drawn to *K*'s attention and named. Since such occurrences in the world at large never failed to excite *K*, he was only too happy to point in response to a question like "Where is Ay?" *K* was similarly delighted to have a set of plastic letters (with magnetic backs) and letter blocks to play with.

The *E*s also initiated library visits to provide a source of stimulation and encouragement for *K*. *K* was started at the library when he was 32 months. Going to the library and taking out books became a regular weekly activity.

Procedure. The reading program is divided into four procedural phases: (1) *Alphabet Familiarization,* (2) *Alphabet Identification,* (3) *Word, Phrase, and Sentence Identification,* and (4) *Text Reading.* It cannot be overemphasized that throughout the program the *E*s attempted to foster a positive attitude towards reading and learning to read on the part of *K*. Learning sessions were approached as games and not serious lessons. Sessions were generally brief, just a minute or two in length. They were conducted anywhere (bedroom, bathroom, or kitchen), any time (night or day), and under any condition; e.g., while *K* was walking or having his diapers changed. An activity was discontinued whenever *K*'s attention began to wander or it looked as though he might soon begin to tire of it. Encouragement and praise were never spared.

Phase 1: Alphabet Familiarization. The purpose of this phase was to familiarize *K* with the shapes of letters. Familiarization is intended to establish a perceptual basis for distinguishing among the variety of visual shapes which letters exhibit. This would prepare *K* for the next phase where he would have to learn to discriminate individual letters from one another.

The phase was initiated during *K*'s sixth month, at which time he could sit with support, could recognize familiar faces, and understand the names of some familiar objects. Since only familiarization is the goal, having even this minimal degree of language (understanding names) might not be considered a necessary prerequisite to initiating this phase. *K* could not speak, nor was it necessary for him to be able to.

The upper-case letters, 2 inches in height, were printed in red with a felt-tipped pen on two strips of white paper (3 inches x 24 inches) and taped inside the footboard of *K*'s crib. The lower-case letters were printed on similar strips of paper and taped to the headboard of the crib. The lower-case letters were 1 inch (for a, c, m, etc.) or 1½ inches (for b, t, j, etc.) in height. The style of print which is prevalent in most children's books is the one which was used. Thus, the lower-case of the first letter of the alphabet was printed as 'a' and not 'ɑ'. Similarly, the lower-case of G was printed as 'g' and not 'ɡ'. All letters were positioned along a pencil line in order that the orientation of the letters with respect to a base line would be apparent.

Because *K* would tear and lick the letter strips, it became necessary to tape the strips securely to the crib and cover them with transparent tape. In all, the strips had to be replaced three or four times because of wear. Following the first replacement, all letters were printed in black instead of red. Since black is typically the color of type, it was thought that familiarity with letters of this color might be helpful. The format of the strips was also changed; upper- and lower-case forms of the same letter were printed next to each other on the same strip (A a B b C c, etc.). In this way, the differences between upper- and lower-case letters were highlighted. This format was retained throughout this phase and the succeeding phase.

Several times a day the *E*s would point to various letters and pronounce the (usual) names of these letters ("Ay," "Dee," "Ex," etc.). This was done in order to direct *K*'s attention to particular letters. The *E*s attempted to select and name letters at random to avoid favoring certain letters and letter sequences. Letter names were used only for purposes relating to identification; i.e., to help teach *K* visually to discriminate letters and to test this differentiation. Purposely, no attempt was made to teach *K* the various sound correspondences of individual letters. Such an endeavor was viewed as an unnecessary complication and an impediment to learning to read. It was expected that *K* would induce sound correspondences on his own relatively effortlessly as his reading repertoire increased.

To further draw attention to each letter and also to teach *K* to point (a skill used in the next phase), *K*'s finger was sometimes held and pointed to a letter as it was named. Sessions usually lasted from two to five minutes, and generally totalled no more than ten minutes per day.

Phase 2: Alphabet Identification. In the second phase *K* was to learn to discriminate letters visually. Since the acquisition of this knowledge was to be tested by having *K* point (with fist or fingers) to letters which were named, *K* was considered ready to begin this phase when he could point to an object in response to hearing its name. *K* was in his eighth month when he was considered ready. At that time he could consistently point or look toward his father in response to "Where's Daddy?" or touch his stuffed clown in response to "Where's Mister Clown?"

Sessions of the second phase generally proceeded as follows: the *E*s would ask a question such as "Where is Vee [V]?" and then help *K* to respond by pointing his finger to the letter, saying, "Here is Vee." Then they would repeat the question and pause to let *K* point to the letter. Whenever he gave a correct response, he would be rewarded as much as possible with words and actions such as "Perfect!", "Right!", or a smile or a hug. While at first *K* required assistance in making the pointing response, later he was able to make the response on his own. When he made mistakes in pointing, as he frequently did at first, the *E*s would take his finger and point it at the correct letter. Eventually *K* learned to point to letters simply on the basis of their names, without first having the *E*s point them out. Each session, of which there were generally 4 or 5 per day, lasted 3 to 5 minutes. A total of 20 minutes per day was rarely exceeded.

Phase 3: Word, Phrase and Sentence Identification. The aim of this third and most critical phase was to teach *K* to identify the orthographic representation of words, phrases, and sentences. If *K* could *understand* the meaning of a word, phrase, or sentence that was spoken to him, he was considered ready to learn to read it; i.e., to identify the orthographic form of those items.

At 10 months *K* showed that he understood several words and phrases; e.g., he reacted to "Shall we go bye-bye?" by rushing to the door, and when he heard "No, Kimio" he would stop what he was doing. There were several objects which he could identify by pointing to them in response to questions of the form "Where is ___?" Consequently, *K* was considered ready to begin learning to read those words, phrases, and sentences which he understood. It should be emphasized that it was *not* considered necessary for *K* to be able to say these items in order to learn to read them.

The crucial aspect of this phase involves the learning of the first word. Until now *K* has learned that certain speech sounds are used to refer to certain objects in the environment; e.g., that the speech sound "boy" and the object 'boy' are associated, and that the speech sound "Ay" and the visual object 'A' are associated. What must be learned next is that certain combinations of letters are used to represent certain words of the language and their meanings.

In order to suggest a close relationship between object and printed word and to set up a situation for teaching, several pictures (four of *K*'s favorites) were fixed to the walls of *K*'s bedroom, each with a word printed beneath. The words for these pictures were *baby, car, boy,* and *girl.* The *E*s would look at and talk about the pictures with *K* several times a day in order to stimulate his interest in them.

The *E*s trained *K* to point either to the picture or to the written word whenever the word was spoken. (The procedure was similar to that used in the previous phase.) Once this sort of response was established, the picture was removed (permanently) and only the printed word was retained on a card. *K* learned to point to this printed word when he heard the word spoken. In this way, the word *boy* was focused on and became the first word that he learned. After this word was learned, the other items on the wall—*car, baby,* and *girl*—were reduced to their printed forms only and similarly learned. From this time on, any new item was presented only in a printed form. No pictures or objects were presented with the printed form nor was there any necessity to do so. The *E*s simply saying the word and pointing to its printed form was sufficient. Once *K* had acquired the critical idea that a printed form represents a word, association with the original objects evidently was no longer necessary.

In order to orient *K* properly for interpreting English orthography, the *E*s would run their index finger across the printed word from left to right when reading. *K* was encouraged to imitate this pointing. Soon *K* would move his eyes in a left to right direction whenever he looked at words.

The *E*s printed each word, phrase, or sentence on a card. The cards were made of cardboard and the letters were of the same size and character as in the previous phases. A card was 3 inches wide and 7 or more inches long depending on the length of the words involved. So that the words would be similar to those found in books, capitalization was only used for proper names and the beginning of sentences.

New cards were made to commemorate any new experience of *K*'s. A pack of blank cards was always kept handy. *K* would make it known whenever he himself wanted a new card made. The basic

principle underlying the making of cards was simply that no card be made unless the words on it were ones that *K* would understand if they were spoken to him. In this way, the teaching of reading was not made more complex by the teaching of language.

Because words like *the* and *to* are not meaningful in isolation, such types of words (articles, prepositions, etc.) were never placed alone on a card. However, these sorts of words were included on cards having phrases and sentences when it appeared that *K* understood the meaning of the phrase or sentence as a whole. Phrases and sentences, it should be noted, were always spoken with natural speed and intonation. They were never spoken in a stilted word-by-word fashion. This was done so as to encourage *K* to focus on the meaning of the larger reading unit.

Once cards were made for items, the cards themselves were used for teaching and testing. *K* would be asked to pick out a particular card; e.g., "Where does it say helicopter?" and would be rewarded if he picked the right card. He was encouraged to make a different choice if he picked the wrong card.

When *K* began to speak and was able to say the words on the cards, he was not discouraged from doing so. Sometimes, the *E*s would hold up cards and ask *K* to verbally identify them. *K* enjoyed any such variation.

A reading session with the cards would last anywhere from 2 to 15 minutes depending on *K*'s interest. In general, less than 15 minutes per day were spent in reading sessions during this phase.

Phase 4: Text Reading. The purpose of this final phase was to teach *K* to read the text of books. Instead of simply reading single isolated sentences, *K* had to learn to read sequences of two or more sentences which are related in some meaningful way.

For purely practical reasons the *E*s waited until *K* gained fluency in speech and was able to read aloud before beginning this phase. Reading aloud provides a simple means of monitoring reading progress, especially with respect to determining particular areas of difficulty.

K was 33 months when this phase was seriously initiated. The *E*s made cards for many of the words, phrases, or sentences which appeared in *K*'s favorite books. By making such cards, the *E*s wished to familiarize *K* with some of the items in a book before

attempting to teach him to read it in text form. As *K* began to read books, however, card making became unnecessary since the books themselves contained a permanent record of the items to be read. Nonetheless, practice and testing with the large stack of cards which were already made was continued for some time afterwards because *K* enjoyed working with them.

The books selected for use were always within *K*'s level of comprehension, vocabulary, and structure range. Most importantly, the subject matter of the books had to be inherently interesting to *K*. Without such an interest, the *E*s feared that reading would become a burdensome chore and engender an aversion to learning to read.

The relationship of pictures to text varied greatly in the books which were given to *K*, the amount of text increasing with age. *K*'s earliest books at about 6 months consisted of pictures only and no text. Most of these were made of cloth because paper was too easy to destroy. At 12 months *K* was given books with pictures on every page and with a single word, phrase, or sentence under each picture. A number were novelty books of different shapes from a series called *A Golden Shape Book* published by Golden Books. By 20 months *K* was given books which had a picture on each page along with a sentence or two. There was no plot or story connecting the various pictures. Books of this type were *Everything Happens to Aaron, Hop on Pop,* and *Silly Billy's Alphabet.* At about 26 months *K* was given books which had a picture on almost every page but had 2 to 10 sentences of text per page. Furthermore, the text of each page was connected to form a story. Most of these books are from the Random House Beginner Book Series. Because pictures may serve to motivate reading by providing esthetic satisfaction and by stirring the imagination, *K*'s books always contained an abundance of pictures.

In general, to introduce a new book, the *E*s would first read the entire text aloud to *K*, commenting on the story and asking questions about it in order to increase his interest in it. They usually pointed as they read. Then they would go back through the book reading one line or sentence at a time, allowing *K* to repeat what they had just read. *K* would then be asked to read some of these sentences without prior prompting being given. He was praised

when an item was read correctly. When an item was read incorrectly, the *E*s would encourage him to try again. If he still did not produce the correct item, they would provide the answer and ask K to repeat the corrected item. *K* was also praised for a correct repetition. He soon developed the habit of repeating corrected items without being asked to do so. *K* would go through a book with the *E*s in this way, until he was ready to read it by himself. When this time came, the *E*s would provide help on difficult words and phrases. To make sure *K* could read independently and was not just reciting from memory, occasionally the *E*s would point to lines in the text at random and ask what was written.

When, by the age of four, *K* was often able to read new books on his own without prior help, the *E*'s role changed from that of active teaching to one of passive supporting. Since in the *E*s' estimation it was mainly practice that *K* now needed, less assistance and more encouragement were provided.

Tests and Evaluations. *K*'s reading performance was formally assessed on three occasions, when he was 3 years 6 months, 4 years 11 months, and 7 years 11 months.

On the first occasion the *E*s made a tape recording of *K* reading a book he had not seen before. The book, *Snow* by McKie and Eastman, is a Random House Beginner Book, 60 pages long (495 words running), and with a vocabulary of 139 different words. The text dealt with some subject matter which was unfamiliar to *K*, such as making snowballs and snowmen, skiing, and sleigh riding. The reading procedure employed during the taping was not typical, since *K* had never before been asked to read an entire new book by himself. As *K* read, the *E*s corrected him when he was wrong, rewarded him often with praise, and encouraged him to read to the end. The supervisor of the Reading Center at the University of Illinois, Colin Dunkeld, analyzed the tape.

On the second occasion, *K*'s reading ability was again evaluated by Dunkeld at the University of Illinois Reading Center. Standardized reading tests, however, were administered (by Dunkeld) this time. The tests were: (1) *Informal Reading Inventory:* Form B, University of Illinois; (2) the *Queen's College Graded Word List;* (3) *Gates-MacGinitie Reading Tests:* Primary A, Form 1 Compre-

hension and Primary B, Form 1 Vocabulary and Comprehension; and (4) *Wide Range Achievement Test:* Reading Level 1.

K's reading ability was evaluated for the third time at the Reading Center, University of Hawaii, again by means of standardized reading tests. The tests administered were: (1) the *Gates-McKillop Reading Diagnostic Tests:* Form 1; (2) *Gray ORAL Reading Test,* Form A; (3) *Dolch Basic Sight Vocabulary Test* (220 words); and (4) *Gates-MacGinitie Reading Tests:* Survey D, Form 1, and Survey E, Form 1.

Results

Letters. During the first phase, *K* became very familiar with the letters taped to his crib. The letters came to attract and interest him so that he often played with them as toys. He would frequently look at them, reach out for them, touch them, and when his feet were close enough, kick them. The letter naming routine also captured *K*'s interest. During a diaper change, a letter naming session had the effect of keeping him still.

By the age of 16 months *K* could identify most of the lower-case letters. Unfortunately, because he was not tested on letters until several months later, at what age he mastered the entire alphabet is not known. However, at the age of 21 months when he was tested, *K* was able to correctly identify all of the upper- and lower-case letters by pointing to each as it was named. (The third phase was already well underway by this time.)

Words, Phrases & Sentences. At 12 months *K* could identify the cards for the words *boy, car, baby,* and *girl* by selecting a particular card from the set of four when asked to do so. He could not say any of these words. By 24 months *K* could identify 48 words, phrases, and sentences. Of these, he was able to pronounce (or approximate in a way the *E*s could understand) only 15. When *K* began to develop speech rapidly, after his 24th month, there was a great increase in the number of new cards. For example, 52 were made during his 26th month. By his 30th month, *K* could read 181 different items. Table I lists these items.

The ages listed in Table I indicate *K*'s age at the time the card was made. It is not necessarily the age when *K* learned the item,

TABLE I. *K*'s Reading Items

Age when card made (in months) with item.

10 boy	15 Miho[1]	24 hot	26 meat
10 girl	15 orange	25 bicycle	26 more
11 baby	15 apple	25 Mama's key	26 papaya[3]
11 car	16 airplane	25 moon	26 no more
12 key	16 book	25 pear	26 shee shee[4]
12 Daddy	16 drive	25 truck	26 water
12 down	17 bag	25 nine	26 yes
12 blow	17 come on	25 bus	26 bacon
12 cake	18 corn	25 blanket	26 meadow gold[5]
13 bed	18 fork	25 stop	26 sleep
13 birdie	18 What's that?	25 helicopter	26 spoon
13 bottle	19 table	25 Auntie	26 thank you
13 bye	20 I didn't	25 ice cream	26 TV
13 cookie	20 walk	25 cup	26 bike
13 Kimi	20 I see	25 teeth	26 boat
13 no	21 mine	25 coffee	26 clock
13 shoes	21 money	25 choo-choo train	26 sunny
14 banana	22 Grandpa		26 seal
14 ball	22 muumuu[2]	25 9 o'clock	26 salt
14 go	23 cold	25 Shut the door	26 toast
14 grass	23 Jim	25 Daddy's key	26 eye
14 hooray	23 Peter	26 dog	26 hop
14 mama	23 Peter's room	26 drive the car	26 Indian
14 milk	24 diaper	26 door	26 Mickey
15 tea	24 card	26 juice	26 towel

Note: Each month indicates a range in age from .0 to .9. Thus an entry of 10 months, for example, indicates an age range of from 10.0 months to 10.9 months.

1. The name of *K*'s mother.
2. A Hawaiian dress.
3. A Hawaiian fruit.
4. Urine (Japanese).
5. Name of brand of milk.
6. Name of a little girl.
7. Name of a clown doll.
8. Name of a little boy.
9. Name of a shopping center.

26 okay
26 please
26 buckle my shoe
26 record
26 Open the door
26 Tony
26 balloon
26 candy
26 Danny
26 elevator
26 watch
26 What's this?
26 egg
26 fire
26 hat
26 horse
26 monkey
26 Mila[6]
26 mail
26 mouth
26 apple juice
26 Don
26 cook
26 sick
26 Mr. Clown[7]
27 other room
27 school bus
27 stocking
27 chair
27 red light
27 green light
27 jump
27 Kimi's room
27 rice
27 rain
27 harmonica
27 pants
27 Shin-chan[8]
27 write
27 guava juice
27 not now
28 Waikiki Beach
28 Steinberg
28 shirt
28 Kathy
28 change
28 How about that?
28 dirty
28 tissue
28 Ala Moana[9]
28 up and down
28 two
28 Dean
28 newspaper
29 bat
29 haircut
29 Japan
29 Owen
29 pail
29 pen
29 Ryan
29 hit the ball
29 lie down
29 Uncle Ernie
29 Aunt Alice
29 sit down
29 push the button
30 fish
30 bubble
30 baseball
30 bathroom
30 feed the animals
30 grapes
30 one by one
30 sandbox
30 yellow bus
30 puzzle
30 Batman
30 What is new?
30 Uncle Arthur
30 merry-go-round
30 sing a song

since the amount of time and the number of presentations required to learn individual items varied. However, since all items were learned within a month of the first presentation, the age of card-making plus one month would cover the age by which the item had been learned. Such an estimate is a conservative one since *K* learned many items after a single presentation.

Of the 181 items *K* had learned by his 31st month, 136 are single words, 28 are phrases, and 17 are sentences. Words range in length from 2 letters *(no)* to 10 *(helicopter)*. *K* did not appear to have any more difficulty learning longer words than he had learning shorter ones. *Airplane* (8 letters) and *Grandpa* (7 letters), for example, are among the earliest words he learned and these were learned after only one trial. A few of the early phrases and sentences *K* learned to identify may or may not have been regarded by him as actual phrases or sentences in the beginning. *What's*

this? or *ice cream*, for example, may well have been viewed as a single word. Of the single words *K* learned, most (109) are nouns. The others are mainly verbs (11) and adjectives (8). The majority of phrases are adjective/noun combinations (10); e.g., *red light, other room*. Of the 17 sentences, 11 are imperatives; e.g., *hit the ball, lie down*, 4 are questions and 2 are statements. All items were ones whose meaning *K* demonstrated that he understood.

