

2.9m

A STUDY IN METHOD OF CORRECTING STUTTERING AND
STAMMERING.

A thesis submitted to the faculty
of the Graduate School of the U-
niversity of Minnesota by Flor-
ence Mayfred Briggs in partial
fulfillment of the requirements
for the degree of Master of Sci-
ence, -May twenty fifth, 1911. o

1.

A STUDY IN METHOD OF CORRECTING
STUTTERING AND STAMMERING.

The words stuttering and stammering both come from Definitions the German but the content of the terms as used in America has come to differ from the original German meaning. By stammering the German writers have expressed a patient's difficulty in the pronunciation of a sound, or combination of sounds, and the consequent "substitution of incorrect sounds for correct ones." Stuttering, on the other hand, designates any "spasmodic interference of speech due to contraction of speech muscles." (Gutzmann). In this country the German use of the term stammering has been dropped and the word applied to the difficulties experienced by a person whom the Germans would call a stutterer. This stammering has been defined as "a more or less constant inability to speak freely owing to an incoordinate and spasmodic action of the respiratory, phonatory or articulatory muscles." (G. Hudson-Makuen). The term stuttering is not so frequently used by English-writing auth-

SEP 15 1911 6. 72

106128

2.
ors, and, when found, designates an initial, or milder, case of stammering. As the characteristics of this initial condition seem sufficiently constant to stand as a basis for classification, the term stuttering might be restricted to the speech difficulty of the class of individuals who rapidly repeat a syllable several times before the word can be completed, -(st-t-t-t-uttering.) Stammering, then, could express the second type, often developed from the first-i.e.-that type wherein a measurable period of time elapses in which no sound is uttered, or in which there is an unbroken prolongation of a sound before the next syllable can be articulated, -(sta-----mmering). It is in this sense that the terms are used in this paper.

The difficulty experienced by so many children in correct pronunciation has led to considerable investigation (Paul - Vierowdt - Wundt - Sully - Oltuszewski - Ament- and others), and to the formation by Schultze of the following law:- "For every sound, vowel or consonant, that the child cannot produce it substitutes the one nearest related and produced with less physiological difficulty,

Literature
Stammering-
(German use)

3.

"and if it has not mastered the latter, it omits it altogether." He then divides the sounds into three categories in the order of the ease with which they can be pronounced: (1)labials-(p,b,m,etc.) (2)-linguals-(t,d,n,s,etc.)-(3)-gutterals-(k,g,ng,r,etc.). This agrees, in the main, with the order of speech development, as observed by Schultze, so that it would be natural for the child, in attempting a new sound to substitute a similar one that was more familiar and could be more easily articulated. Though other investigators (Gutzmann-Oltuszewski-Preyer) do not agree with Schultze concerning the exact order of the development of sounds or sound combinations, the theory of the substitution of the easier for the more difficult still stands, and the exact order of the development of sounds is considered to be largely influenced by individual variation (Gutzmann - Preyer).

Other causes for mispronunciation may be summed up under the head of "physical defects." Cleft palate, hair-lip, deafness to greater or less degree, abnormal organs of speech, misplaced teeth and similar defects all serve

4.
as causes for defective speech. Nervous troubles also have great influence. Oltuszewski gives "weakness of the auditory centre or lack of practise of the articulatory organs" as causes for stammering. Inattention, or the careless pronunciation of adults, and therefore incorrect imitation also results in the mispronunciation by the child. Lack of discrimination of sounds, or sound combinations, or lack of discrimination of the order of the sounds causes faulty speech (Sully). An interesting theory concerning the reason for the frequent stumbling over the letter "s" has been advanced by Treitel who says that "s" has the highest pitch of any letter and is therefore hard to hear distinctly. He substantiates this with the evidence given by people with bad hearing who say that "s" is the first letter with which they have difficulty when talking over the telephone. On the other hand, Rzesnitzek holds that "s" is difficult to master because of the lack of definite motor or pressure sensations in its pronunciation, and therefore leaves no clear motor-speech memory. The same might be true of other sounds, and the correction of all

5.
the articulation which is faulty depends upon each individual's peculiarities and experience.

Stuttering and the methods for its correction have been more carefully worked out in Europe. Though there seems to be no unanimity of method reported, each worker developing his own scheme, in general two main types of training seem to predominate. These result from two opposed views as to the cause of stuttering. ¶ Gutzmann and Coën speak of the cause as "purely physical". "Incoordination of the breathing and speech movements", Gutzmann gives as the cause of stuttering. Three sets of muscles, (1)-the expiratory (2)-the vocalizing and (3)-the articulatory, with which the nerves must cooperate, form the speech mechanism and stuttering is brought about by some defect in its parts. This may be due to diseases of the nose and throat as cases of temporary stuttering have been known to result from closing of the nasal passages. Imitation, he claims, is frequently the cause of the hesitating, spasmodic speech, but there is usually an inherited weakness which permits the tendency to gain an easy foothold.

Stuttering-
(German and
English use)
Causes

6.

Coen agrees with Gutzmann, saying that the respiratory and vocal organs need regulation and that the accompanying jerky movements so often a part of the stuturer's difficulty, are purely involuntary,--that whatever psychical phenomena there may be present are results and not causes of the speechdefect.

Ssikorski may also be said to belong to this group, as he emphasizes the so called physical derangements as the cause of stuttering. He says that this form of speech defect is caused by a "disturbance of the nervous mechanism" and though he calls this "purely physical" he adds that fright too, is often an immediate cause.

Directly opposed to these men is Denhard who speaks of "stuttering" as "the inability under certain abnormal psychical conditions to utter speech sounds" correctly, "even though the word-picture is clearly and plainly before the mental eye of the stuturer." He considers the difficulty a "fancied difficulty", the cause a fear that the sound desired cannot be uttered with the result that the "incoordinated movements" spoken of before, are mere

7.
voluntary attempts to aid in starting the flow of speech. He feels that the causes are psychical and that the accompanying physical manifestations are results of the psychical disturbance.

To this last statement Liebmann agrees, though he also says that a weakness of the vocal centres and general nervous condition, often inherited, leads to defective speech. He emphasizes the over exaggeration of consonant elements as a cause of stuttering, and adds that fright and embarrassment increase the difficulty. Although not so extreme as Denhard he seems to agree with his attitude and training as opposed to that of Gutzmann.

The theory advanced by Gruenbaum contains elements of both the preceding views. He believes "stuttering and functional speechlessness to be but different degrees of the same trouble" due to "paralysis of the speech centres." The accompanying psychical phenomena he classes as results thereby agreeing with Gutzmann, whereas, on the other hand, he speaks ~~of~~ the movements as voluntary.

Chervin keeps aloof from theories concerning the

8.
cause of stuttering, but his course of training places him with Treitel, Heymann, Oltuszewski, Kussmaul, as a member of the Gutzmann "school". ¶ Among the English writing authorities are Wyllie, Bell and Hudson-Makuen. Wyllie claims stammering(stuttering) to be the result of "lack of coordination of the action (or delayed action)of the larynx which produces vocal speech and the oral mechanism which modifies the sounds of the larynx in tone and timbre". Bell and Makuen agree in the main with Wyllie and find the root of the faulty speech in a lack of power to rightly control the respiratory, phonatory and articulatory muscles. The general physical condition and mental attitude also greatly influence the condition of their speech control.

Turning to the methods for correction used by these **Methods** men we find a variation corresponding to their varied theories concerning the cause of spasmodic hesitation in speech. The greater part of Gutzmann's training consists of breathing, vocal and articulatory drills, gymnasium work for the development of motor centres (this last he believes carries over to the speech motor centres), and later, simple read-

9.
ing lessons. He begins with a whispered "h", then adds the vowels to this sound which is practised with what is called "fractional exhalation"-i.e.-(1)-inhalation (2)-exhalation broken at regular intervals(I - - - -).

Words beginning with "a" are first used, and these are followed by words having other vowels for the initial letter, and finally by words beginning with consonants and containing various sound combinations. He uses a mirror by means of which the pupil or patient is enabled to see and work out the proper position of the speech organs for any particular sound. After these sounds are learned simple conversation, questions and answers, and practise in expression is given. Poetry and prose is read until fluency is obtained. Provided all this work is thoroughly done Gutzmann contends that no attention need be paid to the psychical phenomena as they will care for themselves. He does give, however, a list of twelve rules for each person to follow, and in these rules may be found much that might be called psychical training.

1. Speak slowly and calmly.

10.

2. Always be sure that you know what you wish to say and how you want to say it.

3. Do not speak too loud nor in too low a tone.

4. Stand or sit straight and still while you speak.

5. Take a short, deep breath before speaking a sentence.

6. Be sparing with your breath; hold it back rather than urge it forward.

7. Give prominence to the vocal position.

8. Focus the expiring air not on the consonants but on the vowels.

9. Do not use stress in the formation of sound.

10. Begin the vowel with a soft and somewhat deep tone.

11. Extend the first vowel in a sentence and combine all words as though the whole sentence were but one word.

12. Always speak plainly with a pure and melodious voice.

The treatment given by Coën and Ssikorski is along much the same lines. They use breathing, vocal and articu-

11.
latory exercises, and pass from a mastery of the elements of speech to the more difficult combinations. Coën uses the long drawn out vowels, and carries out his word drill in this order:

a. vowels-umlautes-diphthongs

b. consonants-labials- labio-dentals - sibilants - labio-sibilants - gutturals.

Ssikorski starts by teaching his pupils to open and close the glottis. Then the "a" sound is added and the drill with (1)-simple(I——) (2)-fractional(I - - - -)and (3)-compound(1 and 2 alternated) breathing is practised. He places much emphasis on the muscular sensations involved and requires his pupils to attend to these and repeat them "in mind". Both he and Coën then proceed with reading and conversation exercises. An outline of the work follows:

1. repeating after the teacher.
2. reading.
3. reproducing mentally what has been read, as an innervation exercise.
4. reciting what one has committed to memory.

12.

5. talking in a whisper.

6. talking aloud.

7. exercise in modulating the voice while speaking or declaiming.

8. the patient tells orally what he has read, or retells what he has told before.

9. conversation.

Gruenbaum varies his treatment by laying stress on "change in tempo". He believes this ~~will~~ strengthen the will, and through the will, the control. He also is exceptional in his advocacy of hypnotism as a means of cure for speech defect. ¶ The treatment of Chervin differs but slightly, the only noticeable variation being in his requirement of absolute silence except for the exercises during the first week.

Of the methods of training given by those who consider the root of the difficulty to be psychical, very little of an exact nature can be said. Liebmann says that the treatment must be entirely personal, varying with each individual. He uses no exercises of any kind, as he

13.

considers them harmful. After as careful a diagnosis as is possible to make from hearing the child talk, he starts out with some simple conversation about a well known object or common activity in the child's life. He takes great care to have the child clearly understand him and repeat the words correctly, for he believes the "tone-picture", or auditory image, to be the fundamental element of vocal speech. He also sings or reads with his pupils, using the extended vowel, which, he claims, "procures fluency at once" and does away with fear and embarrassment. Self confidence is gained through much encouragement on the part of the instructor. He never says, "Dont do that!" but rather, "Good! Now try it this way." When a sufficient number of "tone-pictures" have been correctly implanted in the child's mind, sentences with perfectly understood content are used, and finally, fluent conversation is obtained through the reading and telling of stories.

Denhard has an even less inflexible method. "Gentle persuasion" and repetition seem to be the basis of his training. The child's self confidence must first be

14.

gained as it is most important. This, as with Liebmann, is gained through encouragement and assurances of success, The child is urged to speak again and again and the words repeated, imitated, carefully until correct speech is obtained. Denhard reports great success with his method and, though he works five hours a day, his average length of time for training is only sixteen days,- as opposed to the six months used by Gutzmann.

Makuen, Wyllie and Bell all use a "physiologic alphabet" as the basis of their work. Just as there is a written alphabet made up of letter units, so these men have built up a spoken alphabet made up of speech units. According to Makuen, it "constitutes a basis for phonatory and articulatory treatment of stammering, and of all other forms of defective speech." The individuals are taught to speak as they are taught to read. They learn "exactly how to produce and articulate" and how to recognize the sounds when correctly spoken. The ear is trained as well as the musculature of speech. This involves a mental as well as a physical feature in the training. Thus the "alphabet

15.
 serves as a mental and physical discipline and teaches the
 art of orderly thinking as well as that of orderly speak-
 ing."

MAKUEN'S PHYSIOLOGIC ALPHABET

Vowels

e	a	ah	au	o	oo
even	apes	are	awed	over	oozing

Consonants

	<u>voiceless</u> <u>oral</u>	<u>voiced</u> <u>oral</u>	<u>voiced</u> <u>nasal</u>	
Labial	p wh	b w	m	} Paul Brown made } white wax
Labio- dentals	f	v		full voice
Linguo- dentals	th'	th"		think thou
Anterior linguo- palatals	s sh t	z zh d l r	n	} Some zealous } sheep leisurely } took down } large rails
Posterior linguo- palatals	k h	g y	ng	} Can girls bring } home yeast?