K learned to read a number of words before he had completely mastered all of the letters of the alphabet. Among these were the words *boy* and *key*. Although *boy* was learned separately a couple of months earlier, *K* frequently mistook one word for the other. However, once he had learned all of the letters of the alphabet, he no longer confused the two.

Sound Correspondences. Despite the fact that *K* had not been taught the sound correspondence of letters by the *E*s, during his 27th month it became apparent that he knew the sound value of some letters. On one occasion, just after his mother had printed up several new cards and had not yet identified them for *K*, *K* picked up the one on which *clock* was written, and said, "k-k-k—What's this, Mommy?" Since *K* already had 10 words on cards that began with the letter *c*, (all but one having a [k] pronunciation) it appears that he induced the proper sound correspondence principle from such data. A similar situation occurred with the letter *t*. He said "t-t-t" for the newly written word *toast* before it was pronounced or identified for him. By the time *K* was 4 years old, he had become adept at reading new words aloud in a style which was smooth and fluent. *K* generally did not use a sound out letter-by-letter approach to the pronunciation of novel items. (See the results of the first evaluation session below for more data with regard to this question.)

Text. By his 27th month *K* could read a few simple books aloud. Among these were those in the Beginner Book series: Dr. Seuss's *Hop on Pop; One Fish, Two Fish, Red Fish, Blue Fish;* and *Green Eggs and Ham*. By the time *K* was 3 years 7 months old, he could, at first sight, read correctly about two-thirds or three-quarters of a book of this type.

Although *K*'s card learning had mainly involved silent reading,

his book learning involved reading aloud. As a result, he could not read books silently. In order to get him out of the habit of reading aloud, the *E*s encouraged him to read short passages silently, issuing reminders to read silently when *K* would read aloud. After a couple of months, by the age of 4 years 4 months, *K* was able to read silently.

Evaluation 1: Age 3 years 6 months. Excerpts from the transcript of *K*'s taped responses to each line of the text of the book *Snow* is shown in Table II. Although *K* went through the entire 135 lines of the book, due to space limitations only a sample of his responses is presented.

Analysis shows that *K* was able to read about 50 of the 135 lines of text perfectly at first sight; e.g., *Come out in the snow*, *What is snow? We do not know*, *We can't go fast*, and *Just look at the snow*. The sentences and phrases are pronounced fluently and with appropriate intonation. Unnatural pauses do not occur. His verbal expression indicates that he understands the sentences.

For those sentences he had to labor through word by word, he would often say the entire sentence over again when he completed the process. *K*'s natural manner and intonation in such recapitulations indicate that he understands what he is reading.

The mistakes *K* made are quite revealing. Most of his mistakes are substitutions of unknown words. There seem to be two kinds of substitutions: one of meaning (e.g., *Come up* for *Get up*; *The hill is deep* for *The hill is steep*) and one of orthography (e.g., *a big apple* for *a big appetite*; *He has to have a bread* for *He has to have a head*). When *K* came across a word he did not know, he usually tried to guess what the word was. Sometimes he simply asked what it said. When he tried to read words he did not know, he generally attempted to read them as wholes, and gave little evidence of analyzing parts of words. For example, he attempted *sid* for *slide* and *louts* for *let's*.

Evaluation 2: Age 4 years 11 months. These results are perhaps best presented in the words of the original report:

> *The Informal Reading Inventory* is a series of reading passages taken from basal readers at each reading level. The child reads aloud and answers prepared questions. Kimio's performance:

TABLE II. Excerpt from Transcript of *K* Reading Text

Lines of the text of the book, *Snow*, are numbered and shown in regular type. *K*'s responses (in italics) are presented only when he has made some sort of error. Thus, if no response of *K*'s is shown following a line of text, this indicates that the line was read perfectly by him at the first try. The responses of *D* (Daddy) also appear (in italics).

1 Snow!
2 Snow! Snow!
3 Come out in the snow.
4 Snow! Snow!
5 Just look at the snow!
6 Come out! Come out!
7 Come out in the snow.
8 I want to know
9 If you like snow.
K: If you like the—like snow.
10 Do you like it?
11 Yes or no?
12 Oh yes! Oh yes!
K: Oh yes! Oh—yes
D: Um-Hum.
K: Oh yes! Oh yes!
13 I do like snow.
K: I do—I do—like snow.
D: Perfect! So far, perfect!
14 Do you like it
15 In your face?
26 Snow is good.
27 For me and you,
28 For men and women
K: For men—what is—and—what does that say?
D: For men and women
K: Women.
29 Horses, too.
30 Snow is good.
31 It makes you slide.
K: We make
D: It
K: to make
D: It
K: It make your sid.
D: It makes you slide.
K: slide.
34 Snow is good
35 For making tracks . . .
K: For make ticks
D: For making tracks.
K: t-r-acks.
D: See, these things here are tracks. You push the snow in—
K: What's tracks?
D: Tracks are these things here that you push in.
K: Push, push, push?
D: Yeah.
K: Why?
D: Well, you do that with the snow. You'll see.
39 The snow is deep.
K: The snow is drop
D: The snow is deep.
K: deep.
D: That means it's very thick—very deep.
40 We can't go fast.
41 The hill is steep.
K: The hill is deep.
D: The hill is steep.
K: steep
66 A lot of snow balls
K: A lot of—of snow balls.

67 Make a wall.
68 Put on more snowballs
69 One by one.
70 Our house of snow
71 Will soon be done.
K: Will stand
D: Will soon
K: be down
D: done.
K: done.
72 Do you like bread?
K: Do you like bread. Bread?
D: Bread—that's right.
73 Do you like meat?
K: Do you like must?
D: No, meat.
K: Meat.
74 Come in our house.
75 Come in and eat.
76 Snow is lots of fun,
K: Snow is—What does that say?
D: is lots
K: of fun.
78 It gives you
K: It goes
D: No, first of all, that word is . . .
K: It—What does that say?
D: gives
K: gives you
79 A big appetite
K: A big apple
D: No, appetite.
K: appetite.
80 We had our bread.
81 We had our meat.
82 Some bread is left
K: Snow bread
D: No.
K: Some bread
D: Right.
K: is . . . is—What does that say?
D: is left.
K: left.
98 But first
K: But fish . . . first
99 He [the snowman] has to have a head.
K: He has to have a bread
D: A what?
K: a bread.
D: a head.
K: a head
120 The way that sun
K: The way the—the way that sun
121 Is coming down,
K: is . . . is come
D: is . . .
K: is ca-ing
D: You know, you almost had it.
K: going, coming.
D: coming. Right
K: down.
126 Take all you can
127 And run! Run! Run!
128 The snow out there
129 Will come and go,
130 But snow will keep
131 In here, we know.
132 So we will put
K: So we will pail.
D: No, put.
K: put
133 This snow away.

	Grade 2	*Grade 3*	*Grade 4*	*Grade 5*
WORD RECOGNITION	91%	96%	94%	84%
COMPREHENSION	84%	33%	41%	12%

The majority of Kimio's errors were omissions and substitutions. Most of the words he omitted carried little information. Once again he proceeded rapidly. When he encounters an unfamiliar word he usually makes a quick attack which preserves some features of the word. He gives evidence of recognizing word parts of syllable length in unknown words. He gave no indication of using any letter sounding technique on this test. His errors suggest that he is paying attention to meaning and making use of clues provided by the context. For example, he read *let me* in place of *let's*, *it* in place of *a piece*, and *outloud* in place of *aloud*. On multi-syllabic words he manufactured novel forms by making syllable substitutions in the middle of words. For example, he read *rescovered* for *received* and *inspentions* for *inspectors*.

The rapid drop in comprehension after the second-grade level is more probably a function of the subject matter of the reading passages than an indication of Kimio's general approach to reading. He is able to pronounce many words that he does not yet know.

Queen's College Graded Word List. Kimio read all of the words at pre-primer, primer, first- and second-grade levels without error. At the third- and fourth-grade level he missed seven of the ten words. He pronounced one or more syllables correctly on all of the words he missed at levels four and five. He read quickly and with little hesitation. Quite often in the multi-syllabic words he substituted one English syllable for another in the middle of the word thereby manufacturing novel forms of his own.

Gates-MacGinitie Form B.
Vocabulary: Grade level 3.6 Comprehension: Grade level 2.5

Gates-MacGinitie Form A.
Comprehension: Grade level 3.6

Wide-Range Achievement Test. A graded test of word pronunciation. Score: Grade level 4.1

Evaluation 3: Age 7 years 11 months. The following is quoted directly from the University of Hawaii Reading Center report:

Gates-McKillop Reading Diagnostic Tests, Form 1 (Grade Scores reported).

Oral Reading: 6.0 Words Flash Presentation: 6.6

Words Untimed: 6.2 Phrases Flash Presentation: 5.4 (Perfect Score)

Knowledge of Word Parts: 6.9 (Perfect) Auditory Blending: 4.9 (Perfect)

Recognizing Visual Form of Sound: 5.9 (Perfect)

Spelling: 4.4 Oral Vocabulary: 6.8 Syllabication: 5.6

On the oral reading test *K* read fluently in paragraphs 1-5, and his expression and phrasing were excellent.

Gray ORAL Reading Test, Form A. Grade Score: 6.5

Analysis. *K* read enthusiastically with excellent expression and phrasing. Most of the mispronunciations resulted from a difficulty with the middle syllable in a multisyllabic word.

Dolch Basic Sight Vocabulary Test (220 words).

Read *220* words Missed *0* words

Gates MacGinitie Reading Tests, Survey D Form 1.

	Speed & Accuracy		*Vocabulary*	*Comprehension*
	No. Attempted	*No. Correct*		
PERCENTILE	99	99	86	96
GRADE	11.8	12.0	6.0	8.1

Gates MacGinitie Reading Tests, Survey E, Form 1.

	Speed & Accuracy		*Vocabulary*	*Comprehension*
	No. Attempted	*No. Correct*		
PERCENTILE	93	93	31	38
GRADE	12.3	9.8	5.9	6.3

In summary, this final evaluation shows that on most tests of oral and silent reading, *K*'s reading performance at the age of 7:11 was at least equivalent to the average performance of children in the middle of their sixth grade year; i.e., age 11:6. *K* ranks in the 99th percentile among students in grade 4, and the 93rd percentile among students in grade 7. His performance on tests of reading speed and accuracy is at least the equivalent of the average performance of students in the middle of their eleventh grade year. *K* was in the third grade at the time the tests were administered.

Discussion

Success of the Reading Program. By 3½ years of age *K* was able to read short sentences fluently and with natural intonation; new words could often be read at first sight. By 5 years he was reading at grade 3 level and beyond. Since *K* had not been taught reading at school, such findings may be plausibly attributed to the effects of the program.

On the other hand, the later findings—that by 8 years and as a third grader, *K*'s reading achievement equalled or bettered: (1) sixth graders on vocabulary and comprehension, and (2) eleventh graders on speed and accuracy—have, of course, been influenced by schooling. However, since there was nothing special about the reading instruction which *K* received at school, we are inclined to attribute his high level of achievement, in large part, to the influence of the early reading program.

K's eleventh-grade level in speed and accuracy, in particular, lends credence to that interpretation. We feel that the emphasis of the program on the understanding of written material, as opposed to the pronunciation of that material, resulted in *K* becoming what might be called a *visual* type of reader. Such a reader typically directly associates orthographic configurations with meaning without the mediation of any other process—such as speech production—either overt or cognitive.

Speech Production and Teaching Methodology. Unfortunately, most reading programs—from the "linguistic" (Structuralist; e.g., Bloomfield, 1961) to the "phonic" (e.g., Heilman, 1968)—involve a methodology which assigns a primary role to speech production in the teaching of reading. Essentially, the Bloomfieldian approach focuses on the pronunciation of words, while the various phonics approaches focus on the pronunciation of individual sound segments or syllables. The assumption underlying such methodologies—that speech production is necessary for the learning of reading—however, is ill-founded. This study shows that the teaching of reading does not require prior speaking ability on the part of the learner.

This study further shows that the sound correspondence of letters can be learned through simple induction without the need of special training or materials. Correspondences were learned by

K incidentally during the course of learning to identify whole words. Such a feat on the part of a child should not be surprising when one considers that such learning is not nearly so complex as what the child learns at the same age in terms of the sound patterning of his language. The sound pattern of the language is acquired virtually entirely through induction, on the basis of spoken whole words. Parents do not, for example, talk in individual sound segments or syllables to their infants before they say whole words, nor do they usually attempt to verbalize phonological rules for them. Yet, children do learn the phonology of their language. Such being the case, we might then expect that children would acquire the sound correspondences of letters, too, in the course of learning to read whole words.

Early Reading and Programs. The present investigation demonstrates that the teaching of reading may begin as early as 6 months of age and that during the pre-speech period significant reading skills may be acquired. By 1 year, for example, *K* could distinguish many letters and could identify four words although he could not say them. And, by 2 years he could identify 48 words and phrases even though he could articulate less than a third of that number.

On the basis of published literature of which we are aware, prior to this study, the youngest age at which a systematic reading program had been administered was 2 years. (Doman, 1964 & 1971; and Fowler, 1962). Both the Doman and Fowler programs use a whole word "look-say" type of approach.

The Fowler program was applied rather briefly (about 9 months) to a 2-year-old *S*. It involved rather limited objectives, focusing mainly on the reading of individual words. The *S* was reported to have "covered" 250 words during the course of the program.

The Doman program seems to have involved hundreds of *S*s and with varying degrees of success. Unfortunately, perhaps because individuals were not studied intensively, Doman presents only anecdotal evidence (parent's letters, etc.) in support of the effectiveness of his program. Without any sort of quantitative data concerning the progress and achievement of his *S*s, a comparison of the overall effectiveness of Doman's program and our own is not possible.

It might be worthwhile to point out a few of the more important ways in which Doman's program differs from our own:

1. Doman presents words before letters. Letters are taught only after a reading vocabulary of 60 words have been learned. It may well be that starting directly with whole words may be best. As noted above, the child will decompose wholes into parts anyway. On the other hand, a six-month-old child may respond better to less complex stimuli than do older children and thus may respond better to individual letters than to whole words. Fortunately, such an issue as this is one that lends itself to an empirical solution.

2. Doman prescribes a fixed set of vocabulary items to be learned, including such words as *of* and *the* (presumably because these two words are of high frequency). Even if most are common items, since environments and experiences vary considerably from child to child, it may well be that a number of these words may not be known by any particular child. Consequently, in such cases, the child would be required to learn the new word and read it at the same time. Such a double learning requirement presents an unnecessary obstacle to learning to read in our view. Learning language is not included in our program of learning to read since the child is asked to read only those words he already understands. And, too, because words like *of* and *the* are not particularly meaningful in isolation, we advocate their inclusion only in phrases and sentences.

General Applicability of the Reading Program. An objection may be raised to the generalizability of the findings of this study, to the effect that our reading program may have nothing special to recommend it because *K* might have learned to read as well as he did simply because he was a bright child. Although we can say that it is unlikely that even a bright child could have attained the degree of reading skill that *K* did and at the ages that *K* did without the benefit of the program, still, some reasonable doubt could, of course, remain. However, we do have other evidence which goes far to dispel any such doubt as to the effectiveness of the program.

Our reading program has been applied to *A*—a child with Down's Syndrome (Trisomy 21)—intermittently, over a period of about 34 months with significant success.[1] *A*'s parents began using

the reading program when he was 26 months. At 5 years 0 months of age, *A* can now read 53 different items, 5 of which are sentences and phrases; e.g., *cookie, ice cream, aeroplane, rabbit, duck, boy, girl, go, run, walk, sit, stop, Come Betty, Come Wayne, Go outside, See Susan,* and *Run Jimmy.* (See Kuntzman, forthcoming, for details of this case.)

These facts lend strong support to the notion that the program itself is an effective one. They further indicate that the program can be applied with some degree of success to retarded children. Given its feature of de-emphasizing the role of speech production on the part of the learner, it would appear that the program may be used as is or adapted to a wide variety of special groups in a population; e.g., mutes, second language learners, etc.

Early Reading and Reading Readiness. K's reading achievements provide evidence (as does Doman's and Fowler's work to some degree) that contradicts most theories concerning when children are ready to begin learning to read. Because current theories and tests are really designed to measure what might be called "classroom readiness," it is not surprising that most children are not found to qualify before 5 years of age.

Consider the reading readiness prerequisites which are demanded by the Gates & MacGinitie (1968) *Readiness Skills* test, a test in wide use for kindergartners and first graders. The authors' description of each of its seven subtests follows, along with some of our comments:

> [1] The Listening Comprehension subtest measures the child's ability to understand the total thought of a simple story. The subtest includes 20 stories (plus a sample story), each with a corresponding panel of three pictures in the test booklet. The examiner reads these stories aloud to the children. Each story is followed by a question, and the child is to mark the one picture in each panel that best answers the question. (p. 1)

Understanding and remembering the essentials of a story is required in subtest 1. Yet, *K* had acquired significant reading skills long before his being able to meet such a requirement.

> [2] The Auditory Discrimination subtest measures the child's skill in distinguishing between two words of similar sound. It includes 21 pairs of pictures (plus one sample pair) that cor-

> respond to 21 pairs of words. Each pair differs in only one sound. After naming both pictures in a pair, the examiner pronounces the name of one of the pictures again. The child marks the corresponding picture. (p. 1)

Many of the discriminations present in subtest 2 are not present in many varieties of English; e.g., *with-wit*. Since all items are presented in isolation without context, even standard English speakers might miss distinctions like *sub-sup* or *chip:ship*. In any case, ability to hear all distinctions is not necessary for reading so long as orthographic form and meaning are associated. After all, English spelling is not without irregularities, in which case, we as learners simply memorize the orthographic form. Certainly, *K* would not have been able to pass such a test until long after he had acquired significant reading skills.

> [3] The Visual Discrimination subtest measures the child's ability to distinguish between the printed forms of two words. It includes 24 items (and a sample), each consisting of four words—three alike and one different. The child is to mark the one word that is different. (p. 1)

Such a subtest as 3 is not relevant to readiness but rather is part of the reading process itself. *K*'s normal vision at 6 months was all that was necessary in terms of visual discrimination ability.