Makuen also has his patients ignore the meaning of their
 words and speak syllabically—each syllable having as much

16.

weight as the preceding one. Prescribed exercises for this practise are given and the patient required to refrain from all ordinary conversation for several weeks while in practise. Following this, phonetic reading is given as an exercise until proficiency is obtained. Respiratory training is given, and the attention called to the proper use of the voice when the stammerer attempts to speak entirely with the articulatory mechanism. Thus "mental culture, voice culture and speech culture" form the basis of Makuen's method. Before this method can be put into practise, however, the patient must be in good physical and mental condition. "If he has become neurasthenic or psychasthenic he must be cured of these diseases before he can possibly be cured of his speech malady." Fixed ideas and obsessions must be done away with, lack of attention or ability to concentrate corrected, and weak will power strengthened before further specific speech training can be given. The patient "must learn to control himself before he can hope to control his speech", -and above all else he must have a great determination to better his condition

17.

and not only be willing to work for it but to enthusiastically carry out the suggestions made by his physician and his instructor.

Wyllie's work follows much the same outline. He first tells his patient that his larynx is at fault and that he must pay no attention to his mouth, but to his voice, and insists that "no mouth action must be allowed to interfere with the flow of throat sound." He gives special voice training for the difficult sounds. Both men use a "physiologic alphabet" as the key to pronunciation, and oral reading gives the necessary exercise.

One more similar method might be quoted from S. W. Scripture whose work is described as being "a psychologic and phonetic method for curing stuttering. Control must be restored to each set of vocal organs. Breathing exercises first teach control of the diaphragm and thoracic muscles. Control of the larynx is then taught and of the tongue and lips in articulation. The patient is next taught the letters phonetically, and educated to produce any one of them at will. Finally reading becomes automa-

18.

tic. For conversation the patient must first learn to seize hold of the thought he wishes to express and not to lose it on account of his embarrassment. He describes objects slowly and finally reaches perfect conversation."

This brief summary shows in general the trend of the best work that is being done for the correction of stuttering and stammering. That such work is in demand is made apparent by the many private institutions for the cure of this defect, which flourish throughout the country. So insistent has become the demand that efforts are being made in several cities to make some such training a regular part of the systems of public instruction. New York, Chicago, Cleveland, Denver and Minneapolis are among those working along this line. Attention was called to this need by the fact that a noticeable group of children throughout the grades and high school were being decidedly hampered in their school work by speech defects of various sorts. In St. Paul this winter, two hundred and thirty two such children were found in the grades, while in Minn-

Present
condition

19.

capolis the number was something over two hundred and fifty, making about one child in a hundred. School census reports from other cities-Pittsburg, for example-agree with this record, showing that one percent of the children are troubled with speech defects. Other causes for retardation among grade children have received attention and with the growth of this department of educational work, training for the correction of speech defect must surely find its place.

E.L. Kenyon has said: "The public school has already taken up the deaf and blind and the slightly mentally defective child. It has now only to enlarge its scope a trifle and take children having defects of speech whose cure depends upon a certain training which in a measure is allied in character to the regular work of the school." He asks what would result from special classes for correction of stammering in the public schools and answers his question in this way: "The child would go to that school at the very inception of the disorder. He could be taken to school at any age at which the first indications of

20.

stammering appeared. The result would be that the development of a fixed habit could in a large number of cases be checked, and kept under control indefinitely to prevent relapse."

If such training is to become a part of the regular school work how is it to be accomplished, -what method used? Are special classes and special schools with trained specialists-both physicians and instructors-necessary?

In the methods already in use there seems to be involved much time and labor, long hours of mechanical drill, and the services of specialists. The difficulty in getting trained teachers to do this, and the amount of time involved, make it seem impractical for grade school work. It was noted, however, that the methods calling for the greatest expenditure of time and labor were those that called for much special exercise and mechanical drill of the peripheral organs, -whereas Liebmann and Denhard, who did away with this drill, spent much less time in gaining favorable results by means of working with the psychical elements involved. Even Gutzmann and Makuen, who stand

21.

as representatives of those who make the physical training take the place of first importance, insist upon combining with this a "mental culture." D. Braden Kyle says that though malformations or pathological conditions will predispose to defects of speech, the mechanical part would not be the entire cause of the defective speech. "It is merely an associated condition, the habit is certainly a mental one." If this is true, and if the work of Liebmann and Denhard is any criterion, would it not be possible to develop a method that would clear up this "central" trouble, and save time by doing away, to a large extent, with the mechanical drill of the peripheral speech mechanism? Also could this be made simple enough to be practical in the regular school room, under the supervision of the regular teacher? A suggestion for such a method came as the result of an experiment.

Special
problem

A number of stuttering and stammering children (seventeen) were examined and though there were individual differences, this may be taken as a typical case having the common characteristics of the group. A child who

Preliminary
experiment

22.

stammered badly was asked to read some familiar prose or poetry for one minute and the number of his hesitations recorded. Then he was asked to look at and describe some interesting picture, giving full details, for one minute, his record again being taken. The results were striking. During the period of reading the hesitations were numerous and very marked, but during the time he spent describing a picture full of interest for him he stumbled but few times, not noticeably more than a person with normal speech control. What interpretation could be given these results? Very evidently the peripheral organs were not defective for under certain conditions there was perfect, normal speech. The desire to do well was not absent for the child was trying hard when he read. The control was lacking to follow volition at one time and not at another; would that not be concerned with a central process and not be a matter of the peripheral mechanism, but rather one of the "engineer"? Repeated trials brought similar results, the effort an apparent strain when reading, and resulting in comparative fluency when merely describing the picture. The

23.

images in the picture must be easier in some way, to get into verbal form than the printed words. On the supposition that it might prove easier for him, he was asked to tell, in his own words, the story of the verse he had been reading. At once he became dismayed and said, "I dont know." "You dont know what you read?" "No." He was instructed to read it again to himself and tell it. When he thought he was ready, he began with great effort and tried to repeat, word for word, the verse as if memorized. When stopped and told again to tell it as a story in his own words, he again failed. Apparently the words had little meaning for him, little content. He knew only so many meaningless words that, try as he would, he could not pronounce at will. It seemed a vague, senseless mass to him, and his attention was directed solely toward making something over into sounds. There seemed nothing for him to talk about-to tell to another. When asked to describe the picture from memory he answered quickly and steadily, though not so readily, perhaps. It was not a stammer but a hesitancy due to an effort to remember. As soon as he

24.

knew what he wanted to say, he showed no great difficulty in articulation at will. His attention was not directed toward the words-the sounds-but toward the idea which he wished to convey.

Such was the common experience of the group with which I worked. Though no two were just alike in other details, they seemed unanimous in this one characteristic. With their minds really clear, and their attention on the idea which they wished to communicate, and not on the speech organs, the difficulty in articulation was very materially lessened.

This suggested a method that was tried out on a group of twelve grade children from the St. Paul schools. An effort was made to get as random a group as possible, and any child was eligible who had "sufficient difficulty with his speech to prove detrimental to his school work." Training was given every afternoon for an hour and a half during a period of six weeks. The morning session of regular work was not interfered with and the children were under no restraint except for the hour of work in the af-

Method

25.

ternoon. This hour was made as pleasant for them as possible, and the strong desire to improve was coupled with as great a feeling of confidence in success as could be developed.

Each child was given a private examination and the records kept under the following heads:-

1. Name, age, grade, personal history, physical condition, length of time since defect was first noticed, and anything that might have added to the difficulty.

2. Each child was tested on every sound in the English language so that special individual drill might be given any one who had difficulty with particular sounds or sound combinations. The list of words used for this sound test follows:

ā - ape, ale, make, fate, game, late

ǎ - add, sack, man, can, chant, land

â - air, pair, bear, share, lair

â - arm, far, father, palm, guard

â - ask, grass, dance, branch

a - all, haul, talk, maul, crawl

"

26.

ą - wand, what

ē - eve, mete, greet, leech

ē̇ - end, met, check

ê - ere, where, there

e - eight, prey

ẽ - ermine, verge, merge

ī - ice, fine, like

ĩ - ill, pin, chick

ï - pique, police

ĩ̇ - irksome, thirst

ō̇ - obey, old, note, loaf, depose

ō̇̇ - odd, not, torrid

ô - other, son

ô̇ - do, move

ô̇̇ - woman

ô̇̇̇ - order, torn

ōō - moon, choose

ōō̇ - wool

ū - use, tube, lute

ũ - us, tub, but, study

u - rude, tumor

u - put, bull

û - urge, burn, concur

27.

3. One minute's reading of familiar prose.
4. One minute's reading of familiar poetry.
5. One minute's reading of unfamiliar prose.
6. One minute's reading of unfamiliar poetry.
7. Ten simple questions were asked, five so simple

that the child answered almost spontaneously, and five requiring the making of a simple judgment. These are typical questions:

- a. What school do you attend?
- b. What grade are you in ?
- c. Where do you live?
-
- a. What kind of weather is it?
- b. (~~Who is our president?~~) Where are you going after school?
- c. What is your favorite game?

8. One minute's description of a picture.

This was unnecessarily long, for there was very little variation in the effect of the four kinds of reading material, or two sets of questions, but was given in the hope of being able to work out some scheme of accurate diagnosis. The table, in full, is given.

28.

Because of the variation in the ages (nine to sixteen) and grades (third to eighth), the training was largely individual, but not entirely so, and in all cases it followed the same outline. It was divided into three parts with three corresponding rules, which the children soon learned to follow and fall back upon in time of need.

1. Never speak until you are sure of what you want to let another know.

2. So that you may be understood, speak slowly .

3. To help you do this, stand erect and be sure you have plenty of breath.

In all cases the purpose behind the action was emphasized, and not the means of attaining it. Primarily attention was directed toward the end and secondarily, if at all, toward the means. The second and third rules might be called the parts from which a mechanism is made, but the first rule is one governing the completed instrument in action.

None of the children had any difficulty in singing. They realized this, and said themselves that it was be-

29.

cause it seemed slower and more measured. Hence they began by reading a little simple poetry, first finding out the story and telling it. Beginning with the first day no child was allowed to read or repeat anything he did not understand, if it meant his reading but a line at a time, or less. At first the reading was done in concert, slowly, and with long pauses for breathing and to emphasize the unity of each phrase and the meaning back of it. Then each child brought into class each day a short verse or story which he recited or told, thereby holding his interest and the interest of the class, and affording grounds for the friendly criticism among the boys and girls that was most helpful and most gratefully and good naturedly taken. Each child also read a little, receiving careful individual help, but always with the same principle in mind. A clear conception of the meaning,--the idea back of the mechanical words--received the attention, the enunciation being criticized only for points that interfered with another's understanding.

New stories were also read to them--myths and legends

30.

and nature stories best holding the attention of so varied a class- as long a part at a time as they could grasp to retell. The length was gradually increased until the entire story was read and retold, complexity being gained thereby and also by the free discussions with questions and answers, which were carried on after reading. Some of the older ones recited their history lessons, and so forth, to help them gain confidence for their regular classroom work.

Besides this work, to break the periods of reading and reciting, simple physical exercises were given. The exercises were adapted from Sargent's "Health, Strength and Power", and each represented some specific activity, as swimming, paddling, archery, etc. They were given to develop capacity and general alertness and poise,- but even here less attention was consciously directed toward that, than toward such a performance of the exercise as would make it possible to swim, paddle, or shoot with a bow and arrow. In other words, they had a purpose outside of themselves for every act they performed. Records of