> [4] The Following Directions subtest measures the child's skill in following increasingly more complex directions. This subtest has 14 items (and a sample), consisting of one or more directions which the examiner reads aloud. Corresponding to each set of directions is a panel of four pictures to be marked by the child as he carries out the directions. (p. 1)

Consider a typical direction like, "Move your finger up to the next box, and put an X on the little dog that is followed by a big dog and another X on the big dog that stands between two little ones." The authors instruct the examiner,

> Do *not* repeat the instructions for this or any of the following items in this subtest; read each direction clearly only *once*. Pause after each item, but *do not pause between parts of the directions within an item*. (p. 9. Emphasis in original.)

Even *after K* had been reading fluently, it is doubtful whether he

could have responded to such instructions as in subtest 4. Such a criterion as this is an absurdly strong one.

> [5] The Letter Recognition subtest is designed to measure the child's recognition of letters of the alphabet. It consists of 18 items (and a sample), with four letters of the alphabet in each item. The examiner names one letter which the child must recognize and mark. (p. 1)

Recognition of letters should not be used as a criterion of readiness, but should be incorporated into a program which teaches reading.

> [6] The Visual-Motor Coordination subtest measures the child's skill in completing printed letters. Seven letters (plus a sample) are shown as models, and a part of each letter is also printed in the adjoining column. The child is to complete each letter in the adjoining column, following the model. (p. 1)

The physiological basis for the motor control demanded in subtest 6 typically does not mature in children until 5 or 6 years. *K* had great difficulty in forming letters until he was 6 years. (*K* continues to be a poor writer.) Writing is a separate skill entirely from reading and should not be used as a criterion for reading readiness.

> [7] The Auditory Blending subtest provides information about the child's ability to join the parts of a word, presented orally, into a whole word. The 14 items (plus a sample) consist of three pictures each. The examiner pronounces the name of one of the pictures in each item, saying it in two or three parts, and the child marks the corresponding picture. (p. 2)

In subtest 7, the examiner is required to pronounce items similar to: *br-i-cks* (for *bricks*), *p-ai-nt* (for *paint*), and *n-ap* (for *nap*). The hyphen indicates where the examiner is to insert a one-second pause. The child is asked for example, "Put an X on *br-i-cks*." Because of the unnatural segmentation and the addition of other sounds (particularly vowels) in order to pronounce isolated consonants, even literate adults would find such items difficult to interpret. (See Bloomfield, 1961, for a criticism of "phonic" methodology.) Even at 5 years, when he could read fluently, it is doubtful that *K* could have passed such a test which distorts the natural language and expects testees to reconstruct the undistorted original item.

If the above test could be said to be atypical or unusual there might perhaps be little cause for alarm. Unfortunately such a test is all too typical of current readiness tests. See, for example, Hafner & Jolly's (1972) description of the widely used *Van Wagenen* and *Metropolitan* readiness tests. In addition to some of the prerequisites demanded by the test described above, these tests require general knowledge (e.g., What animal has humps on its back?), understanding of analogies and complex sentence structure (e.g., You wear a hat on your head and a glove on your_____?), memory span, accurate pronunciation, and knowledge of antonyms (e.g., When I say east, you say_____?).

Our research demonstrates that the prerequisites established for reading readiness by current readiness theorists are largely irrelevant. For example, *K*'s early reading achievements demonstrate that not even one of the seven subtests of the Gates-MacGinitie *Readiness Skills* test is relevant to readiness. *K* was ready to begin to learn to read when he was able to sit up, point, and understand some simple language. According to these criteria, normal children would be ready to begin to learn to read before their first or second birthday. Clearly, the prevailing notions of reading readiness are essentially mythological.

Advantages of Early Reading. Teaching a child to read early may provide a number of important benefits:

1. Reading increases the enjoyment in a child's life. Such enjoyment can be gained on his own.
2. As a source of knowledge, books enrich a child's life. They satisfy and stimulate a child's natural curiosity.
3. Parents' dependency on the school to teach reading is reduced. A child can learn the essentials at home and at his own pace.
4. Better readers are produced in terms of speed and accuracy.
5. The learning process can be enjoyable. In particular, rote-learning aspects (repetition and simple association) which are often found tedious and dull by the school-age child are much enjoyed by the younger child.
6. Relatively little time is required to administer the program—never more than 20 minutes per day.
7. A nationwide program of early reading has the potential of upgrading the overall educational level of children.

Insofar as disadvantages are concerned, we are aware of only one, but it is an important one. That is, despite admonitions and warnings, some parents may be insensitive or calloused in applying the program so that the child would suffer. Unfortunately, for the child such parents are likely to be a problem in other spheres of his life as well. Although such a distinct disadvantage cannot be denied, we nonetheless feel that the advantages to be gained are sufficiently significant to warrant the advocacy of a program for early reading.

As far as we could determine, there were no harmful effects of the program. Yet, there seems to be a variety of notions around about the "dangers" of early reading (see Durkin, 1968, for a survey of such ideas). For example, with regard to social adjustment, Bettelheim (1966) warns, "If the child can really read, he's no longer interested in your reading to him. So at an early age you've already cut off the enjoyment of interaction, and the benefits he derives from it. You've already made him an isolate" (p. 40). Such a view is not supported by our data. On the contrary, we found that *K* continued to ask to be read to years after he was reading text. Far from making *K* an "isolate," teaching reading and reading aloud to *K* brought parents and *K* even *closer* together.

At school, too, *K* has adjusted normally. Perhaps it is a matter of luck, but *K*'s teachers have always been understanding in dealing with his reading advantage. Nor has early stimulation adversely affected *K*'s visual acuity. His vision is normal and requires no correction. Recent research even indicates that early visual stimulation may be beneficial (Blakemore & Cooper, 1970; and Annis & Frost, 1973). There appears to be no evidence to support the contention that learning to read early is harmful.

The violinist, Shinichi Suzuki, reflects our own view on early childhood reading quite neatly. In defense of teaching young children to play the violin, he said, "When I have explained everything and they still ask me, all over again, 'Why do you start them so young?' I say, 'Why would you deprive a child of such great joy for so long?' "

1. That the retarded can be taught the rudiments of reading has been demonstrated by Fuller (1974) and Doman (1971).

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Acquisition of Writing Skills

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Acquisition of writing skills is viewed as a reduction of alternatives. Various levels and aspects of early writing are examined—including mirror-image reversals—in terms of a selection from an adjustable number of alternatives. It is argued that allowing information processing to proceed in adaptive stages will result in writing skills that are more accurate, complete, and individualized.

The principle of uncertainty reduction and information is pervasive (Bakan, 1974; Moxley, 1974b) and has been convincingly applied to reading (F. Smith, 1971). The following similarly examines the acquisition of writing skills by young children in terms of the child's selection from alternatives. In particular, a contrast is made between tasks which require the child to obtain the ultimate answer in one step from the full range of alternatives and tasks which permit the child several selections in sequential steps that reduce alternative considerations. The difference is between a strategy for "jumping to conclusions" and one for progressively reducing alternative considerations. In the following, "writing" is to be considered primarily as the production of visible language, however the process, and is not to be thought of as merely what a child can do when restricted to a pencil and a sheet of paper. The formation of words, for example, by typing or by placing "tiles" with letters on them (as in "Scrabble") is also a production of visible language which can be accomplished by very young children.

I. An Example from Handwriting

It has long been recognized that children four to five years of age commonly make some reversal errors in writing (Davidson, 1935; Wilson & Flemming, 1938). Comments by children are revealing

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of the nature of the task: "Which way shall I make it?" "Which way shall I turn it? I don't know—I'll turn it any way" (Hildreth, 1932). These comments indicate that the child is considering alternatives, this way or that way, this direction or that direction; and the child is having difficulty in making a selection from whatever alternatives he is considering.

> Observation of these children at work gave unmistakable evidence that the youngest children in the beginning stages of learning to make numbers and letters frequently have no clear notion of the direction in which the letter or number should be turned. In many cases, it appeared to be purely a matter of chance whether a letter was turned to the right or to the left, and hesitation and great indecision marked the performance until the final choice of direction was made. (Hildreth, 1932, p. 8)

Given this problem of "turning," the range of possible misdirection includes not only mirror reversals of the entire figure but also the reversal of any particular stroke, including reversals of parts of the figure when that figure is composed of more than one stroke. A "5" is composed of more strokes than a "1," has more "turnings," more decision points, and different parts of it may be turned in different directions. Other complicating decisions that would contribute to reversals and other errors include where to begin and where to connect, especially when the child must lift his writing instrument in order to make the next stroke. Considering the range of possible combinations of alternatives, it is not at all surprising that children might produce a variety of forms before "selecting" the "standardized" version.

A. Mirror-images

The prevalence of left-right mirror-image reversals in particular demonstrates the difficulty of selecting the standard version under certain conditions. The somewhat slow development of standardized directionality from left-right alternatives also has its historical precedent.

> Unlike handedness, which appears to be at least to some degree genetically determined, the direction of reading and writing seems to be merely a matter of convention. About AD 1500

there were as many scripts written and read from right to left as there were written and read from left to right. . . . Even today, however, Hebrew and Arabic are written from right to left. . . . Some early scripts, known as boustrophedon (literally an "ox-turning," or the plowing of alternate furrows in opposite directions), consisted of alternating left-to-right and right-to-left lines. In some instances the alternate lines were complete mirror images of each other, so that only the appropriate directional scan would provide each symbol with its correct orientation and meaning. (Corballis & Beale, 1971, pp. 102-103)

Given such arbitrariness in directionality, it is understandable that children would have difficulty in producing discriminative responses for the standardized direction. Reversal and rotational transformations that are seldom critical in identifying familiar objects in a three-dimensional world suddenly become critical when children are required to make graphic discriminations in a two-dimensional one (Sidman & Kirk, 1974).

The particular difficulty of mirror-image discriminations, in which the axis of alignment appears to be critical for the likelihood of mirror-image reversals, is also understandable.

In particular, it must be noted that any object has more than one mirror image, depending on the relation between the orientation of the figure and the axis of separation. If a figure is itself symmetrical about one of its axes, and the axis of separation is parallel to its axis of symmetry, then the mirror image is identical to the original figure. Otherwise the mirror image and the original figure differ from one another. The mirror image of ⊏ is commonly taken to be ⊐, and this is indeed true if the figure is rotated around its base or its open end. However, if it is rotated around either arm, its mirror image is ⊏.

As for the present findings, when the child correctly copies ⊏ underneath, or correctly copies ⊔ alongside, one might regard his copy either as a faithful reproduction of the original or as a mirror image, since these are indistinguishable. (Huttenlocher, 1967, p. 1175)

Thus, a child might adopt a reproduction strategy in which he copies by moving the line he's drawing near to the axis of separation (which lies between the model and the form he's making) where the model is near and by moving the line far from the axis

where the model is far (and produce a mirror image). Or he may adopt a reproduction strategy in which he copies by moving the line he's drawing near the axis of separation where the model is far, and far where the model is near (and produce an exact copy). Whichever way he does it, there may not always be a discernible difference in the end result. This ambiguity increases the difficulty of the child in determining whether the method of reproduction he selected can be relied upon in other instances.

Greater difficulty is especially experienced in left/right orientation (or in the horizontal direction) by adults (Sekuler & Houlihan, 1968; Wolff, 1971) and children (Huttenlocher, 1967). A plausible account can be found in the asymmetry of the horizontal field in our environment and the bilateral symmetry of our bodies (Corballis & Beale, 1971). This would also explain the difficulty children have in discriminating the directionality of oblique or diagonal lines (Rudel & Teuber, 1963) while readily discriminating vertical from horizontal lines ( vs. ). The presence of directional environmental cues in the vertical plane (an asymmetrical field) readily distinguishes it from the absence of directional cues in the horizontal plane (a symmetrical field). Gravity aligns us with the heavens above and the earth below; our feet are on the ground and our head is in the air. But what is on our left could easily be on our right; and what we see on the left side of our body is similarly seen on the right side. There are no easily identifiable, clear-cut aids to guide the child in his selection.

B. Complexity

While it is clear that training can produce improvement, it is also clear that some figures are more difficult for children to reproduce correctly than others. Children have little difficulty discriminating and producing "l" and "o" (Coleman, 1970; Lewis & Lewis, 1965) but have greater difficulty with more complex figures such as "N" and "5" (Lewis & Lewis, 1965; Moxley, 1970). In fact, even a simple directional turn may not be as difficult for children to reproduce correctly as it might first appear. For example, Moxley (1970) found that none of a class of 23 kindergarten children reversed "<", which occurred first in the forms to be

copied, althought a few children reversed " > ", which followed (perhaps an overgeneralization effect), and all but 2 children reversed one or more of the digits and symbols.

It has been suggested that orientation as a visual memory form is not that difficult (Bryant, 1973; Stein & Mandler, 1974), at least under certain circumstances. This suggests that multiple alternative considerations may seriously complicate the task for the child; e.g., multiple parts to orient, multiple methods of reproduction. In general, the consideration of more alternatives implies greater uncertainty and in that sense makes the final selection more difficult. Thus, it seems reasonable to expect that a child will more easily be able to be successful when there are fewer alternatives he needs to consider.

C. Aids for Implementation

It is possible to imagine a variety of ways in which aids might be provided for the child so as to make each stage in his progress easier, aids which would help him to reduce the alternatives for consideration. The child, for example, might be given a mnemonic algorithm for the internal structure of the figure, one stroke at a time (e.g., "neck, belly, hat" for "5" [Enstrom & Enstrom, 1969; S. Smith, 1973]); or he might be given feedback from latent images (Skinner & Krakower, 1968) or tracing (Dubnoff, Chambers, & Schaefer, 1969); or a vertical line for an external environmental cue (Smith & Smith). Not all "aids," however, may be helpful, whether writing instruments (Otto & Andersen, 1969) or cueing schemes (Moxley, 1970).

Explicit instructions on orientation (Caldwell & Hall, 1969), directional figure cues (Jeffrey, 1958), fading techniques (Bijou, 1968), and reinforcement (Tawney, 1972) have improved children's discrimination of orientation. Fading techniques (Moxley, 1970) and reinforcement (Brigham, Finfrock, Breunig, & Bushell, 1972; Hopkins, Schutte, & Garton, 1971; Sidman & Kirk, 1974) have also been used to increase the writing of figures in correct orientation.

D. Some Considerations for Application

Consider the following sequence of tasks in terms of the considerations they would provide and how they might reduce the complexity of the task for the child. The teacher models each task, then "walks" each child through it one step at a time, until the child can respond without prompting. The teacher also makes freely available the following guides: (1) oral mnemonic guides, (2) letter and numeral forms for "tracing" (or some other "instant feedback" device), and (3) letter and numeral forms for reference.

The teacher might begin with forms taped to the bottom of a flat pan that could be covered with a thin layer of salt, permitting the forms to show through. Children could then trace the forms with their finger and shake the pan to erase. Thicker layers of salt could be used until the child was ready to use a separate reference for the forms, removing the tape from the bottom of the tray but still leaving a model that the child could refer to. The child could then progress to using some writing instrument; e.g., from writing on a chalk board with a wet finger to writing with chalk (again, a similar choice of guides used previously could be made available). The child might then move to crayons or markers that could be easily erased while tracing or copying on an acetate cover. From there the child might move to paper and pencil or "magic marker." There facilitating aids might be models written on the paper, perhaps models that are gradually faded out, perhaps feedback from latent images, perhaps a marginal cueing line, perhaps folded paper.

The above serves to illustrate a variety of ways for reducing the complexity of the task for the child, ways which the child might skip or select at his own choosing. Some children may require a detailed combination of aids, some only a few to get them started. Different children bring different considerations of alternatives to the task. A verbal algorithm permits vivid imagery and internal structure to be recalled. Writing with a finger reduces the complexity of handling a writing instrument. Fading out an aid (e.g., with more and more salt or less and less cues) permits successive stages of greater independence from that aid. A feedback device permits self-checking and self-correction. A reference to an external reference point (e.g., "go toward the line") permits the left/right orientation to be anchored to a visible cue in the field.

II. Jumping-to-Conclusions or Reducing Alternatives

Simon and Simon (1973) have presented the advantages of an "indeterminate" algorithm of sound-letter lists over a "determinate" algorithm of a rule-table procedure in terms of both spelling accuracy and usefulness. They recommend a generate-and-test technique that encourages trying out alternatives rather than rules for directly arriving at the "correct" spelling.

The determinate algorithm method moves directly from identifying the occasion for its application to the "correct" answer. There is thus but one jump between initial uncertainty and the resolution of that uncertainty. The full range of alternative word forms is to be handled at one step by applying a list of rules. The problem, however, is that the "correct" answers dictated by the rules do not invariably match with reality. There are variations in the language unaccounted for and unpredicted by the rules. Multiplying the rules results in diminishing returns. Spellings still exist outside the rules, for the exactness and determination of the rule system is too restrictive for what actually indeed exists. For example, "i" before "e" except after "c" does not account for "seize."

In contrast, the indeterminate algorithm does not move in one jump from initial uncertainty to resolution but in successive stages which progressively reduce the variety of alternative considerations. The aids recommended are not ones immediately resulting in answers but ones which help reduce the alternative considerations. It is one step to generate a list of alternative written representations for representations in sound (perhaps with the help of a dictionary-type key). It is another step to write down some of those alternatives for comparison; e.g., "sieze," "seize," "seeze." And it is another step to make a final choice after visual inspection.

The contrast between these two concepts is a powerful one. On the one hand, the child is given a set of rules which do not consider some of the correct alternatives and which necessarily produce incorrect answers because of this. On the other hand, the child is given an aid for reducing alternative incorrect considerations, permitting the possible correct answers to remain among the alternatives.

Generally, overly restrictive and deterministic approaches that

try to simplify the movement from the full range of alternatives to the final answer in one step are often neither efficient nor effective. They often place children in artificially difficult situations, increasing rather than decreasing task difficulty, with error built into the answers. Such examples include requiring every child to begin handwriting with an exact replication of a particular model (e.g., touching particular lines at particular places, using a particular writing instrument, a particular posture, a particular sequencing of strokes, etc.); to begin expressive writing with thorough proof-read perfection using a particular dialect, style, and vocabulary; and to begin reading only in a manner suited to a particular oral reading model which requires vocalization of an unfamiliar text. As with spelling, these are examples of applying inflexible rules to produce correct results quickly in one step. As with spelling, these rules are notorious for producing "bad" results. Colleges are filled with students who lack flexibility in adapting reading to a purpose and who can read silently little faster than they can read aloud. Many of the "rules of grammar" that have been taught have strongly been repudiated by linguists. And it is commonplace to observe how badly the supposedly well-educated can write.

Where applicable, the jumping-to-conclusions model seems to have its best fit for low level factual recall skills and concrete rote learning. The more such algorithms are applied to higher level skills, to more abstract skills, and to more complex problem solving skills, the worse they seem to fit. In practice, much of traditional classroom "teaching" tasks are more "tests" that force children to "conclusions" for which they are not well prepared (Moxley, 1974c; D. Smith, 1974). Some of the relationships of indicators for concrete and abstract thinking have been examined in the classroom by Harvey (1970); Harvey, Prather, White, and Hoffmeister (1968); Harvey, White, Prather, Alter, and Hoffmeister (1966); and Soar & Soar (1972).