9

I

II

III

IV

V

VI

Weeks

160

155

150

145

140

135

130

125

120

115

110

105

100

95

90

85

80

75

70

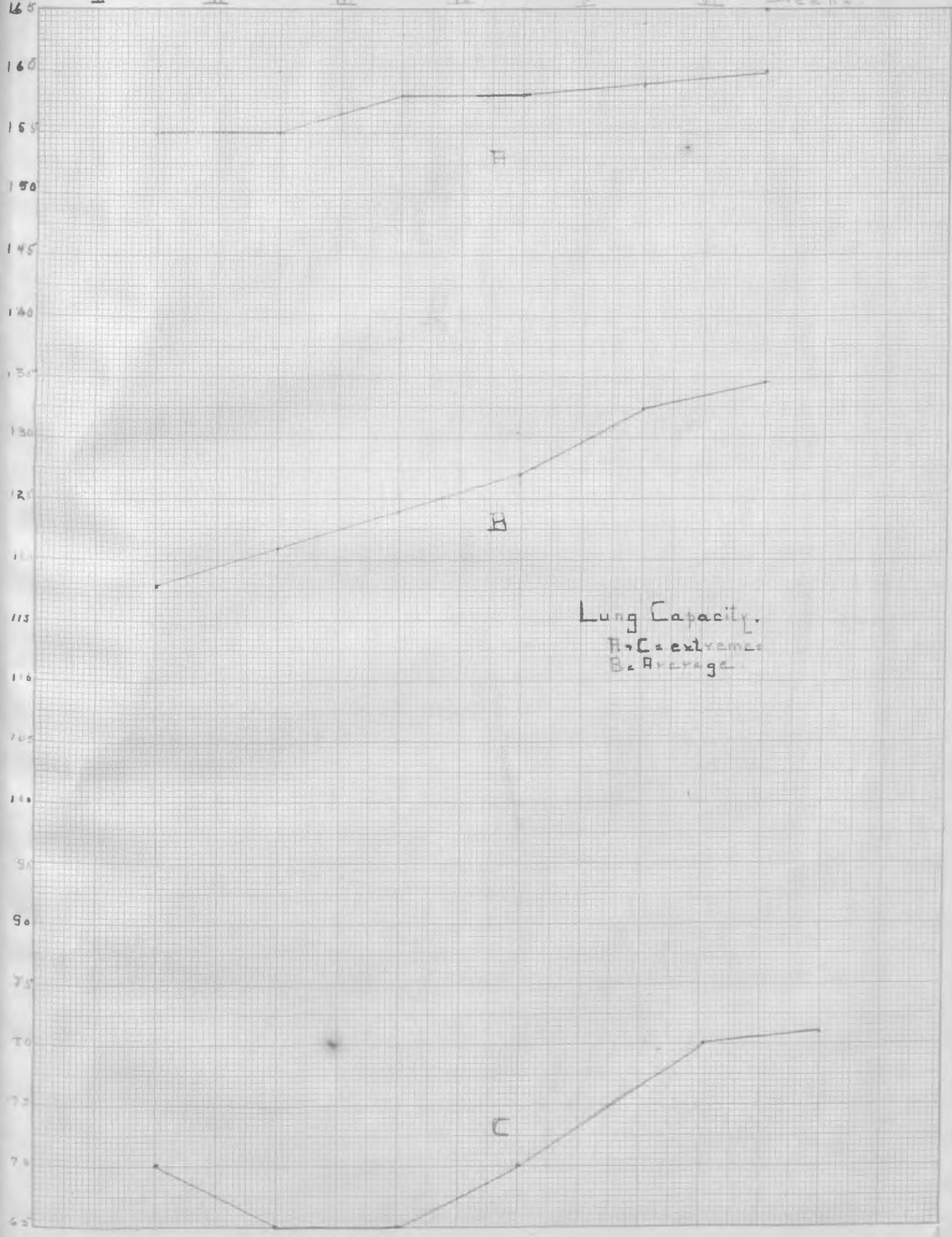
65

A

B

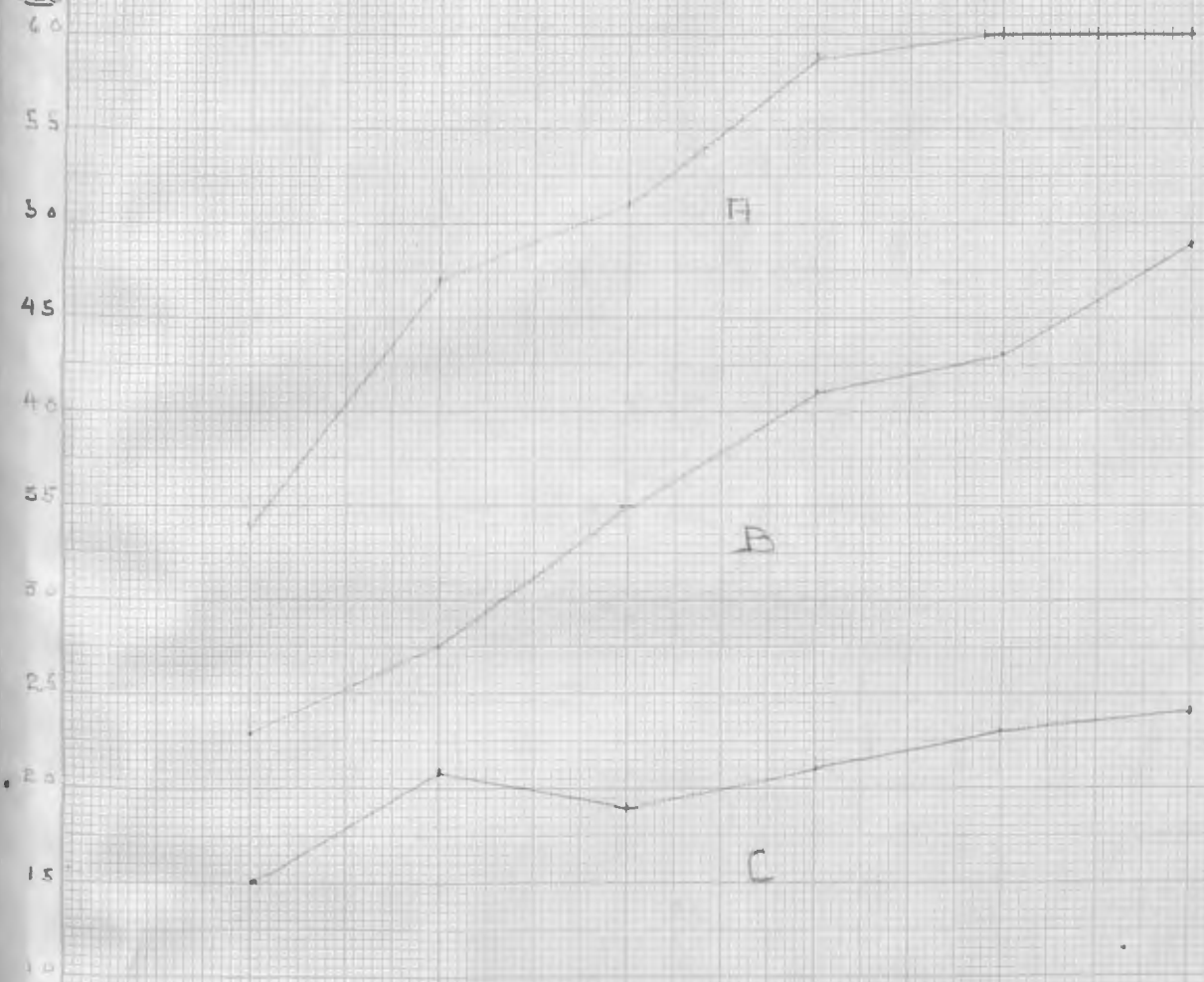
C

Lung Capacity.
A, C = extremes
B = Average



I II III IV V VI Weeks

Sec



Breath Control. (diaphragm control)
B = average.
A & C = extremes.

31.

lung capacity were taken each week, which showed a constant and steady improvement.

Simple breathing and vocal exercises were also given to aid in diaphragm control, probably the most important feature on the physical side of their speech development. Weekly records were taken for the purpose of comparison with the development of lung capacity and speech improvement. These exercises consisted in:-

1. After a deep inhalation a full and prolonged a---h was uttered with the mouth wide open. This was held as long as possible on the single breath, sometimes being loud and strong, and again the faintest sound possible.

2. A broken ah-ah-ah-ah-ah at second or half second intervals, again held as long as possible on the single breath. The syllable "ah" was used as it gave the greatest relaxation of muscles, with the fullest sound.

3. One other exercise was given occasionally as a variation, and to familiarize the children with other sounds that could be used as well. This was $\overset{\cdot}{a}-\bar{e}-\bar{a}-\bar{o}-\bar{o}$, the last syllable again being held.

32.

The length of time the sound could be held on one breath was taken as a measure of control; and this, like the lung capacity, improved steadily.

Such was the general method employed. The individual Discussion adjustments necessary were as many as there were pupils in the class, but they all followed the same general plan. One case was found whose entire difficulty resulted from a misplaced tooth; she was dismissed, as no training was necessary after the tooth was drawn. Another case ("T") could not enunciate clearly t-d-s-sh-c-ch and g, because of badly formed teeth. She was given special phonetic and articulatory drill out of class, and overcame her difficulty. Two of the worst cases were largely due to severe heart trouble ("H" and "I"), and another to a form of chronic asthma, and adenoids. These were subjects for a physician's care, and were given medical examination. The nervousness, so often an accompaniment of speech hesitancy, was found in all the cases to a greater or less degree. Some of the others ("L", "B", "H", and "E") had peculiarities due to environment and the language (Italian and Arabic)

33.

which they heard at home. However, as far as their stuttering and stammering was concerned, they all seemed to have much the same difficulty, and to profit by the same training.

In looking at the chart it will be noticed that a record of each examination is tabulated by itself,- each hesitancy being marked by a vertical line. The numerical exponent represents the number of seconds that elapsed before the following syllable could be uttered. If the vertical line has no exponent, it represents a hesitancy so short that it was not measurable.

Using the terms as defined at the beginning of the paper, the stutterer can at once be identified by the large number of vertical marks with no exponents, whereas the stammerer may have a smaller number of marks to his credit, but his difficulty be even greater, as indicated by the power of the exponents. The exponent "r" represents a stuttering repetition of an entire syllable or word, a marked characteristic of some stutterers; "m" indicates merely a mistake, significant only as it indicates careless-

34.

ness or general inaccuracy. The large "R" also indicates a repetition, but one that was allowed for the sake of getting clarity of thought, and consequent clarity of speech. If the pupil found himself lost in the middle of a phrase, he was permitted to go back and repeat, so that he could give the entire thought as a unit. This was frequently indulged in during the first weeks of the course, when it was an unusual effort for the children to read or speak with the idea well understood before it was articulated. Later such repetitions grew less frequent, but in some cases, were still in evidence at the end of the course.

It will be noted from the table that there was very little variation in the amount of hesitation recorded in all four types of reading, i.e.-familiar or unfamiliar poetry or prose. This would indicate that but one reading was necessary in the examination, or but one type or reading material need be used. Also, the two sets of questions, one calling for very simple memory answers, and the other calling for simple judgments in the reply, were found to follow no general tendency one way or another, so

35.

so that one set might better be omitted.

That the more difficult cases were cases of stammering is plainly shown, though the degree of their difficulty often made the children realize more forcefully the value of normal speech. This resulted in greater effort on their part, and often greater gain. Though their records might not be as clear as those of some of the milder cases of stuttering, they stood much higher when graded on the basis of amount accomplished. This element of self initiative was again brought out in "B's" case. He was not able to enter the class for the first three weeks, so that he was badly handicapped. Nevertheless he tried hard and accomplished an astonishing amount during the last half of the course. At the end of the three weeks his teacher could report "no perceptable change" but the boy had learned what to do and knew what he could do, and kept at it so that at the end of three months, his teacher reported that he did not stutter at all in recitation or conversation, and only occasionally when reading.

This points to another phase of this training, that

36.

is, if a pupil does grasp the method of obtaining clear speech through clear attentive thought, he will continue to gain long after special training is necessary,-for all his work will serve as constant practise for his speech defect. The second reports of the teachers would seem to verify this, for of the nine who showed improvement at the end of the course, eight were still gaining or had reached a normal condition , and none had lapsed.

The concentration of attention on the thought which they wished to communicate, rather than on their speech organs, seemed to do away to a great extent with the emotional factor of fear so often encountered. If their attention were not directed to the mechanical production of their words, the cause for the fear was obliterated. When a pupil was noticed to become nervous and strained the question "What was it you wanted to tell me?" often brought relief,- the answer following easily and at once. The attention, turned from the sounds to the idea, relieved the tension- the fear that the pupil could not utter his words- and the result was clear speech.

37.

At the end of the six weeks training, a second examination, a careful parallel of the first was given under as nearly identical conditions as possible. A stranger presided over the examination in a strange room, and the children seemed even more nervous and excited than at their original trial. The results in every case showed some improvement, and in the majority of cases a very marked improvement. They were all thought to be in a convalescent condition but of the twelve I would make two groups, putting eight in the first and four in the second group, on the basis of amount accomplished. This also corresponds with the teacher's grading, which reported all but three improved when they left the class, and three months later none were reported as having relapsed, eight of the twelve still either gaining or cured,- with the other four about the same.

Final
results

In Minneapolis schools, where work on speech defects has been carried on by Mr. Duke on a larger scale, the teachers reported but three unchanged, while all degrees of improvement were shown in a class of about thirty.

38.

Though the various teacher's records were somewhat contradictory, showing the effect of personality on the stutterer, the great majority of students were considered improved, and later reports showed that much of the improvement was permanent, though some had fallen back and needed further training.

With these results at hand it seems not impossible nor Conclusion improbable that this work will find a permanent position in our public school systems. The experimental method here discussed is only a forerunner of the work that will be done; but if these results are any indication of what can be accomplished, it would seem that a practical method of dealing with this problem is not so far away. No part of the training given to this group of boys and girls needed a specialist. There was no part of it that could not be included in every day class room work, and some practise could be given in any recitation without expenditure of either extra time or labor. It would not be training that would ^{not} usurp the time of the many for the few. Any child would profit by the practise of the simple rules followed

39.

during the short period that the special class was in session, and it would be of immeasurable value to the few abnormal ones. Whether or not further analysis would be necessary for more severe cases it does not determine, but it would prevent many from becoming stammerers and necessitating further training.