It should be pointed out, however, that what may be a complex problem at one level (e.g., drawing a letter for a three-year-old who has only been able to scribble) may be a simple concrete skill at another level (e.g., drawing a letter for an experienced layout artist). The response considerations may move from the active

consciousness to unconscious automaticity, from relatively "free" information to relatively "bound" information (Bakan, 1974). Those who have already acquired and assumed behaviors, taking for granted what they once struggled to learn, may also assume that a simple jump to a conclusion is all that the learner needs.

A reduction-of-alternatives approach does not attempt to resolve problems by putting all the considerations into foregone conclusions. Instead, this approach seeks to exhaust the full range of alternatives in a systematic fashion. A reduction-of-alternatives approach may begin with the full range of alternatives and seek to eliminate a large number of alternatives at each step. In the game of twenty questions, for example, questions can be asked to identify a specific animal, vegetable, or mineral which can only be answered by a "yes" or "no" response. Here, asking if something is bigger than a breadbox is more likely to eliminate substantial alternative considerations in the beginning than asking if something is a diamond ring. In this game, of course, the optimal strategy is to halve the alternative considerations at each step rather than to seek the final answer with every question. Jumping to conclusions is the wrong strategy for this game.

A reduction-of-alternatives approach, however, may also begin with only a few of the alternatives. The child makes a selection from those, and is then exposed to a few more alternatives. He makes a selection from those, and so on, until the child is exposed to the full range of alternatives. Fading out cues and prompts can serve this purpose. The child may be selecting the "final" answer at each step, but he is progressively expanding his ability to handle more and more alternative considerations. This may mean moving from the easy considerations to the more difficult ones after the child has mastered the earlier alternatives. The child, for example, may begin by writing "I," discriminating the vertical from the horizontal, and then write "L," adding a left-right discrimination from the earlier alternatives of vertical and horizontal. Or the child may move from the multiple visible differences between a simple "l" and "o" to the more subtle difference between the more complex figures of "b" and "d."

Any time inappropriate alternatives are eliminated from consideration or any time an equally likely alternative becomes more

likely or less likely than the other alternatives, then there has been an information gain, and the final answer is closer than before. For example, knowing that the answer is "b" or "d" is a gain in information from previously knowing that the answer was "b," "d," "p," or "q." In principle, the magnitude and rate of information gain can be adjusted to the capacity of each child so that it can be challenging without being either intimidating (too much) or boring (too little). Even though we may be unable to determine what the child's actual considerations are, we are able to increase or decrease the considerations involved in the task.

If the child is successful, we know we did not present too many alternatives. If the child shows motivated interest, by a high frequency rate of response or sustained attention, we have an indication we did not present too few alternatives. When the range of alternative considerations is manipulated and varied, information on response rate and specific improvement in performance provides empirical evidence as to which alternatives were most effectively adapted to a particular child.

The teacher may be the sole manager of alternatives presented to the child's consideration, deciding what alternatives to reduce, in what sequence, and what the final product will be. The child himself, however, may also be extensively involved in the management of alternative considerations. He may decide for himself which sequence of steps to move through. He may observe the results of his performances, monitor his own progress, and use empirical criteria of improvement for evaluating his own decision-making and self-selection.

Clearly, the decision-making needn't be a mutually exclusive, either/or involvement. Both teacher and child can participate to varying degrees in a reduction of alternatives approach. Although it may well be advantageous to have the child assume more and more decision-making responsibility, any additional consideration involved in additional decision-making adds to the total of considerations facing the child. And this too must be considered in a reduction of alternatives approach.

Because a reduction of alternatives model moves through progressive stages and seeks only the optimal amount of information for any particular child moving through any particular stage, the

total range of alternative considerations that are eventually processed may be indefinitely large. There is little need to permanently leave out any relevant alternative from consideration merely in order to simplify the task. Anything of relevance can be considered, which increases the likelihood that any useful alternative can be identified and can contribute to the solution. In contrast, since the jumping-to-conclusions model must process all the information at one hurdle, many relevant alternatives may be permanently excluded simply in order to simplify the task and make it more manageable. Reduction of alternatives simplifies by adjusting the alternatives to be considered at each stage. Jumping to conclusions simplifies by refusing to consider some alternatives, even if relevant, and by accepting "wrong" answers because they fit the rule. Reduction of alternatives does not need to ignore any problem or any consideration. Jumping to conclusions must ignore many problems and many considerations.

III. Levels of Writing

A reduction-of-alternatives approach could be applied to all levels of writing for all the components of a meaningful expression, from writing parts of letters and numerals to writing whole letters and numerals, from writing parts of words to writing whole words, from writing parts of complete expressions to writing complete expressions. Components of different levels can be learned separately or simultaneously. Analytic and holistic aspects may be combined. For instance, meaningful expression may be formed solely by a phrase, a word, a letter, or even a basic stroke of letter-numeral forms (i.e., "I"), given the appropriate context.

Variety is intrinsic to this approach: a variety of alternatives, a variety of guides, and a variety of activities. And all of this is subject to evaluation and comparison in terms of effectiveness and efficiency in generating a full and complete range of relevant considerations, reducing uncertainty, and producing a desirable outcome.

A. Writing Parts of Letters and Numerals

Even at the earliest levels, a reduction-of-alternatives approach would be consistent with the encouragement of problem solving,

creativity, and simply "playing" with visible language skills. Even scribbling can be colored and decorated, much like a stained glass mosaic, and it can serve as a kind of primordial "stream" of behavior from which increasingly specialized forms can arise.

> Rhythmic scribbling exercises could serve to uncover natural basic patterns.
>
> The most important element in this pattern is the angle, or the different angles, or movements; . . . we should not teach basic symbols of the alphabet in a specific traditional form, but only basic form-characteristics. . . . The idea is not to show a specific "a," but to show the *characteristics* of the symbol "a," etc. . . . This general approach to handwriting will be much freer and entail fewer frustrations. Its advantages will be greater sensitivity in recognizing patterns, and greater sensitivity towards the basic rules of form and shape. (Crouwel, 1974, p. 264)

Rather than insisting that strokes only be performed in one direction, for example, the child could be permitted alternative ways of writing "N," "M," "5," etc. For attempts to establish a consistent preference in movements may come at a cost. Consistent downstroking, for instance, requires a child to lift a writing instrument from the page when making an "N." Permitting a child to begin an "N" with an upstroke permits the child to keep his writing instrument on the paper and is a remedy for reducing the reversal of "N" (Enstrom & Enstrom, 1969). A similar problem exists with the numeral "5." Is progress of the child facilitated more by putting a priority on strokes which do not have to be made by lifting pencil from paper or is the priority to be placed on stroking in one direction only? Or should a choice be permitted?

Different ways of combining frontward and backward "c" with a line can form "b," "d," "p," "q," and other symbols, depending on the particular letterform model (Enstrom & Enstrom, 1969). Children can thus build the appropriate form from a limited set of component forms which have multiple correspondencies to different letters and numerals. This "set of diversity" in which a component form can be used for many symbols (Barganz, 1974) stands in contrast to advocacy of an invariant one-to-one correspondence approach.

Additional buildings of all letter and numeral forms can come from selections and combinations of straight and curved strokes in vertical, horizontal, and diagonal orientation, in which the turnings and connections are decisive. A picture of a house, roof, and sun can provide the basic strokes, as can a drawing of a ball, bird, and stick (Fuller, 1974). Even a picture of round clouds and slanting rain can provide basic strokes (Wright & Allen, 1975). Thus, children could learn to form letters and numerals in a stage by stage selection from a limited set of alternatives rather than being left to follow a particular algorithm for each separate letter and numeral. For a particular algorithm may be rather complex and may still leave aspects like reversals unaccounted for, especially when an explicit environmental cueing reference is not available.

It is also easy to imagine sensible alternatives to invariant rules for writing instruments (Anderson, 1966; Wiles, 1943) or grip (Otto & Anderson, 1969), as well as posture, slanting of strokes, and touching ruled lines on paper at particular points or avoiding them at particular distances. For with a monolithic approach that insists on only one way for all children to move to the "correct" answer in one jump, the child is lost if the correct answer does not result. He has no other means to find his way. A reduction-of-alternatives approach permits the child to select from among alternatives in successive stages to the correct answer. If the result is not satisfactory, the child has other alternatives to choose from.

B. Writing Parts of Words

Similarly, children can learn to spell in parts and thereby learn the beginning, middle, and end forms for words and their sounds. For example, if "_op" were already written for children as a guide, the child could then be asked to fill in "m" or "t" depending upon whether he heard the word "mop" or "top." Successive stages might move from "_op" to "to_" to "t_p" to "t__" to "___." By arranging the guides so that they would permit limited ranges of alternatives in progressive stages of difficulty (i.e., in general, expanding the range of allowable alternatives), clearly defined alternative choices could be made available for the child at whatever level desirable.

Among these guides could be keys to sound and letter correspondence, much as the key at the bottom of a dictionary page. Following Simon & Simon (1973), children could be permitted to generate lists of feasible alternatives, exercise a decision procedure in their selection (from visible inputs of the morphology or "form" of the words), and check the result (e.g., against a glossary or dictionary).

There are several advantages to an approach like this over the memorization of word lists for "spelling." (1) It would be a practical skill useful for looking up words in a dictionary. It would even be easy to make up a pronunciation key just like dictionaries do, using key known words as examples with marks over the vowels; e.g., "ā" as in "bāke." (2) It provides some information about print to sound as well as exact information about sound to print. Known words and sentences can be pronounced so that it can always be meaningful, at least more so than trying to analyze unfamiliar words from print to sound. (3) It is less complex and less of an information load than a whole word would be. It can be used for a minimally meaningful discrimination (e.g., "bit/bet") where the choices for the child to consider can be so few that if he does make a mistake he knows what the right way must be (e.g., telling the child to point to "i" or "e" when you say "bet"). It may thus be self-correcting in a way that handling all the sounds all at once in a whole word could never be (when there are too many other possible wrong ways for the child to select a "correct" way). This also makes it easier to reinforce and shape the child for small steps of progress. (4) It lends itself to games and peer tutoring cooperative relationships (e.g., bingo games where key letters for vowels could be printed on bingo cards, a word called, a letter covered; nonsense word games; flash card games; and situations where it would be easy for one child to share his little "bit" of knowledge by teaching or testing another child). (5) It lends itself to precise measurement of progress and research since exact records of the child's performance can be kept, and these records can reveal exactly where the child's difficulty is and what he has learned. (6) When a child writes in his own letters, even if only inserting a simple "i," he is expressing himself in print. Self-expression in visible language is open to considerable feed-

back. The expression is visible. It endures. It can receive feedback over time quite easily.

C. Writing Words and Parts of Phrases, Sentences, Paragraphs, Stories
At this level, the child could write words to form meaningful expressions, beginning at the one word level and expanding with the aid of guides that control the range of alternatives. At the one word level, for example, the child could make lists of things that make him happy, sad, or mad. Or he could make a book of wishes, or words he knows, or would like to know, or any collection he desires, in a kind of paradigmatic listing. Or the child could be given prompting guides that would narrow the alternatives that could be considered to completing an idea, in a kind of syntagmatic fashion: e.g., "My favorite food is . . .; The scariest thing that ever happened to me was . . . ; If I were the teacher, I would . . . ; If I were president of the U.S., I would . . . ." (Variable numbers of word forms or word cards may also be used in the substitution and sequencing of expressions.)

D. Writing Complete Expressions
Children can write their own stories, newspapers (which permit an indefinite variety and frequency of written expression), reports, books, novels, etc. Children, for example, can write a story, make a table of contents, title, author, vocabulary list, thought questions, and illustrations, with a check out card at the back to become part of the classroom's resources. Or the writings and illustrations of every child on a particular theme may be compiled as an anthology and pasted in a scrapbook for future reading in the class "library." Writings, stories, collections, or books can be long or short and accumulated in individuals folders for an exceptionally accurate and detailed account of a child's progress in writing. One of the strongest assets of written performance is its permanence and ease of collection, which make refinements and the slightest progress easily accessible and detectable. Any written document can be progressively modified in terms of alternatives for spelling, punctuation, descriptive words, expression, and sequencing of ideas which can be considered and reconsidered for children individually or as a group, as in a group project or play.

Labeling the contents of the classroom, notewriting, letters, and book reviews can all be considered and designed with aids for a convenient limiting of alternatives. The child can determine whether to work on the formation of letters, words, or meaningful expressions, or all three. Permitting the child self-selection in the aids and levels of effort can be a self-diagnostic device in itself. The child can reduce alternatives at his own pace, in the direction of his own interests. The child may choose his own writing tasks, or tasks may be provided for him with an opportunity for a considerable range of interests from which to select. Consider the alternatives and the selections that might be considered in the following example from Lamberg (1974, pp. 10-11); whatever the level of the child:

Step One: The purpose of this step is to write down a lot of different memories. These memories will be used as the subjects of your narratives.

Directions:

a. You will be writing as much as you can in fifteen minutes.
b. Before you start writing, look around the room until you see something that reminds you of something that happened to you, some memory.
c. When that memory comes to mind, write it down.
d. Then ask yourself what else you are reminded of and write down whatever comes to your mind.
e. Once you get started, let your mind go from one memory to another and put down everything that comes to mind.
f. Start your list of memories on the opposite page.

Step Two: The purpose of this step is to choose one of the memories in your list as a subject for a narrative.

Directions:

a. Read over your list of memories and
b. Ask yourself—which memory would I like to write about?
c. Choose the memory and circle it.

Step Three: The purpose of this step is to write as many details as you can about the memory. The details will be the material for your narrative.

Directions:

a. Under the question (on the next page) "What Was It About?" write the words you circled in Step Two.
b. Think about this memory and get ready to write down everything that comes to mind.
c. Write down the details under the question "What Happened?"
d. Write as much as you can in fifteen minutes.

IV. Holistic Approaches

Holistic approaches have been advocated in reading (Douglas, 1973) and language arts (Moffett, 1973). The language arts or the language experience approach are exemplifications of this (Durkin, 1972, 1974; Lee & Allen, 1963; Moss, 1975; Pflaum, 1974; Stauffer, 1970). An advantage of a holistic or systems approach is that the complexity of the entire task can be reduced significantly when it is approached as a whole rather than as a collection of independent components (Laszlo, 1972). Some things are just more important than others. Function has priority over structure (e.g., when the structure exists to serve the function or realize a consequence). Effective communication as demonstrated by a reader's response to writing has priority over the particular form of the expression. And attention to every single structural component is typically an unnecessary and overdetermined constraint if it has to be done all at once. For example, it would be impossible for a reader to attend to every structural detail of print and still be an efficient reader (F. Smith, 1971).

Making books (Moffett, 1973; Moss, 1975), comics and myths (Kohl, 1974), and producing plays (Moffett, 1973) are examples of holistic approaches. All aspects of language can be brought to bear in these productions. All the parts can exist in functional relationship to the whole. In such a context, meaningful consequences exist in a far fuller and richer connection than they are likely to exist in any one part independently. Furthermore, the complete context provides aids for selection which can facilitate the functional and structural choice of any one component. The selection of alternatives is reduced by context determination. Overdetermined aids for making a selection thus become in-

creasingly less appropriate for the more organized and more meaningful expressions, particularly as the more essential structural-functional features become increasingly visible and distinguishable from the more irrelevant and unnecessary (F. Smith, 1971).

To the extent that any complex system is organized, interdependency among its parts would be a feature distinguishing it from mere collections of chaotic aggregates. There is convincing rationale and evidence for a substantial relationship between motor and verbal development (Wolff, 1974; Wolff & Wolff, 1972; Zaslow, 1966) as well as between language variables in children (Early, 1960; Winter, 1957), especially between reading and writing. A constructive view of perception (Neisser, 1966), for example, argues that what we see is determined to some extent by how we put it together. This would seem to be supportive of the view and evidence that early writing leads to early reading (Durkin, 1966, 1972, 1974; Hildreth, 1963; Torrey, 1973). In addition, there is the rather convincing evidence from studies indicating that manuscript writing is more effective in teaching children to read print than cursive writing (Long & Mayer, 1931) and that it facilitates the development of spelling and the number of different words written as well as reading, in comparison to cursive writing (Cutright, 1936). It seems clear then that there are conditions in which early writing can facilitate early reading. And certain kinds of writing skills are more facilitative than other kinds.

As with oral language acquisition, visible language may develop best as an interacting whole in relationship to all language skills and all human skills. In contrast to the Great Debate of order over which comes first, the whole or the part (Carroll, 1972), it may be more proper to see the issue as not an either/or but as providing the child with whichever alternative moves him in the fastest progress, moving him wherever and whenever he is ready to move, writing stories whenever the child is ready and going into spelling whenever the child is ready for that, giving him the opportunity to choose that alternative, on all levels. The question then becomes: What is the measure of progress? What is the scale of values? Which ones have precedence in terms of value of importance rather than learnability?

Generally, a holistic competence would have more value than any of its component competencies since a holistic attainment can be assumed to contain multiple component competencies within it. This does not mean that all learning should occur first and exclusively on that level. Rather, the argument is for making a holistic alternative available to the child whenever it also results in progress (preferably at that level also). If the child is writing better and better stories or essays, more and more easily readable (according to acceptable criteria), let him continue. However, if, for example, he always misspells certain words without making improvement and progress in general has leveled off, a procedure that focuses on that problem can appropriately be implemented. It may also well be that some children do better by moving analytically and serially, step by step, while other children do better by concentrating on a holistic approach (Daniel, 1973). And different children may have their own optimal combination of the two if they have that choice to select from.

In brief, the argument is that the choice between part or whole be included in the consideration of alternatives from which the child can select. If the child prefers to generate a list of different ways for writing a letter, if he wishes to see how the varieties "look" before making his choice in regular writing, he should have this opportunity. Likewise, if he wishes to write a story, even though he is unable to spell any word in standardized form, he should have this opportunity also. Obviously, his choice cannot be independent of the context in which he is in, which includes the desirable goals of the teacher also. But that context, whatever it is, can permit an accommodation that at some time allows him some choice between the whole and a component. And that choice need not necessarily be a mutually exclusive one.

V. Research

Information on effective and efficient improvement of children's writing is obtainable from individual-centered (intensive individual) designs (Risley & Wolf, 1973; Shapiro, 1966; Sidman, 1960). Unfortunately, individual-centered designs applied to language-type skills such as Bijou (1968), Gardner (1969), Moxley (1970), Premack (1970), and Sidman (1974) are all too rare

(Editors, 1974), even though they are eminently applicable to teachers in the field (Hall, Cristler, Cranston, & Tucker, 1970). It is a very straightforward procedure in fact for each child to chart his own progress (Bates & Bates, 1974).