The limitations of the experiment are plain to be seen. The group was small and there was no chance for checking over the results by a second or third trial. Neither has it been possible to duplicate the group and try other methods to show the relative merits of this and other types of training. The field for the study of method along this line seems most promising, and the results so far obtained most suggestive.

As an attempt to formulate a method of accurate diagnosis, it needs further refinement to bring out more clearly the individual differences,--but the examination did afford a means of general classification, and was in the nature of a preliminary skirmish in a field where but little has heretofore been done.

40.

The psychological problems involved in the explanation of these results are yet to be worked out-but they have at least been brought to light, and attention turned in their direction. Just what is it that happens when the change occurs that brings clearness and order out of the vague indefiniteness that seems to characterize the mental state of the stammerer? What are the emotional factors involved; what part do they play and how may they be controlled? These are questions for more intensive psychological analysis, and were not a part of this study. Its value rests in (1)-the fact that it may point the way toward the controlling factor in the correction of speech defect and (2)-in the ease with which such a method of correction might be practised in the regular class rooms of our public schools.

Names	History	First Examination						Second Examination						Grading on basis of work done	Teacher's Reports
		Sound	Familiar		Unfamiliar		Question Description	Sound	Familiar		Unfamiliar		Question Description		
			Poetry	Prose	Poetry	Prose			Poetry	Prose	Poetry	Prose			
"T" 14 yrs. H 6th Grade Attended class 6 wks.	Large, well developed girl. Small adenoids. Very badly formed teeth. Lisperd and stammered always.	t-d s-sh c-ch g	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	I "Very much improved" Group II (3 mo. later) Still improving. Will soon be normal.
"J" 14 years. B 6th Grade 5 weeks.	Nervous, shy boy. Did not talk till 3rd year. Stammered always. Bad case.	t-th wh	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	I "Much improved" Group I "Would like to continue." II "Constantly getting better. Much easier to get along with in class." III "Very much better."	
"I" 13 years. H 7th Grade 4 wks. 2 da.	Delicate girl. Weak heart. Stammered thru imitation of brother. Had scarlet fever and diphtheria and was much worse. Bad case.	O.K.	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	I "Still improving in spite of sickness and severe nervous strain. Will soon be normal."	
"B" 13 years. B 5th Grade 3 weeks.	Moody - quick to take offense. Considered by his teachers hard to manage. Stuttered 4 years. To cause know spoke rapidly - breathy. Repeated entire words.	O.K.	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	I "Not improved perceptibly but thinks he is getting better." II "Does not stutter at all except occasionally when reading."	
"L" 13 years. B 4th Grade 4 weeks.	Nervous boy. Very quick tempered. Stuttered thru imitation of brother. Spoke very rapidly.	th	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	I "Some what improved but slightly." II "About the same. Course too short."	
"M" 9 years. B 4th Grade 4 weeks.	Nervously inclined girl. Stuttered when excited, often for several days. Normal when rested but had frequent "attacks". Sweet disposition.	O.K.	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	I "Very much helped" II "Considered cured"	
"R" 11 years. B 6th 2 wks. 3 da.	Bright capable boy. Very active. Nervous and quick. Spoke rapidly. Stuttering in his family. Nice disposition.	O.K.	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	I "Not much change" II "About the same"	
"E" 9 years. B 3rd. 5 weeks.	Healthy, sweet-tempered child. Adenoids just removed. Stammered always. Long pauses between words.	could make the sounds but hesitates on m-t-g.	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	I "Some better" II "Same"	
"H" 14 years. B 7th Grade 5 weeks.	Stiff muscled jerky girl. Poor breath control. Very light voice. Not anxious to work.	O.K.	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	I "Has not shown much improvement. May outgrow it." II "About the same"	
"C" 12 years. B 4th 4 wks. 3 da.	Very bad case of asthma. Great difficulty in speaking aloud. Bad nose, throat and chest. Excitable. Stuttered for 2 years.	th-wh	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	I "Has shown improvement especially if careful to speak slowly." II "Very decidedly better"	
"H" 12 years. H 3rd. 6 wks.	Under sized, undeveloped boy. Bad case of heart trouble. Always stuttered. Bright but very young. Tendency to repeat.	th	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	I "Has improved in his pronunciation. Course has been a great help to him." II "Much improved in speech"	
"G" 10 years. B 6th 4 wks.	Bright, well developed boy. Stutters thru imitation of family and playmates. Speaks very rapidly.	O.K.	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	1-1-1-1-1 1-1-1-1-1 1-1-1-1-1 1-1-1-1-1	I "Very much helped. Wished he might continue." II "Same. Needs more training."	

I = hesitation.
 1-2-3-etc: number of seconds of hesitation. [when used as exponent]
 n = repeat.
 R = repetition of entire phrase to keep the thought.
 m = mistake.
 O.K. = correct.

I Teacher's report = directly after close of class.
 II " " = three months later.

BIBLIOGRAPHY

1. Ament, W. Begriff und Begriffe der Kindersprache. Samml. v. Abh. a. d. Geb. d. Pad. Psy. u. Physiol., 1902, Vol. V, No. 4, pp. 85.
2. -- -- Die Entwicklung von Sprechen und Denken beim Kinde. Leipzig, 1899, pp. 213.
3. Baldwin, J. M. Mental Development in the child and the Race. London, 1895, pp. 496.
4. Bell, A. M. The Faults of Speech. Washington, D. C., 1898, pp. 71.
5. Bell, A. G. Principles of Speech.
6. -- -- Visible Sound.
7. Conradi, E. Speech Development in the Child. Ped. Sem. Vol. XI pp. 328. Review of literature up to 1904.
8. Chervin, Note sur la Begayement. Bull. Acad. Roy. de Med. de Belg. Brux., 1886, 3s, XX, 24-35.
9. -- -- A Propos du Begayement Hysterique. Arch. d. Neurologie XXI, 365-374.
10. -- -- Begaiement et Autres Maladies Fonctionnelles de La Parole. Paris, 1901, pp. 551.
11. Coen, R. Ueber die Anwendung der Hypnose bei der Therapie des Stotterns. Med. Pad. Mon. f. d. Ges. Sprachhknnde. 1893, 170-172.
12. -- -- Uebungsbuch fur Stotternde. Vienna, 1891, pp. 146.
13. Comparye, G. L'Evolution Mentale et Morale De L'Enfant. Paris, 1893, pp. 371.