Researchers in education, however, have generally preferred to follow a highly overdetermined monolithic algorithm for research and persevere (or persever) with aggregate-centered designs (e.g., so-called "classical" experiments of a hypothetico-deductive null hypothesis test of significance model with one-shot cross-sectional samplings requiring statistical manipulation to tease out aggregate tendencies). The effect has been more to the cultivation and preservation of theories than to effective improvement of individual performances (Bakan, 1967; Moxley, 1974a).

The external validity of individual-centered designs rests on replication and obviously does not preclude using several individuals simultaneously or in any appropriate sequence. The essential feature is for individual data to be collected over time on one or more individuals, reflecting progressive within-individual changes. In contrast to the meager information available from typical tests of significance (Bakan, 1967; Meehl, 1967), such designs can provide a wealth of information on performances and the conditions of those performances in which complex individual organisms (as opposed to chaotic aggregates) engage as well as an opportunity to detect significant patterns (Simon, 1973).

Summary

In the view of writing as uncertainty reduction and information processing, it is critical for the child to be able to make selections from considerations of alternatives. The advocacy here is to provide the child with aids for writing that simplify the selection process at whatever level he is interested in, allowing the reduction of alternatives to proceed in stages. Children should also be encouraged to overtly express their alternatives and not merely their final conclusions. In contrast, over-determined algorithms and rules that jump to conclusions leave the child with either no help or more than he needs. They typically result in (1) inaccuracies without provision for remediating these deficiencies, (2) an atomistic bits and pieces approach without a way for coherently

putting the parts together, and (3) an absence of individualization, ignoring any differences between children.

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Line Transmitter Installation—
A Poem in the Environment

Mark Mendel

OJOS NUMEROSOS is a poem of twenty-three three-line stanzas. It was written to be painted on the sides of buildings, on viaducts, and on other urban surfaces where graffiti is typically found. The verses are in random series and are interchangeable within the poem. They form a chain in the experience of the person moving about town. People confront this poem as they do graffiti or corporate-graffiti/advertising every day. Poetry predates writing and printing. The recent tradition of poetics as a possession of the educated elite grew from its confinement to the printed page; I want this poem to fit the viaduct as the sonnet was once felt to fit the page. This is the sprayed word—the continuous simultaneous transmission of a poem into the environment.

OJOS NUMEROSOS is a poem of twenty-three three-line stanzas. It was written to be painted on the sides of buildings, on viaducts, and on other urban surfaces where graffiti is typically found. Each stanza is painted on a separate wall, randomly, within the project area. The paintings are roughly ten by twenty feet. I determined the three-line structure of the stanzas with a standard lift of metal building scaffold in mind. The three=step lift is as integral to the poem's structure as it is to the modular construction of the buildings themselves. This form is derived from the poem's concept rather than from an archaic literary form. I want the poem to fit the viaduct as the sonnet was once felt to fit the page. I call this verse the scaffold stanza. The order of verses is not predetermined. They are a random series and are interchangeable within the poem. The sequence and number of verses seen by a single reader is the complete poem for that reader.

The verses taken together form a chain. The poem is a chain to be experienced by readers driving or walking in any pattern through the community. The brevity of each stanza allows someone driving or stopped in traffic to read an entire link at once.

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This mechanism for presenting an idea to passengers in a moving car, one fragment at a time, originated with the old Burma-Shave signs along rural roads.

People will confront this poem as they do graffiti, or corporate-graffiti/advertising, every day. Wall murals as art have been accepted by people conditioned by billboards, while poetry remains shackled to the page, confined to bookstores and libraries, out of sight for most people. Modern poems are unfamiliar if not unknown in our public culture. Except for rare recordings and broadcasts the public scale of poems is no larger than that insidious fine print that never gets read. Confined as it is, poetry honors the institutions which harbor it. As a mason by trade, I would like to see the work of bricklayers and carpenters so honored. Rather than write a poem about the environment, I have begun to create an environment of poetry or at least one which includes it as it includes other public writing.

The objective of painting a poem on a wall might be no more than exposing many to a poem in a new way. But this poem, OJOS NUMEROSOS, forms a chain in the experience of a person moving about town. The experience of discovery is his. In electrical terms, the reader's visual contact completes the circuit. This is important. In his poem, "Of Being Numerous," George Oppen says:

> One must not come to feel that he has a thousand threads in his hands
> He must somehow see the one thing;
> That is the level of art
> There are other levels
> But there is no other level of art.

The technique of spraying paint on public walls is one that has yet to be accepted by any but the young. But if, as Margaret Mead suggests, only the young are truly native to a culturé of constant accelerated change; if the young must teach this culture to their elders; then we must begin to spray poetry. If the press is obsolete, so is the poster. Paper that comes between the poem and the brick is both extraneous and wasteful. Finally there is an outlaw value in the brightly-colored, sprayed word. Daring as

Rimbaud's "thief of fire," a high school drop-out finds his political voice with a can of Dayglo-Saf-T-Orange. Using technology's newest paintbrush, people long considered verbally inarticulate have expressed the anguish of their oppression.

I began spraying this poem in the eastern half of Cambridge, Mass., in May 1975. I used a Wagner 300 airless paint sprayer. As of this writing there are ten verses up and I hope to install another five verses this year. Obtaining permissions for the walls has been an arduous job, and the entire poem may take a while to install. A different lettering style has been used for each verse; accompanying graphics are minimal.

This is the sprayed word: a poem fired from a gun, a midsummernight's special—the continuous simultaneous transmission of a poem into the environment. Poetry existed long before writing. The custom of setting poems in type and printing them in books is a fairly recent phenomenon, and is perhaps to blame for poetry's recent reputation as something for an educated elite. It is exciting to see OJOS NUMEROSOS springing up in the everyday environment rather than its serving a term in that solitary confinement between the covers of a book.

In *The Uses of Disorder* Richard Sennett writes that the chaotic urban situation is a healthy one for human growth: a complex and challenging social matrix in which people can learn the value of change, where they might develop a humanist ethic for dealing with an unpredictable world. Perhaps someone reading this poem—painted on various walls, in a medium usually associated with disorder—might feel less afraid of urban chaos; might even feel, there on the street, the things of which poets write.

The poet's eye in a fine frenzy rolling,
Doth glance from heaven to earth, from earth to heaven;
And, as imagination bodies forth
The forms of things unknown, the poet's pen
Turns them to shapes, and gives to airy nothing
A local habitation and a name.

—Shakespeare, *A Midsummernight's Dream*

WHY POETRY SMALL AND CRAMPED

Why poetry small and cramped, why poetry starved and mean, thin-lipped and sunken-cheeked? Why these pams, these narrow-shouldered negatives? (The best we can say is that they're seed catalogs.) And why those staring eyes, so carefully fixed on the photographic plate? Why no lips at all but in their stead the practiced line of anger and the clamped jaw? Why always the darkening halo, so seemingly satanic? (The best we can say is that they are trying to mirror our lives. Do they know our lives? Can they read past the symbols of our trade?) Why so much attention to the printed page, why the cosmetology of font and rule, meters laid on like fingernail enamel? Why these lisping indentations, Spanish question marks upside down? Why the attractive packaging of stanza? Those cartons so pretty, shall I open them up? Why the un-American-activity of the sonnet? Why must grown people listen to rhyme? How much longer the polite applause, the tickle in the throat?

What will fatten you, skinny little book? What will put lead in your pencil? All of you dust-collecting seed catalogs, to the Goodwill you go, to the broad stench of the paper mill! Seed catalog, go pulp yourself!

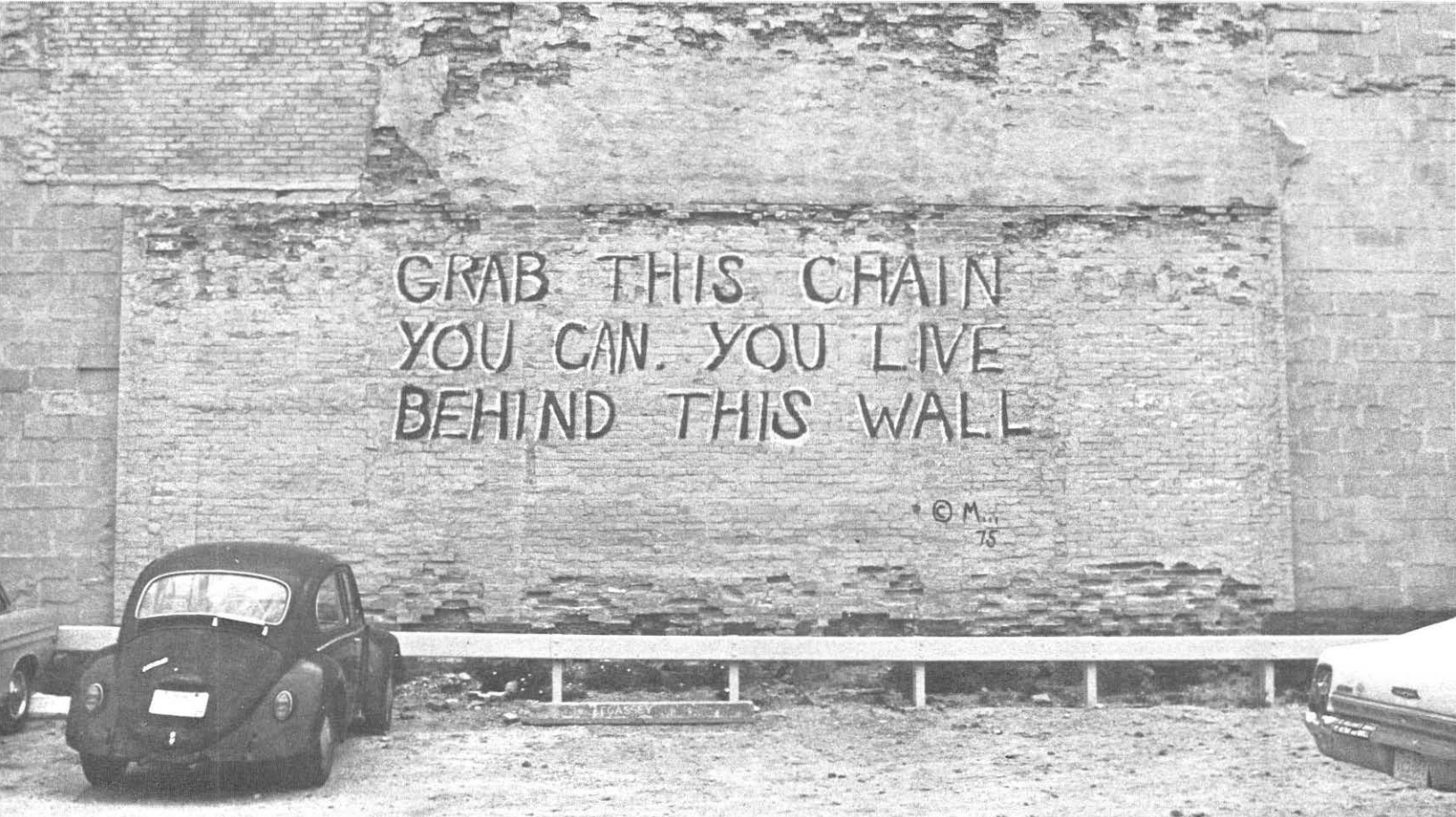
Poems, flowers of language, if that's what you are, grow up in the air where books come true. And you, thin packet, let your seed fly, if you have any.

—Karl Shapiro

Photographs are by Jonathan Newman, proprietor of the 247 Gallery in Salem, Mass.

Orion Research (medical instrument factory), Putnam Avenue

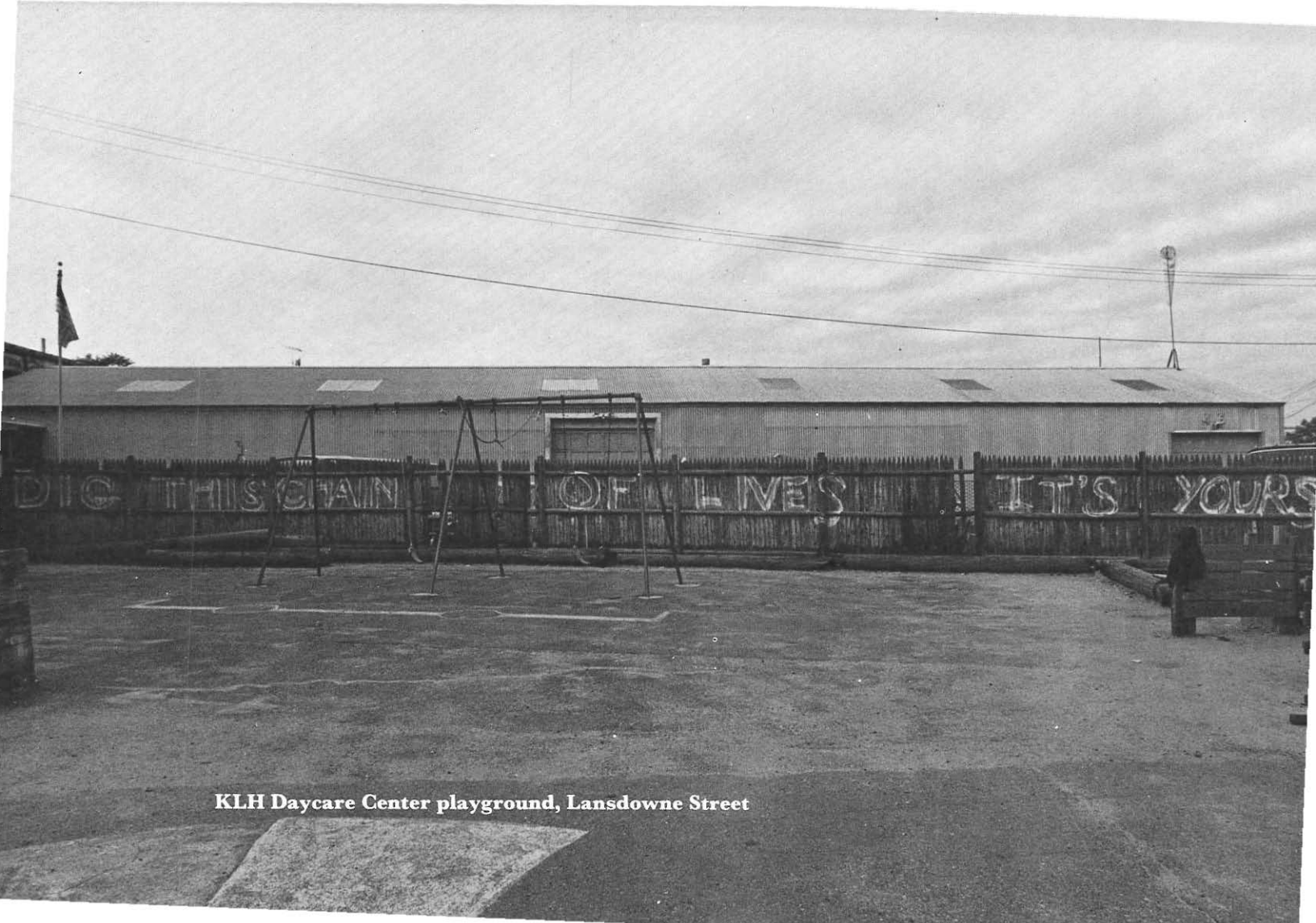
KLH Daycare Center playground, Lansdowne Street



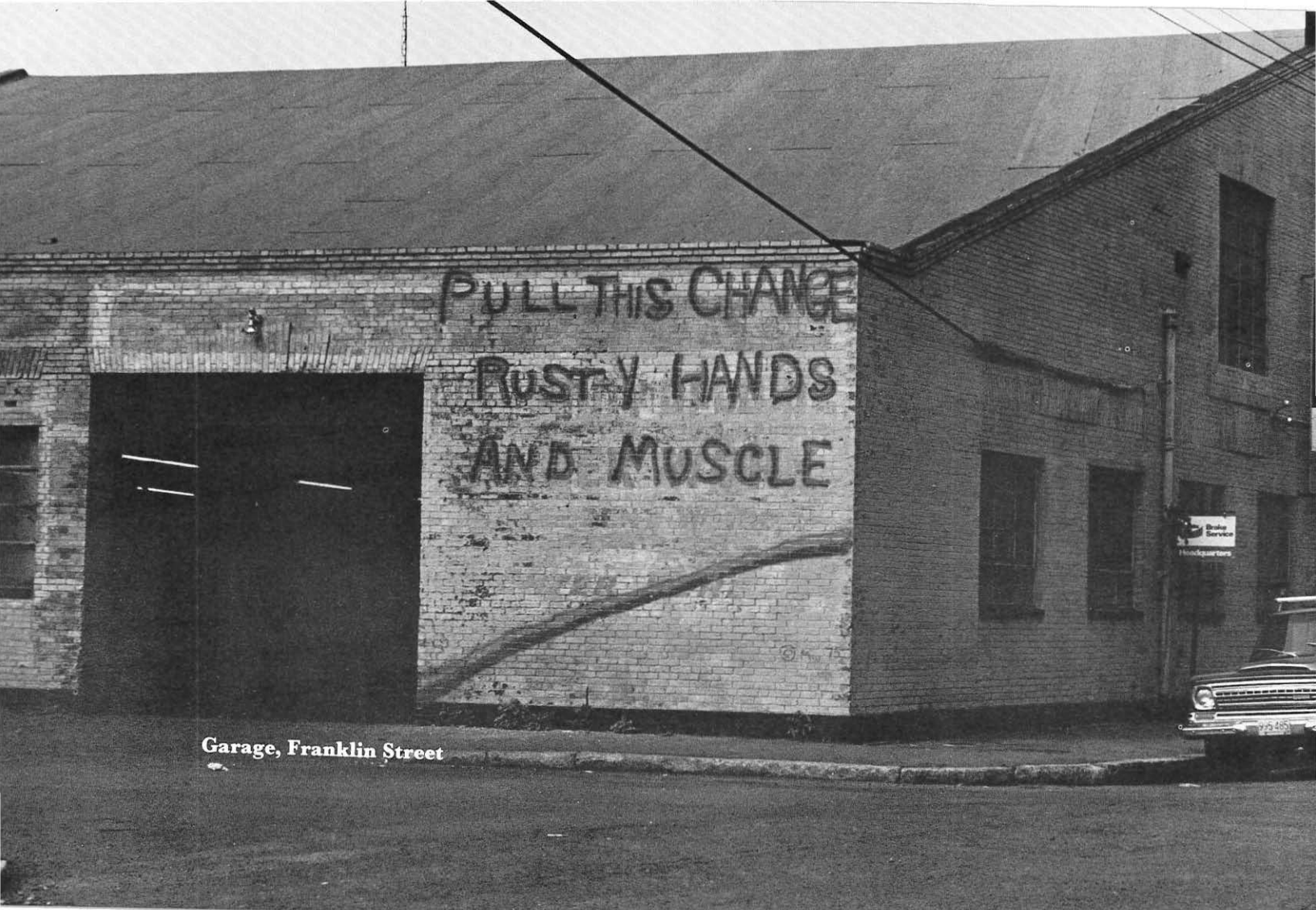
Deuce of Clubs Bar, Main Street

Women's Health Collective, Hampshire Street

Osborne Street Garage, Massachusetts Avenue



KLH Daycare Center playground, Lansdowne Street



Garage, Franklin Street

Technology Garage, State Street

Baskin Robbins Ice Cream Store, Norfolk Street

Vinnie's Luncheonette / MBTA Station, Kendall Square

Methods of Research in Renaissance Manuscripts

Paul Oskar Kristeller

The use and study of manuscripts brings us into direct physical contact with the past, both enriching our original source material and opening new research dimensions and perspectives. Unfortunately, manuscript references in text editions or secondary studies are often wrong, incomplete, or antiquated. Meticulous, first-hand searching out of individual references is most important, as is direct inspection of the manuscript or its reproduction. Whenever practical, it is advisable to scan or read completely and systematically all available printed catalogues and handwritten inventories. Special difficulties in finding pertinent manuscripts—even in familiar collections—are discussed. Each manuscript is a unique research resource—deserving careful preservation, adequate cataloguing, and greater accessibility.

It is quite evident that manuscript research has occupied for a long time a very important role in many historical disciplines and in the study of many periods. To be sure, a good deal of work can be done on the basis of printed sources, and there have been many respectable historians who never made direct use of any manuscript source. Yet as Augusto Campana once said, a scholar who never uses manuscripts lives as it were on his inheritance *(vive di rendita)* and merely benefits at second or third hand from the work of earlier scholars. The use and study of manuscripts brings us into direct physical contact with the past which we are exploring; it not only increases and enriches our source material but it also broadens our outlook and opens up new dimensions and perspectives. I trust no one will object if I say that manuscript scholars constitute a kind of élite among the historians, and I apologize in case I have offended by this remark the liberal sensitivities of anyone. I remember that years ago an influential scholar stated that the study of manuscripts was unnecessary since all the important texts have been printed. This statement is evidently

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false, but I accept the challenge and should like to claim for those of us who publish inedited texts the magic power of conveying on the texts that intrinsic importance which they previously, while unpublished or even unknown, obviously failed to possess.

I should like to add that manuscript studies have made great advances in recent decades, especially in my area of interest. It is not only the greater facility for traveling, the progress of cataloguing, and the use of photostats and microfilms that have made these advances possible. There has also been a notable progress in palaeography, and the method, first practised by Giovanni Mercati and others, to consider a manuscript not merely as a statistical unit in the calculus of variants but as a historical individual with a unique character and physiognomy, has been extremely fruitful.

In line with my own work, I shall speak primarily of manuscript books rather than of archival documents (which present different problems and require different methods of investigation). Manuscript books have been studied for a variety of reasons, as we can see from the extant literature. Palaeographers have been concerned with the history of script as such, bibliographers with the methods of describing manuscripts and with the history of libraries. Others have studied the history of the book trade, or the history of book bindings. There has been great interest in the history of book illumination, especially among art historians. Yet the majority of scholars including myself has been interested in the content of manuscripts, and in the study and editing of texts as they are found in manuscripts. The textual interest in manuscripts includes by implication, as auxiliary, all other aspects of manuscript research including heraldry, for it is often important to identify the first owner of a manuscript through the coat of arms painted on its title page. The textual interest naturally varies according to the professional interests of each scholar. It may cover the various vernacular literatures as well as classical Greek and Latin, Byzantine, medieval and modern Latin literature, or historiography, or the history of the arts and of music, of the natural sciences, mathematics and medicine, of the occult sciences, of rhetoric and grammar, scholarship and philology, of jurisprudence, theology and philosophy, and of many more fields. My own interest in

manuscripts began with Marsilio Ficino and the Platonic Academy of Florence,[1] and gradually expanded to cover the history of philosophy from 1300 to 1600, including the history of scholarship, of rhetoric, and of several other disciplines. For certain subjects such as philosophy, rhetoric, and medicine, the history of schools and universities, the classification of the arts and sciences, and the translations and commentaries of classical authors, my curiosity has sometimes been extended back into the earlier medieval centuries and even into late antiquity, and forward into the seventeenth and eighteenth century.

In the course of my work, I have gradually developed a method of research that I was not taught when I was a student but that I learned partly from the example of other scholars and partly through my own experience. I hope this method has had some results, and I am sure it will have more when it is followed by other scholars in various fields. This method has its limitations, as I know perfectly well, and there are other methods that yield different results that I could not hope to attain with the one I practise and teach and shall try to describe. For example, the late Tammaro De Marinis looked at all manuscripts that had old bindings,[2] and in this way he discovered texts that had escaped my attention because the name of the author was unfamiliar to me and because the respective inventory failed to indicate the century of the manuscript. Giuseppe Billanovich and his pupils look at all manuscripts of a classical author such as Livy or Seneca,[3] and thus discover not only copyist's notes and glosses but entire prefaces, epigrams, and commentaries that would greatly interest me but that I could not possibly catch with my method or within the time at my disposal, for in many instances, the inventories indicate nothing but the classical author when listing the manuscript.

When we are trying to locate the manuscripts of a given text or author, it is logical to begin with the manuscripts mentioned in previous editions or studies. However, it is advisable to verify in each case the manuscript and its shelf mark through catalogues or inquiries. For unfortunately, manuscript references in text editions or secondary studies are often wrong, incomplete, or antiquated. Many scholars working with individual manuscripts are unbelievably sloppy in citing their shelf marks; shelf marks are

being frequently changed in many libraries; and many manuscripts and entire collections have been transferred or destroyed after the time when they were last used and cited. A manuscript in Berlin was cited with a wrong shelf mark by Theodore Mommsen,[4] and thus a later scholar cannot avoid disclosing to the informed reader, from the shelf mark he cites, whether he has seen the manuscript or merely follows Mommsen. In another case, I was assured by a distinguished scholar that a shelf mark he gave me for a manuscript in Florence was the only one cited in the scholarly literature, but it turned out that it was a distorted version of a shelf mark that had not been in use since about 1800, thus proving with nearly mathematical certainty that no scholar referring to the manuscript had ever seen it since that time. When I once caught another noted scholar at citing a wrong shelf mark, I was tempted to suspect that he had done so intentionally in order to trap those later scholars who would cite the manuscript after him, but without giving him as their source, without actually having looked at the manuscript. I mention these examples in order to emphasize the need for accuracy in giving the shelf marks of manuscripts. We should never assume that we can safely rely on the manuscript references of previous scholars.

Moreover, we should never feel sure that previous editors have exhausted the supply of manuscripts needed for the edition or study we are undertaking. Scholars of the past tended to be selective in the use of manuscripts, their opportunities for traveling were limited, they had no microfilms, and their resources in available printed catalogues were much smaller than ours. I remember a case where a modern editor asserted that a manuscript which Nicolas Heinsius claimed to have seen in Heidelberg must be considered as fictitious. One look at the printed catalogue of the *Palatini Graeci* in the Vatican showed me that Heinsius was right and that the manuscript still existed. The example merely shows what I knew anyway, namely that Heinsius knew more about manuscripts than any classical scholar of the nineteenth, if not of the twentieth century. The lesson is obvious, though uncomfortable: we should utilize whatever information we may derive from older editions or studies, but we must make a fresh start when trying to identify and to locate the extant manuscripts of a given text which we want to edit or study.

Such an inquiry must obviously begin with the printed catalogues of manuscripts and with their indices. For this phase of our work, we must have access to libraries which have a sizeable, if not complete, collection of the chief catalogues. Such collections are available in the Vatican, in Florence, Paris, or London, and in this country, in Boston, New York, and Washington. None of these collections is quite complete, though in some instances they have tried to supplement their holdings by acquiring some of the rarer catalogues in microfilms. The main purpose of my bibliography of catalogues was to make fellow scholars independent of the chance holdings of a given library and to remind them of the catalogues which they should try to look up.[5] This bibliography is, of course, far from being complete, and it is by now antiquated.

In using the indices of catalogues, we must look for our author under any possible form in which his name might be listed: first name, last name, place of birth, nickname, in Latin as well as in all the pertinent modern languages, especially his own and that of the author of the catalogue. We must also beware of certain tricks, for in many cases the index is not found at the end of a volume, but at the beginning or even in the middle, and often a volume has more than one index.

This procedure is never quite sufficient, for many important collections of manuscripts have no printed catalogues or no complete printed catalogues,[6] and many printed catalogues have no indices.[7] Yet most collections, and certainly all large collections, have handwritten or typed inventories or indices that can be used on the spot. In order to utilize these handwritten indices, we may either travel from library to library, which is pleasant and interesting but expensive and not always possible, or we may send a circular letter to the major libraries and to the libraries likely to have manuscripts of our author, and ask the librarians to check their indices and to report to us any manuscripts that may be of interest. We are likely to get an answer in the majority of cases, especially if we explain our project, write in the language of the respective country, and enclose international reply coupons. In the case of some very large and complex collections such as the Vatican Library, the National Library of Florence, or the British Museum, the search for the manuscripts of a given author may require a full

day's work or more, and hence we may have to hire a local research assistant for our purpose. In some instances, unpublished inventories and indices are available on microfilm in this country —especially at St. Louis University, at the University of Notre Dame, at St. John's University in Collegeville, and especially at the Library of Congress—and a visit to these libraries, or a correspondence with them, may be extremely helpful.

The method which I have described so far has its limitations, as we shall see, but it is a perfectly respectable procedure, and it is the only feasible method whenever we are concerned with only one text or author. I followed it when I edited Ficino, and it yielded several interesting finds such as the *Corpus* of Ficino's first translations from Plato and a number of previously unknown letters. What we fail to catch with this method, and this is quite excusable, are manuscripts in small uncatalogued or unindexed collections; manuscripts which contain our text without the author's name or with a wrong author's name; miscellaneous manuscripts not properly analyzed in catalogues or inventories; and occasionally manuscripts properly described in a printed catalogue but not properly recorded in its index.

Beyond the method which I have described so far, there is another and better one which I learned from Cardinal Mercati and from Ludwig Bertalot and which I began to practise early in my career as a manuscript scholar. This method is much more laborious and time consuming, but it yields richer and more complete results. On the other hand, this method is wasteful when we look for only one text or author, and it is worth the effort only when our search involves a broad group of manuscripts of a certain type or subject or period. The method consists in scanning or reading completely and systematically all printed catalogues and handwritten inventories that we can lay our hands on, from beginning to end. In this way, we overcome the lack or inadequacy of indices, for we hit upon the descriptions of manuscripts that are not reported, or not adequately reported, in the indices. We also come upon anonymous or pseudonymous copies of the texts in which we are interested, since we shall recognize them whereas the author of the catalogue may have failed to identify them. Moreover, we acquire a sense of the history and

physiognomy of a given collection that will teach us what we may or may not expect to find in it. Finally, we shall find authors and texts for which we did not look and whose very existence may have been unknown to us but which may turn out to be of great interest, either directly or indirectly, because of their personal connections or subject or literary genre, or because they fit into a pattern that we are trying to explore.

The last step of our inquiry, after the checking of indices and the scanning of catalogues, is the direct inspection of the manuscripts, or at least of their reproductions in photostat or microfilm. This is certainly necessary when we are editing a text, for we want to collate all extant manuscripts of the text, preferably for the whole text, but at least for certain passages in order to select the more important manuscripts when the extant manuscripts are too numerous to be collated in their entirety. Even when we do not wish to edit a text, the actual inspection of a manuscript is often necessary if we want to be sure of its content, or if we wish to verify certain details. When we inspect a manuscript, we may often find more texts in it than the catalogue indicates, or we may identify a text wrongly described in the catalogue. When a catalogue description is clearly wrong or incomplete, only the actual examination of the manuscript can tell us what it contains. Sometimes the inspection of a manuscript will disclose other features such as the identity of a scribe or first owner that the description may have failed to tell us. If we want to know whether a manuscript is an autograph or has autograph corrections, or whether it was written in a specific country or not, we shall have to look at it, except in the rare cases where we dispose of an excellent recent catalogue.

Now it is quite clear that we cannot possibly see all manuscripts that are of potential interest, especially when our interests are broad and encompass a whole period or genre rather than a single author or text. Our opportunities for traveling are limited, and so is our life. It is for this reason that I came to realize, when planning my *Iter Italicum*, that I could never hope to see all the manuscripts which I was going to list. I decided to see as many as possible, to be sure, but I was forced to select for inspection only those that came closest to my special interests, and those for which the catalogue descriptions impressed me as wrong or dubious, and

where only the actual manuscript could answer my doubts and satisfy my curiosity.[8] I found especially frustrating the cases where a collection lacked a topographical inventory and where I had to start from an alphabetical index. In such cases it is often impossible to reconstruct the content of a miscellany except by looking at the manuscript itself, and hence it is necessary to examine many more manuscripts than in libraries that have a good topographical inventory.

I should like now to point out some of the special difficulties which we encounter in trying to locate manuscripts pertinent to the subject we are investigating. First of all, besides the well known manuscript collections found in major or middle-sized libraries, there are many small collections that are not well known and difficult of access. We may not even know of their existence unless a local scholar or even a tourist or hotel doorman calls them to our attention. An important private collection is even described in a printed catalogue, but the catalogue has such a vague title that nobody can recognize the collection described in it unless he learns this indispensable fact from some outside source.[9] Manuscript books are not only found in public libraries, as well as in private collections and in bookshops, but also in archives, museums, and learned societies. I learned through a chance reference that a museum had an important manuscript collection that was apparently unknown even to the librarians and archivists in the same city. A friend told me repeatedly that another museum had some manuscripts, but my inquiries addressed to that museum remained without answer, and I was even assured by a local librarian that there were no manuscripts. Yet this year I read in the inventory of the local library that one of its modern manuscripts was copied from an old manuscript in that museum. Thus I finally know at least of one manuscript in that collection, and hope to find out next year whether there are others. For when I locate a manuscript in a collection of which I had not heard before, I act as the old gentleman who visited the Metropolitan Museum to see Rembrandt's newly acquired *Aristotle*, and then turned around and asked one of the guards whether they have got any other pictures in that museum. I tried to resolve some of these mysteries in my *Latin Manuscript Books*, but there are many more

that are still unresolved, or that at least I am unable to resolve.

There are other peculiar difficulties which we have to overcome. Any self-respecting large library has a number of collections that are kept separately from its main collection and that are known in Italy as *Fondi Minori*. A scholar who visits the library and checks its major collections is not always aware of these separate smaller collections, and nobody is likely to tell him unless he specifically asks about them. It took me many years and even decades until I learned of certain minor collections kept in libraries which I had visited many times and thought I knew reasonably well. A special trick which I also originally learned from Mercati is to start from an old inventory and then to identify as far as possible the present location of the manuscripts listed in it. It is through this detour that we often come upon interesting manuscripts that are inadequately described in the inventories currently in use. The concordance published a few years ago for Montfaucon's list of the *Reginenses Latini* is so valuable because it helps us to find the manuscripts which Montfaucon lists with numbers that are no longer in use, and it is even more valuable because Montfaucon's descriptions are often superior to those of the modern inventories, and because he often mentions texts that are skipped in these inventories.[10] This year, Mons. Ruysschaert identified for me several more of the manuscripts listed by Montfaucon, and one of them turned out to be a rich humanist miscellany to which the inventory dedicated only one line. I also scanned in the Vatican Library a group of eighteenth-century miscellanies by Galletti,[11] and the late copies contained in these manuscripts led me back to several early manuscripts which had escaped my attention, including one from the early sixteenth century that contained a number of unknown and extremely interesting texts.

This leads me to a subject to which I have alluded already before: many old catalogues and inventories, and many editions and studies, old or not so old, give shelf marks that are either wrong or incomplete or antiquated. There are many important libraries where the old shelf marks are causing trouble. In some cases, the only printed list for many manuscripts is quite old, and it often gives antiquated shelf marks, or no shelf marks at all. When a library later suffered losses, or when there is no concord-

ance for the old catalogue, it is not always easy or even possible to identify a manuscript listed in that catalogue. In another library, the shelf marks have not been changed, but the printed catalogue is incomplete, and a number of manuscripts, some of them listed and some not listed in the printed catalogue, were transferred some time ago to another library and have received new shelf marks. Another library has as its only key a handwritten inventory from the early nineteenth century that gives only shelf marks that turn out to be antiquated and also to be class marks common to many manuscripts rather than shelf marks distinctive of individual manuscripts (they may be compared to the class marks in the New York Public Library where a book within a group can be located only through the binder's title on its back which is indicated in the catalogue but often quite different from the real title). For a long time, there was no concordance between the old class marks and the new serial numbers used for the individual manuscripts of the library in question, and thus, the identification of each manuscript has been a subject of a separate investigation. Some years ago, just when a competent librarian had started with the useful job of compiling a concordance between the old class marks and the new serial numbers, the situation was compounded by transferring a large part of the collection to another library. A concordance between the latest serial numbers and the actual numbers was subsequently compiled and published, but in the cases where we know only the old class mark, the task of locating the manuscript in either library has remained as difficult as before. When I worked in the library, I was much helped by the librarians to overcome my difficulties and to identify as many manuscripts as possible, but I was looked down upon with great scorn by a scholar from South America who worked on the manuscripts concerning Latin American history that happen to have been well catalogued. The gentleman obviously felt that it was due to my incompetence when I had to struggle so hard while he had an easy going with his own research. I cannot help repeating what I wrote elsewhere: a manuscript without a correct and complete shelf mark is like a person without an address; it cannot be found except with the greatest difficulty. Hence I have always made it my special business to be accurate and meticulous in citing the shelf marks of

manuscripts, and I urge all fellow scholars to follow the same practice. I have been scolded as pedantic by more than one classical scholar, but I should like to retort that they should stop speaking of the Parisinus of Vergil when there are over thirty thousand Latin manuscripts in the Bibliothèque Nationale alone, and probably several dozen manuscripts of Vergil.

I should like to describe next some of the typical results that we may expect from our investigations. They are roughly of three kinds. First of all, we may come across or discover new and previously unknown texts. They sometimes deserve to be edited, and always to be recorded and studied. Whether they should always be announced as news in a learned journal or even in a newspaper is a matter of taste and of circumstances. Opinions are, of course, divided as to what constitutes a discovery. A famous Italian scholar once criticized a young French colleague for having claimed the discovery of some manuscript texts although the manuscripts were duly registered in the handwritten inventory of the respective library and although their existence had thus been known to the director of that library.[12] Now I do not think that all library directors know, or should know, the content of all manuscripts in their collection, and hence I do not think it is a fruitful procedure for a traveling scholar, as I watched some scholars doing, to ask the librarian what manuscripts there are in his field of study, instead of looking himself at the indices and inventories. In any case, I do not think that the value of a discovery is diminished because the respective manuscript is listed in a handwritten inventory. On the contrary, I am willing to recognize as a discovery even a text listed in a printed catalogue and recorded in its index, provided that a scholar uses a manuscript for the first time and inserts it into the mainstream of research on the respective subject. If a manuscript has been cited before in the proper context, we can no longer speak of a discovery, but there is still some merit in editing a manuscript or in studying it more thoroughly even after it has been mentioned before.