14. Denhard, R. Das Stottern. Leipzig, 1890, pp.299.
General discussion.
15. Darwin, C. A Biological Sketch of an Infant. Mind,
1877, II, 285-294.
16. Dewey, J. Psychology of Infant Language. Psychol.Rev.
I, 63-66.
17. Gruenbaum, F. Erklarung des Stotterns. Leipzig,1897,
pp.63.
18. Gutzmann, A. Offentliche Massnahmen gegen Sprachge-
brechen in Preussen. Med. Pad. Mon. f.d. Ges.
Sprachhlknde, 1891, I-II; 41-49.
19. Gutzmann, A. Das Stottern. Berlin, 1890, pp. 347.
20. Gutzmann, A. and H. Zur Prognose u. Behandlung der
Angeborenen Gaumendefekte. Med. Pad. Mon.f.d. Ges.
Sprachhlknde, 1893, 65-103.
21. Gutzmann, H. Beitrag zu dem Zusammenhang Funktioneller
Sprachstorungen u. Krankheiten der Oberen Luftwege.
Med. Pad. Mon. f.d. Ges. Sprachhlknde,1901,309-315.
22. -- -- Periodisches Stottern u. das Vorkommen des Stot-
terns bei Verschiedenen Rassen. Med. Pad. Mon.f.d.
Ges. Sprachhlknde, 1897, 225-234.
23. -- -- Das Stottern . Frankfort, a. M.,1898, pp.460.
24. -- -- Des Kindes Sprache und Sprachfehler. Leipzig,
1894, pp. 264.
25. -- -- Die Sprachliche Entwicklung des Kindes und ihre
Hemmungen. Kinderfehler, 1902, VII, 193-216.
26. -- -- Die Sprache des Kindes und der Naturvolker.
Ztschft.f. Pad. Psy.u. Pathol., 1899, I, 28-40.

27. Hall, G. S. Notes on the Study of Infants. Ped.Sem.I, 1891, 132-138-also
Hall-Stimpfl. Beitrage zur Kinderpsychologie und Padagogik. Altenburg, 1902, pp.45-62.
28. Heymann, F. Ueber das Stottern. Deut. Zeitschft. f. Nervenheilkunde, 1894, V, No.2 & 3. (Rev. in Mon.f. Sprachheilkunde, 1894, 204-206.)
29. Kirkpatrick, E. A. Number of Words in an Ordinary Vocabulary, Sci.,1891, XVIII, 107-108.
30. Kussemaul, A. Storungen der Sprache. Leipzig, 1885, pp. 299.
31. Kenyon, E. L. Discussion of G. Hudson-Makuen's paper in Penn. Med. Jour. Dec. '09.
32. Kyle, D. B. Discussion of G. Hudson-Makuen's paper in Penn. Med. Jour. Dec. '09.
33. Lukens, H. T. Preliminary Report on the Learning of Language. Ped. Sem.,1894-96, III, 424-460.
34. Liebmann, A. Untersuchung u. Behandlung Geistig Zuruckgebliebener Kinder. Berlin, 1898,pp.36.
35. -- -- Vorlesungen über Sprachstorungen. Berlin,1898, pp. 104, plus 58 plus 57 plus 48. Discussion of method.
36. -- -- Die Psychischen Erscheinungen des Stotterns. Mon. f. Psychiat. u. Neurol., IX, 177-184.
37. -- -- Stotternde Kinder. Samml. v. Abh.a.d. Geb.d.Pad. Pad. Psychol. u. Pathol., VI, No. 2, pp. 96. Experience with fifteen children.
38. Makuen, G. H. Physiology of Language and Its Relation to the Treatment of Stammering. N. Y. Med. Jour.Dec.

- 29, '06.
39. Makuen, G. H. Brief History of the Treatment of Stammering, with Some Suggestions as to Modern Methods. Penn. Med. Jour. Dec. '09.
 40. -- -- The Treatment of Stammering. Jour. Am. Med. Asso. Sept. 1910.
 41. -- -- Nomenclature of Defects of Speech. Laryngoscope, Nov. 1910.
 42. -- -- Diagnosis and Treatment of Some Functional Forms of Defective Speech. Phil. Med. Jour. 1901, VII, 251-255.
 43. McCready, E. B. Discussion of G. Hudson-Makuen's paper in Penn. Med. Jour. Dec. '09.
 44. Meumann, E. Die Entstehung der Ersten Wortbedeutungen beim Kinde. Leipzig, 1902, pp. 69. (Wundts Studien XX.)
 45. Mygind, H. Ueber die Ursachen des Stotterns. Arch. f. Laryng. u. Rhinol., 1898, VIII, 294-307. (Trans. in Annals of Otol., Rhin. Laryng., 1898, VII, 688-697.)
 46. Neumann, A. Ueber Sprachstörungen und Stottern beim Schreiben. Graz, 1893, pp. 71 plus 19 plus 4.
 47. Oltuszewski, W. Die Geistige und Sprachliche Entwicklung des Kindes. Berlin, 1897, pp. 43, (also Monatsschrift, f. Sprachheilkunde 1896).
 48. -- -- Beiträge zur Lehre von den Sprachstörungen. Med. Pad. Mon. f. d. Ges. Sprachheilkunde, 1894, 129-151; 65-85. 1895, 193-217. 1896, 65-86. 1897, 161-186; 200-207. 1898, 129-145; 165-178. 1899, 129-143; 161-166. 1903, 33-40.
 49. Preyer, W. Development of the Intellect. New York,

1889, pp. 317.

50. Preyer, W. Infant Mind. New York, 1893, pp.170.
51. Rzesnitzek, E. Zur Frage der Psychischen Entwicklung der Kindersprache. Breslau, 1899, pp.35.
52. Schultze, F. Die Sprache des Kindes. Leipzig, 1887, pp. 46.
53. Scripture, S. W. Treatment of Stuttering. Med. Record, N. Y. May 11, '09
54. Sikorsky, J. A. Die Seele des Kindes. Leipzig, 1902, pp. 80.
55. Ssikorski, J. A. Ueber das Stottern. Berlin, 1891, pp. 372.
56. Sully, J. Studies of Childhood. New York, 1896, pp.517.
57. Treitel, L. Stammeln als Folge von Stottern. Berl. Klin. Wochenschrift, 1891, 964-965.
58. -- -- Ueber Sprachstorungen u. Spracheutwicklung. Arch. f. Psychiat.u. Nervenkr, 1892, XXIV, 578-611.
59. Vierordt, K.von. Sprechen. Gerhardt's Handbuch, 1881, I, 454-457.
60. Wyllie, J. The Disorder of Speech. Edinburg, 1894, pp. 495.
61. Wundt, Wm. Volker-Psychologie, I, pt.1, pp.627; pt.2, pp.644. Leipzig, 1900.