The second result of our inquiry may be the discovery of additional manuscripts containing a text previously known. Such discoveries are the more important, the fewer manuscripts of the same text had been known before. It may be very important to

discover a second manuscript of a text previously known from only one manuscript, whereas it may seem less important when we find additional manuscripts of a text for which dozens or even hundreds of manuscripts had been known before. However, such additional manuscripts may have their special importance: they may contain significant textual variants or even author's variants, additional passages, prefaces, or epilogues; they may contain interesting dates, colophons, or notes, and thus tell us something about the date of composition of the work, or about the scribe and first owner of the manuscript; they may even supply a new and valid attribution for a text that had been before of unknown or uncertain authorship.

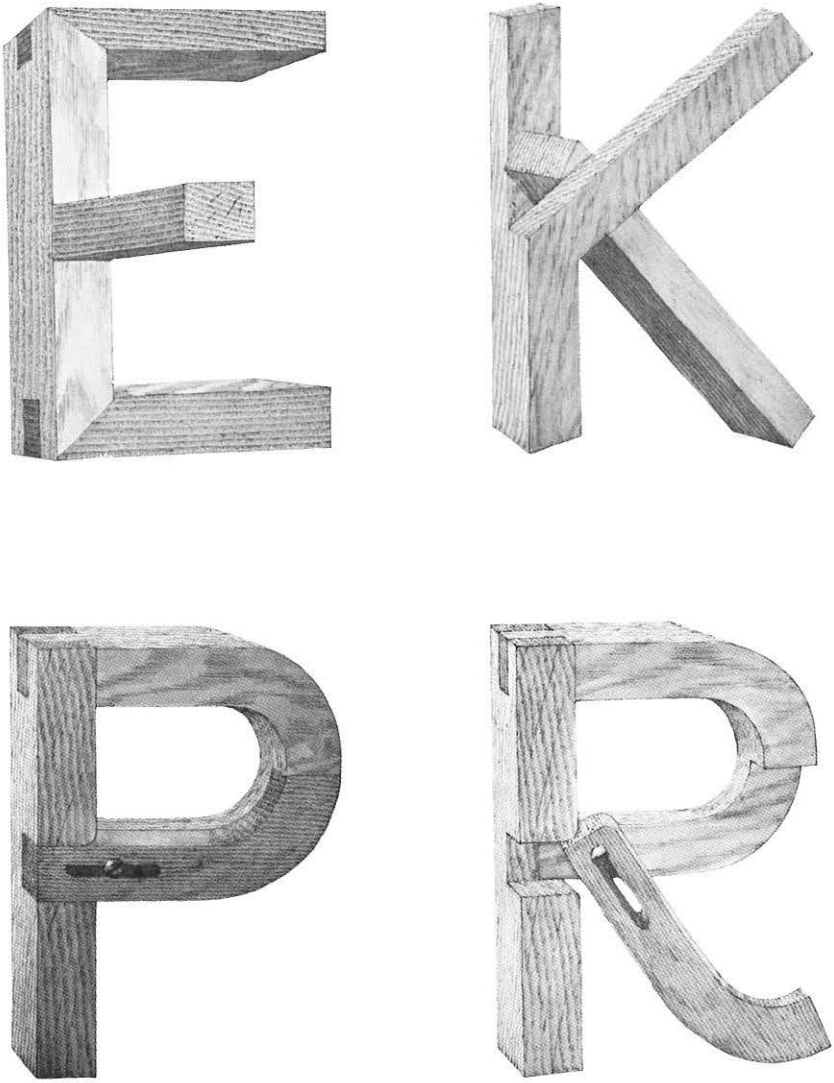
Thirdly, the discovery of additional manuscripts, even if they are unimportant for the text, may yield very interesting information of a different kind. The number of manuscripts of a given text provides us with a statistics of its diffusion, just as the number of printed editions does, and the information supplied by each manuscript about its own date and origin may help us to trace the diffusion of a text in terms of geography, of chronology, and of professional and social milieu.[13]

Manuscript research evokes a kind of passion or addiction, and hardly anybody who has ever tasted it is likely to relinquish it again. One factor is no doubt the close physical contact that manuscript research gives us with the object of our inquiry and curiosity. Another is the unending series of surprises that the study of manuscripts will bring us, because of the very fact that each manuscript is a unique individual rather than a member of a species as most printed copies are. Moreover, the constant accumulation and recombination of interesting details is inexhaustible, and apt to lead to ever new conclusions. The sum total of manuscripts scattered in the world form a kind of *Bibliothèque Imaginaire*, and in the fields known to me there is work for generations of scholars to come. Yet we depend on the careful preservation of these manuscripts which have suffered too many losses already during the past few decades; on the further progress of inventorizing and cataloguing them, for without that we cannot know of them or utilize them; and on their greater accessibility, especially in the case of small and private collections. We must also see

to it, for the continuation and progress of our work, that a sufficient number of younger scholars will receive the training which is needed for participating in this enterprise, and which will assure for them and for their work the kind of literacy that our field of study demands: languages, and especially Latin, and palaeography.

1. *Supplementum Ficinianum*, ed. P. O. Kristeller (2 vols., Florence, 1937, repr. 1973).
2. T. De Marinis, *La legatura artistica in Italia nel secolo XV e XVI* (3 vols., Florence, 1960).
3. G. Billanovich, "Petrarch and the Textual Tradition of Livy," *Journal of the Warburg and Courtauld Institutes*, 14 (1951), 137-208.
4. T. Mommsen, "Ueber die Berliner Excerptenhandschrift des Petrus Donatus," *Jahrbuch der Koeniglich Preussischen Kunstsammlungen*, 4 (1883), 73-89, citing the MS as Hamilton 458. The actual shelf mark is Hamilton 254. Cf. H. Boese, *Die lateinischen Handschriften der Sammlung Hamilton zu Berlin* (Wiesbaden, 1966), pp. 125-130.
5. P. O. Kristeller, *Latin Manuscript Books before 1600* (3rd ed., New York, 1965).
6. Incomplete are the printed catalogues of V. Rose and F. Schillman for Berlin, and of G. Valentinelli for Venice.
7. The only complete indices for the Nouveau Fonds Latin and the Nouvelles acquisitions latines in Paris are handwritten or typed.
8. P. O. Kristeller, *Iter Italicum*, 2 vols. (Leyden, 1963 and 1967). I hope to publish two more volumes.
9. *Catalogo della Biblioteca di un amatore bibliofilo*, Italia (sic), s.l.a. The library described is the Biblioteca Durazzo in Genoa.
10. (J. Bignami Odier), *Les Manuscrits de la Reine de Suède au Vatican* (Studi e Testi 238, Vatican City, 1964).
11. The notes and excerpts of Petrus Aloysius Galletti O.S.B. (s. XVIII) are found in Vat. lat. 7854-8066.
12. A. Favaro, *Archivio Veneto* 25 (1883) 431-432, reviewing L. Mabilleau, *Étude historique sur la philosophie de la Renaissance en Italie, Cesare Cremonini* (Paris, 1881).
13. For a good example, see J. Soudek, "Leonardo Bruni and His Public: A Statistical and Interpretative Study of His Annotated Latin Version of the (Pseudo-) Aristotelian *Economics*," *Studies in Medieval and Renaissance History*, 5 (1968), 51-136.

This article is a revised version of an address delivered at the First Saint Louis Conference on Manuscript Studies held at Saint Louis University in October 1974. It is reprinted with kind permission from *Manuscripta*, 19 (March 1975), 3-14.



Excerpted from *Anno's Alphabet: An Adventure in Imagination*. Mitsumasa Anno's alphabet book is made up of paradoxical *trompe l'oeil* paintings full of superreal details of plausible impossibilities and visual puns. New York: Thomas Y. Crowell Company. $6.95.

Comment: The Medial Aspect of Language: A Linguistic Framework for Literacy

John Mountford

Linguistics is the scientific study of language. Language, for the linguist, is a purely human phenomenon: linguistics is one of the sciences of Man.

The central discipline of linguistics is the description of languages, living or dead, written or unwritten; both cross-sectionally, as systems working at a point in time, and longitudinally as systems undergoing change with the passage of time. Such descriptions are often known as grammars—descriptive grammars of a state of a language, historical grammars of changing states of a language. This discipline of the description of languages—the study of languages *per se*—belongs to linguistics and to no other science. A grammar of English may include sections on its sentence-structure (syntax) and its sound-structure (phonology), as they are today or as they have changed down the centuries—in either case this is the exclusive province of linguistics. In this task of language-description, linguists make use of several interrelated levels of description: in addition to syntax and phonology, they are concerned with meaning-structure (semantics), vocabulary-structure (lexis), word-structure (morphology), script-structure (graphology), and discourse-structure (stylistics).

The details of this list of linguistic levels are not of importance here (the inclusion of the study of discourse-structure is tendentious, and its description as stylistics even more so); what matters is that the medial aspect of language is incorporated. Medial, in this use, is the adjective from medium and the reference is to the mediums of language; viz., speech and writing. The level of phonology studies the sound-structure of language in its realization in the medium of speech. The level of graphology studies the

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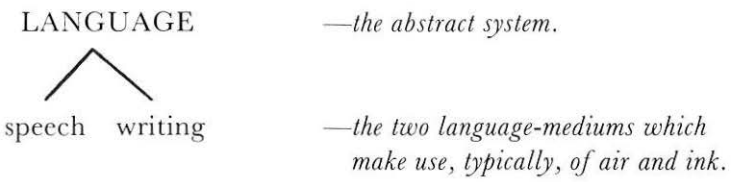
script-structure of language in its realization in the medium of writing. The relations between language (structured semantically, syntactically, lexically, morphologically, and stylistically) and each of its two normal mediums are the same—represented by the lines in the following:



This linguistic model differs significantly from the lay model, represented by the following:

The lay model is plausible in a culture in which the system of writing is phonological; e.g., Western Europe with its alphabetic writing-systems; it is not plausible in a culture in which the system of writing is non-phonological; e.g., China, with its "character" writing-system. Any writing-system is a system for realizing the grammatical units of a given language by means of visible shapes. When we read and write, we read and write not sounds, but sentences. The Western system of writing differs from the Chinese system of writing in that it takes advantage of the economy of realization furnished by the phonology in its phoneme-system. All languages have large vocabularies running into thousands of words, and all languages make the economy of representing each word by a "different combination of a relatively small set of sounds" (John Lyons, *Introduction to Theoretical Linguistics*, p. 54). The Western system of writing carries this economy over from the sound-structure to the script-structure; the Chinese system of writing doesn't. Words, in an alphabetic writing-system, are represented each by a different combination of a small set of letters (alphabet), and quite close correlations exist between the letter-

structures of words and the sound-structures of words. No such correlation exists between the stroke-structures of Chinese characters and the sound-structures of Chinese words. In order to take account of the variable relationship which exists between sound-structure and script-structure, we can add a dotted line to the linguistic model as follows:

The description of particular languages in terms of their grammar (in a narrower sense) and their phonology and graphology gives rise to general theory: for instance, that all languages have the same fundamental structure of semantics, grammar, and phonology. In making his description of particular languages, the linguist is always making use of general theory, applying categories which are language-general and distinguishing features which are language-specific: e.g., all languages have a system of phonemes; English has this particular system of phonemes.

Not all languages, however, have a system of letters—or even a writing-system. So that some languages have no level of graphology, because no ready-made writing-system exists for the linguist to describe. Nonetheless linguists always publish their descriptions in writing. The concrete meaning of grammar, which most of us learn first, is that of a book. And the word grammar itself comes from the same Greek root as graphology. The linguist describing a tribal language with no socially used writing-system, designs his own writing-systems for the sake of his description. The scientific study of language relies, like other sciences, on writing for its prosecution. This is not to say that oral grammars are impossible (Panini's grammar of Sanskrit was an oral grammar). What is meant is that in human history science has developed as it has *with* writing and not without. Some kinds of discourse and some kinds of social organization (viz., those characteristic of technological advance) have proved dependent upon writing. And the science of language itself owes its development to this medial aspect of language evolution.

Linguistics, however, is not confined to language description, though this is its central province which it shares with no other discipline. This central branch is sometimes referred to as linguistics proper. It can be called, for convenience, centro-linguistics, and can be pictured as being flanked by two disciplines, complementary to each other, and each overlapping with another science of Man. These two branches are sociolinguistics and psycholinguistics—respectively the study of language in society (the intersection of linguistics and sociology), and the study of language in the individual (the intersection of linguistics and psychology). Linguistics can thus be an umbrella term over the three branches, the central one and the two lateral ones.

In these two lateral disciplines, the medial aspect of language is crucial. The kinds of organization open to a society depend on the extent and degree of literacy within it; the kinds of mental organization open to an individual depend upon the extent and degree of his literacy: literacy underlies education in both.

To all three branches of linguistics the same dichotomies apply—general and particular, pure and applied, synchronic and diachronic.

It is with the second member of the last pair that this note is concerned—with the time axis in the study of literacy.

Just as, in centro-linguistics, languages can be studied as working systems at a point in time (i.e., synchronically) or as systems undergoing change with the passage of time (i.e., diachronically), so the linguistic profile of a society or of an individual can be studied cross-sectionally or longitudinally.

Sociolinguistics has been, for example, particularly interested in (amongst other things) multilingualism in societies, especially in national societies—with linguistic demography, and with the changing roles of languages. A linguistic profile of a society at a given time is a synchronic study; charting changes in linguistic profiles (e.g., the rise of Standard English in Britain) is a diachronic study.

Likewise, psycholinguistics studies linguistic ability and behavior (e.g., listening comprehension in a second language, reading comprehension in the mother-tongue, or hesitation phenomena in speaking) in the individual at a given time, or it studies

change in the individual's linguistic profile in the course of time (obvious examples being language acquisition in the child, or the learning of a second language).

The framework for literacy study proposed here is arrived at by relating three time scales to the three branches of linguistics. The three time scales (or diachronic scales) are:

1. The evolutionary scale —the diachrony of the human race
2. The historical scale —the diachrony of particular societies
3. The individual scale —the diachrony of the human person

(See Roger Brown's "The Three Progressions" in *Words and Things*, Chapter VIII)

Psycholinguistics, on its diachronic axis, is obviously concerned with the linguacy of the individual—its inception and growth, its extension into literacy, its decline.

Sociolinguistics, on its diachronic axis, is concerned with the linguacy of societies—their growth and decline, and accompanying linguistic changes, including the presence or absence of literacy, and its extent, degree, and kind.

Centrolinguistics, for all its concentration on language structure, is no less concerned with linguacy, since at its most general it is based on the recognition of levels; and, on its diachronic axis, the scale with which it is concerned is the evolutionary scale, the scale on which the linguacy of Man is studied. On this scale, the biological beginnings of language are studied yielding the characteristic features of organization and the choice of speech as a medium. Also on this scale must be reckoned the change in the medial aspect of language which came about with the advent of writing—the watershed between human pre-history and human history.

John Mountford teaches in the English Department of La Sainte Union College of Education, Southampton, England. At the Reading Research Unit of London University's Institute of Education he became interested in the teaching of initial literacy. Literacy at all stages has since become his main interest, and he is at present especially concerned with "tertiary-level literacy," that is, the literacy of students in higher education. Two articles by him have appeared in *Visible Language:* "'Writing' and 'Alphabet'" in Vol. II (1968) and "Some Psycholinguistic Components of Initial Standard Literacy" in Vol. IV (1970).

Correspondence

The editors welcome comments on articles, reviews, and letters that have appeared in past numbers. Communications should be addressed to the Editor, c/o The Cleveland Museum of Art, Cleveland, OH USA 44106.

To the Editor:

I refer to the article by Aaron Marcus on Visual Syntax of Concrete Poetry in *Visible Language*, Autumn 1974. I have to confess to being a stranger in the field of concrete poetry but have a professional concern with name placement and type disposition through my work in map making. In consequence I find each issue of VL potentially important in that it may bring some parallel work which can be related to type in cartography—a rare field if ever there was one. It was with considerable interest, therefore, that I came across items such as Figure 18 in the above article. Whereas to many whose work will bring them into contact with type set in regular lines such layout may appear unusual, to me it appears surprisingly similar to type disposition in polar projections in cartography. The intermingling of various type sizes is also close to cartographic method and even the unusual association of groups of

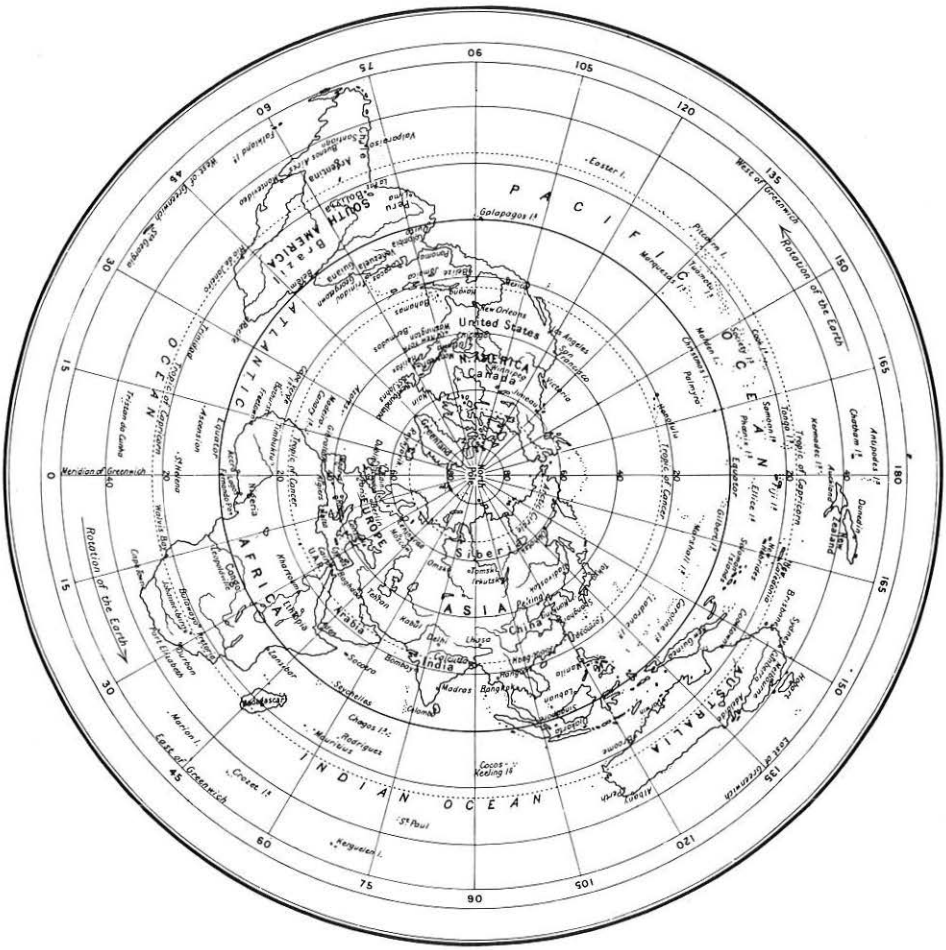
Aaron Marcus' Figure 18: Ferdinand Kriwet, "Type is Honey," 1962.

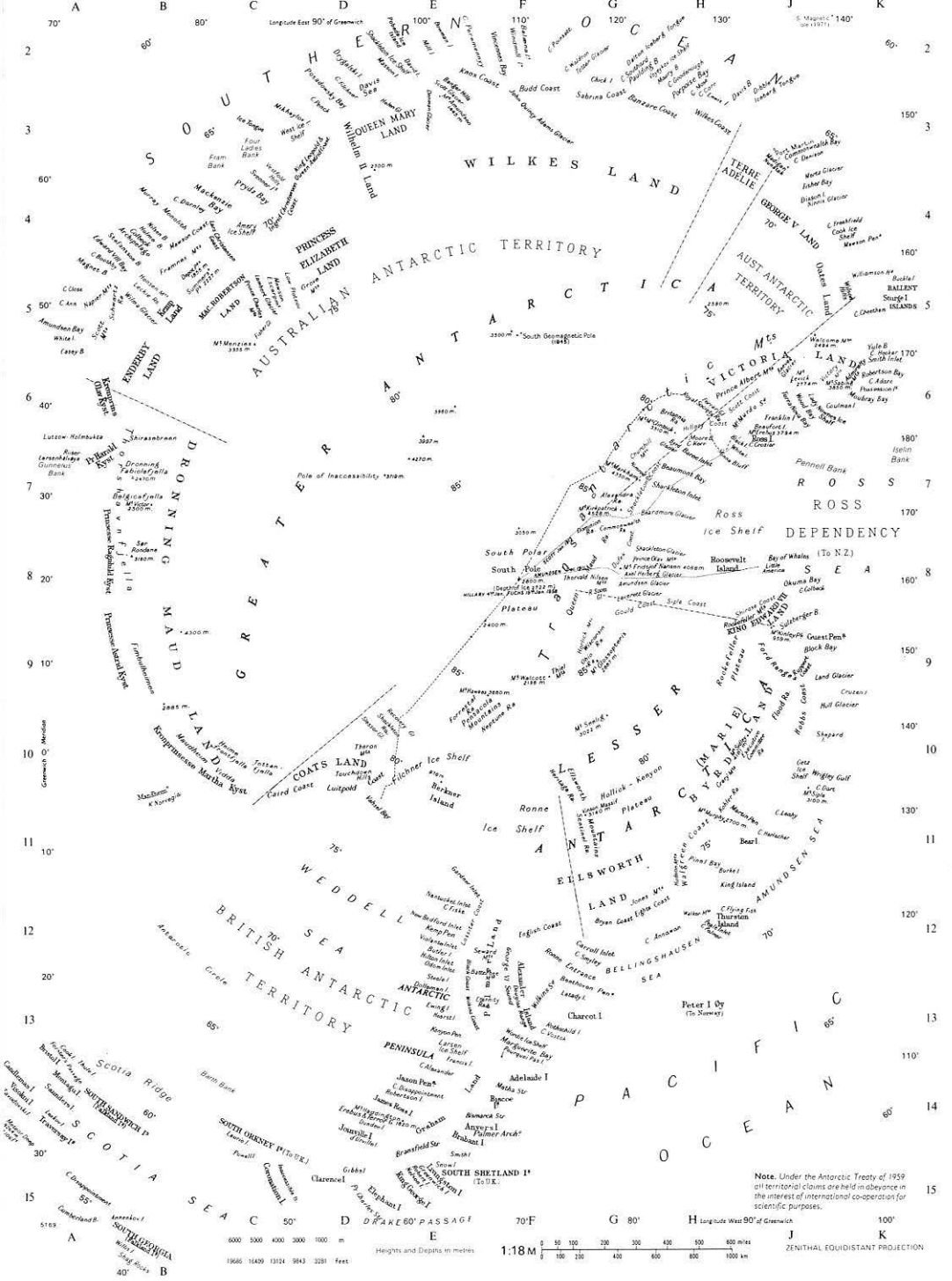
characters would leave the map maker unsurprised, as his work commonly brings him into contact with place names in foreign languages which have character groupings very different from his own.

Hitherto, I had seen the Dada artists as having strong links with cartographic type disposition, but now I must add concrete poetry (at least in certain of its visuals) to the list. You will realise from this that my knowledge of concrete poetry is merely superficial, but there is so little typographic work done which is not to do with book work that to find someone else working with type (or lettering) outwith the regular book page (and even approaching the problems one finds in map making) is very welcome. I enclose herewith some samples to try to make my point more clear.

Ian A. G. Kinniburgh, The Geographical Institute
Duncan Street, Edinburgh EH9 ITA, Scotland

From the *Bartholomew Intermediate Atlas*.





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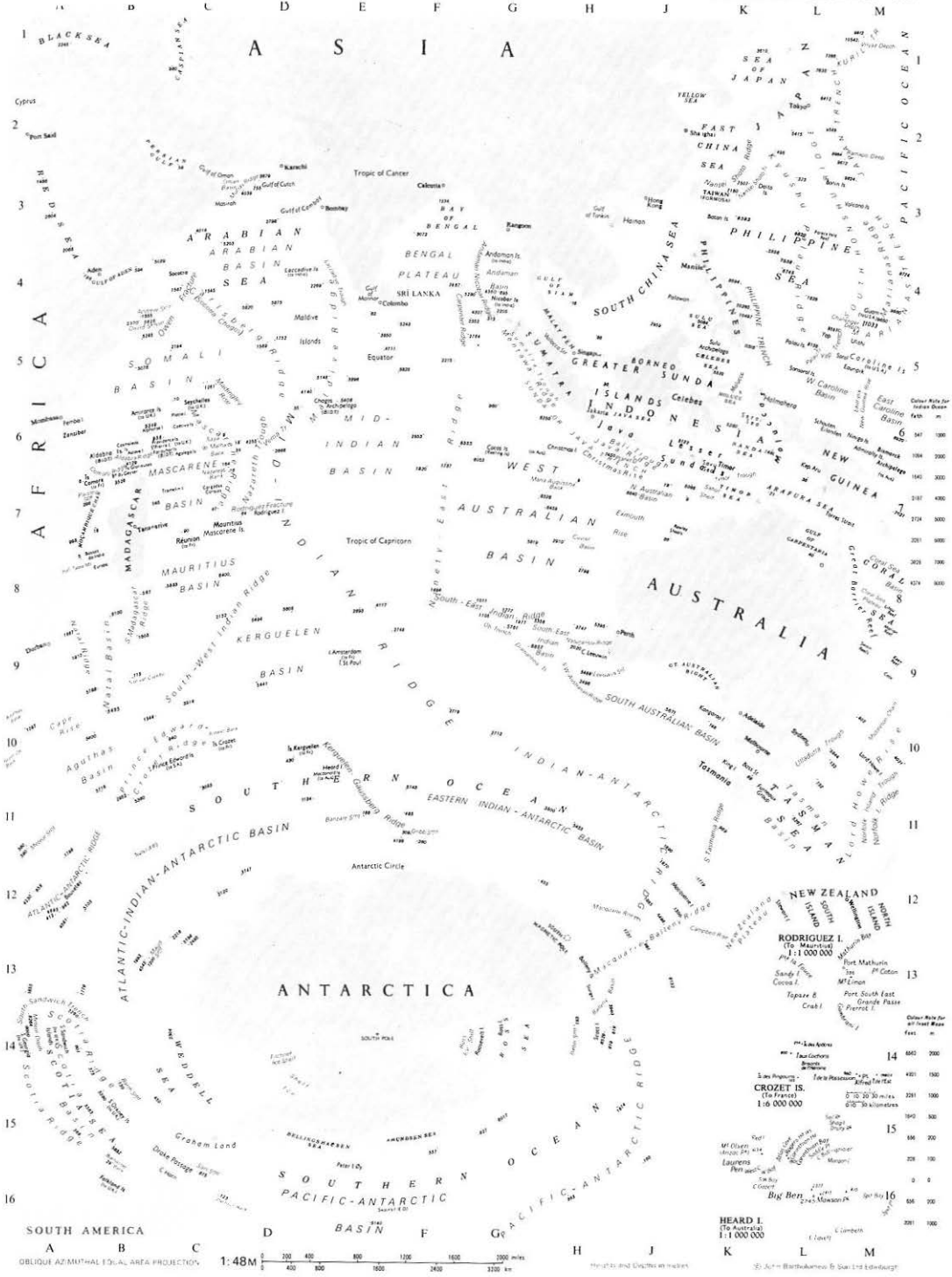

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Résumé des Articles

Traduction: Fernand Baudin

On peut lire avant de savoir parler *par Danny D. Steinberg et Miho T. Steinberg*

Il est généralement admis qu'il serait prématuré de faire lire les enfants avant l'âge de cinq ans et que l'exercice de la parole est le fondement souhaitable et indispensable pour toute pédagogie de la lecture. L'article présente les quatre phases d'une expérience qui a été entreprise avec un enfant âgé de six mois: familiarisation avec les signes de l'alphabet; identification des lettres; identification de mots, de locutions et de phrases; lecture de textes. L'enfant a réellement appris à lire avant de pouvoir parler. A trois ans et demi il lisait couramment des phrases courtes. A huit ans, il lisait comme un garçon de 16 ans. La même expérience commencée plus tard avec un mongoloïde âgé à présent de cinq ans lui permet de lire 48 mots, cinq locutions et quelques phrases. Conclusion: les idées reçues en matière d'enseignement de la lecture, et quant au rôle de la parole en cette matière, sont à revoir.

L'apprentissage de l'écriture *par Roy A. Moxley, jr.*

Pour l'auteur, l'apprentissage de l'écriture est un choix entre plusieurs alternatives. Il examine plusieurs niveaux et aspects de l'écriture débutante -y compris des écritures inversées de gauche à droite- en se plaçant à ce point de vue, précisément. Selon lui on obtiendrait des écritures plus nettes, plus expertes et plus personnelles, si l'on permettait à l'apprentissage de se faire par paliers successifs.

Un poème dans l'environnement *par Mark Mendel*

OJOS NUMEROSOS est un poème composé de vingt trois tercets. Il fut écrit pour être peint sue les pignons aveugles des buildings, sur les viaducs et autres sites urbains ordinairement couverts de graffiti. L'ordre des tercets comme la suite des vers à l'intérieur des tercets sont modifiables à volonté. Leur succession sera déterminée par la circulation en ville. Les gens liront ce poème comme ils lisent tous les jours les graffiti et la publicité. La poésie est antérieure à l'écriture et à l'imprimerie. En tant que chasse gardée d'une élite cultivée, elle n'est que le résidu de la diffusion exclusive sous la forme imprimée. Je veux que ce poème soit à sa place sur la paroi d'un viaduc comme un sonnet était à sa place sur un feuillet imprimé. Il s'agit de la diffusion profuse, simultanée et continuè d'un poème dans le paysage urbain.

L'étude des manuscripts de la Renaissance *par Paul Oscar Kristeller*

La lecture et l'étude des manuscrits donne un contact physique direct avec le passé, ce qui enrichit les sources de notre savoir, ouvre des perspectives et donne des dimensions nouvelles à nos recherches. Malheureusement les références aux manuscrits dans les publications de textes et dans les études connexes sont souvent fautives, incomplètes on périmées. Il importe d'examiner soi-même, méticuleusement, les originaux ou les reproductions. Partout où la chose est faisable, il faut scruter, lire entièrement et systématiquement tous les catalogues imprimés ainsi que les inventaires manuscrits. L'auteur évoque certaines difficultés que l'on peut rencontrer à trouver les manuscrits voulus—même dans les collections connues. Tout manuscrit est un objet de recherche exceptionnel et mérite d'être conservé précieusement, d'être catalogué et rendu facilement accessible.

Kurzfassung der Beiträge

Übersetzung: Dirk Wendt

Lesen vor dem Sprechen *von Danny D. Steinberg und Miho T. Steinberg*

Es wird allgemein angenommen, daß Kinder bis etwa zum fünften Lebensjahr nicht bereit sind, zu lesen, und daß Sprachproduktion eine notwendige und wünschenswerte Grundlage der Lehrmethodik sei. In dieser Untersuchung wurde bei einer Versuchsperson mit dem sechsten Lebensmonat begonnen, sie einem Vier-Stufen-Programm zu unterziehen: Alphabet-Vertrautheit, Alphabet-Erkennung, Wort-, Satzteil- und Satz-Erkennung und Textlesen. Das Kind erwarb bedeutende Lesefertigkeit vor dem Sprechen. Mit 3-1/2 Jahren las es kurze Sätze fließend, und mit 8 Jahren glich seine Lesegeschwindigkeit und -genauigkeit der von Elftklässlern. Einem mongoloiden Kind wurde das Programm in einem höheren Alter vorgelegt; jetzt, mit 5 Jahren, liest es 48 Wörter und 5 Teilsätze und Sätze. Es wird geschlossen, daß die meisten gegenwärtigen Vorstellungen über die Lesebereitschaft und über die Rolle der Sprachproduktion in der Lehrmethodik einer Revision bedürfen.

Zum Erwerb von Schreibfertigkeiten *von Roy A. Moxley, Jr.*

Der Erwerb von Schreibfertigkeiten wird als Reduktion von Alternativen betrachtet. Verschiedene Stufen und Aspekte des Schreibens von Anfängern, einschließlich spiegelbildlicher Umdrehungen, werden unter dem Gesichtspunkt einer Auswahl aus einer anpaßbaren Alternativenanzahl untersucht. Es wird behauptet, daß genauere, vollständigere und individualisierte Schreibfertigkeiten entstehen, wenn die Informationsverarbeitung in anpaßbaren Schritten erfolgt.

Die Anbringung von Serien-Mitteilungen —ein Gedicht in der Umwelt *von Mark Mendel*

OJOS NUMEROSOS ist ein Gedicht aus dreiundzwanzig Drei-Zeilen-Stanzen. Es wurde geschrieben, um auf die Seiten von Gebäuden, auf Viadukte und auf andere städtische Oberflächen gemalt zu werden, wo man typischerweise Graffitti findet. Die Verse stellen eine Zufallsfolge dar und sind austauschbar innerhalb des Gedichtes. Sie bilden eine Kette in der Erfahrung der Person, die sich durch die Stadt bewegt. Die Leute werden mit diesem Gedicht konfrontiert, wie üblicherweise täglich mit Graffitti oder Plakatwänden. Die Dichtkunst geht dem Schreiben und Drucken voraus. Die neuere Tradition der Dichtung als Besitz der gebildeten Elite erwuchs aus ihrer Einschränkung auf die gedruckte Seite; ich möchte dieses Gedicht dem Viadukt anpassen, so wie man einst empfand, daß das Sonnet auf die Seite paßte. Das ist das gestreute Wort—die stetige gleichzeitige Ausstrahlung eines Gedichtes in die Umwelt.

Methoden der Forschung an Renaissance-Manuskripten *von Paul Oskar Kristeller*

Die Benutzung und Untersuchung von Manuskripten bringt uns in direkten physischen Kontakt mit der Vergangenheit, wobei sowohl unser originales Quellenmaterial bereichert wird als auch neue Dimensionen und Perspektiven der Forschung eröffnet werden. Unglücklicherweise sind Manuskriptangaben in Textausgaben oder sekundären Studien oft falsch, unvollständig oder veraltet. Äußerst genaue Suche nach Einzel-Angaben aus erster Hand ist sehr wichtig, ebenso wie die direkte Durchsicht des Manuskripts oder einer Reproduktion. Wenn möglich, ist es ratsam, systematisch und vollständig alle verfügbaren gedruckten Kataloge und handgeschriebene Verzeichnisse durchzusehen oder zu lesen. Besondere Schwierigkeiten, einschlägige Manuskripte zu finden—selbst in vertrauten Sammlungen—werden besprochen. Jedes Manuskript ist eine einzigartige Forschungsquelle, die sorgfältige Konservierung, angemessene Katalogisierung und bessere Zugänglichkeit verdient.

The Authors

Danny D. Steinberg is an associate professor at the University of Hawaii where he teaches psycholinguistics. From January 1976 through December 1978 he will be on leave teaching at Hiroshima University, Department of English Language Education (Higashi-senda-machi, Hiroshima 730, Japan). Prof. Steinberg was a postdoctoral research fellow in psycholinguistics with Charles E. Osgood at the University of Illinois from 1967 to 1969. Aside from reading, his major research interests are in semantics, language and mind, and phonology.

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Roy A. Moxley, Jr., is associate professor of education in elementary and early childhood education with the College of Human Resources and Education at West Virginia University (Morgantown, WV 26506). He has been an instructor at the University of Michigan, a visiting lecturer at Eastern Michigan and McGill Universities, and an assistant professor at Indiana University Northwest. Dr. Moxley's interests include the acquisition of visible language, educational technology, and early childhood teacher education.

Mark Mendel (Back Ridge Road, East Orland, ME 04431), after studying with Karl Shapiro and Elliott Coleman, received an M.A. from Johns Hopkins University. He has just completed a pamphlet for the Maine State Commission on the Arts on his experiences as a visiting poet in Maine public schools, and is currently working in Maine on a series of rural-environmental poems which are being lettered on barns and gas stations. He has given readings/slide-showings of his work at numerous colleges. He is self employed as a mason, specializing in stone fireplaces.

Paul Oskar Kristeller (1161 Amsterdam Avenue, New York, NY 10027) is Frederick J. E. Woodbridge Professor Emeritus of Philosophy, Columbia University. He has published many articles and several books, including *Studies in Renaissance Thought and Letters* (Rome, Edizioni di Storia e Letteratura, 1956), *Renaissance Thought* (Harper & Row, 1961), and *Medieval Aspects of Renaissance Learning* (Duke University Press, 1974). Some of his books and articles have also appeared in French, German, Italian, and Spanish. Dr. Kristeller has done much research on manuscripts in European and American libraries, and especially in Italy; as a result he has published many papers—especially his *Supplementum Ficianianum* (2 vols., Florence, Olschki, 1937), his *Latin Manuscript Books before 1600* (3rd ed., Fodham University Press, 1965) and his *Iter Italicum* (vols. 1-2, Leyden, 1963-67; two more volumes in preparation).