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ORIGINAL COMMUNICATIONS.

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IS ADULT LIP-READING WORTH WHILE? A DETAILED STUDY OF 108 CASES.

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General Remarks: It is the purpose of this paper to discuss the remarkable work of the Army Lip-Reading School at Cape May, New Jersey (later transferred to Fox Hills, Staten Island), to explain the causes of its success and to suggest wherein we, in civil life, may gain from this unique experience. These deductions are based on the writer's intimate connection with the school during practically its entire existence, on his observations as medical officer-in-charge during eight months, on his own experience as a pupil, on the official records of the enrolled students, and upon subsequent detailed reports from the school principal, Miss Enfield Joiner, who went to Washington when the school was closed in December, 1919, to take charge of the follow-up work on the deaf soldiers conducted by the Bureau of Rehabilitation.

Lip-reading deals with two distinct types: the deaf-mute child, and the deaf but not mute adult. When one visits a state institution for the deaf, one wonders at the patience and optimism of the teacher, who, under such handicaps, lights the torch of intelligence for these little unfortunates. The inmate occasionally develops a scholarly mind, usually becomes a happy self-supporting citizen. Even the pessimist realizes how worth while it is when compared with any other method of teaching. We are concerned in this paper with the second or adult type.

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Our men would seem to have been hopelessly handicapped when compared with the average deaf adult in civil life who tries to learn this art. As will be pointed out, the soldier was uneducated, unwilling to learn, discouraged, desiring nothing but to go to a sympathetic home where a grateful government would support him for the rest of his unhappy days. How then, were we able to mould from this common clay results not equalling, but surpassing those in civil life? The self-sacrificing devotion and contagious enthusiasm of the principal and her eight co-workers will account for much, but devoted skilled teachers are available in civil life though circumstance does not group them so efficiently.

The inception of the school under Colonel Charles W. Richardson's tireless enthusiasm and Lieutenant-Colonel John M. Ingersoll's sympathetic guidance, the story of the nine expert teachers so carefully selected from the four corners of our country, the early beginnings, discouragements and difficulties, these are matters of history. It is our purpose to inquire into how this work was done and what results were obtained, in the hope that from our investigation we may find an answer to our question, and somewhat of profit for ourselves and for our deaf patients. Statistics are available, first hand impressions are here. Let us search through these data as to the types of men in the school, their previous educational advantages, the nature and severity of their deafness, the methods employed to teach them lip-reading, the response shown, and the permanency of these results. Conclusions will then be drawn which may perchance be illuminating.

DISCUSSION OF THE SCHOOL.

I. Enrollment: During its seventeen months' existence 112 men were enrolled in the Army Lip-Reading School. Four of these were soon taken out because they did not need this help. The remaining 108 comprise the group under discussion. Nine of these were born in eight foreign countries, the remainder were born in the United States. The average age was 26 years. Table 1 shows that most of them were enlisted men, and before entering the army were of the so-called laboring class.

TABLE I. OCCUPATIONAL STATUS.

Prior to Military Service.	Rank in the Army.
Farmers21	Nurse 1
Laborers13	Captains 2
Clerks11	Lieutenants 6
Machinists 6	Sergeants 8
Electricians 5	Corporals 2
Chauffeurs 4	Seamen 2
Scattered among 31 trades.....48	Privates89

The men were then relatively low in the economic scale. This would indicate a low mental acuity, lower than the average; a fact more clearly shown in Table 2 where we find less than one fifth with more than grammar school training, while one quarter were illiterate.

TABLE II. EDUCATIONAL ADVANTAGES.

College trained.....	4
High School trained.....	16
Grammar School.....	23
Primary School.....	38
Illiterate	27

2. *Degree and Cause of Deafness:* The arbitrary standard as to the degree of deafness qualifying for admission to the school was set by Col. Ingersoll after a careful study of the situation. Inability to hear ordinary conversation at five feet placed the man automatically in the school; he had no choice in the matter. A few showing progressive deafness were enrolled before their hearing had reached the five-foot limitation. Thirteen had their hearing so improved by treatment that they no longer needed lip-reading and were removed from the school. Some were totally deaf in one ear but had fairly good hearing in the other ear. Such were not assigned to the school. Most of the men had seen active war-fare, for 101 or almost 93 per cent went over-seas. Thirty-two of the entire group showed "total deafness," 13 could hear only a "shout" 24 heard more than a "shout" but less than "conversation" at 1 foot.

The extreme types of deafness were auditory nerve forms while the less severe cases were of catarrhal or suppurative origin. Most of the auditory nerve paralysis cases were of toxic origin in which meningitis was the chief cause, with influenza, scarlet fever, measles and mumps following. The concussion types of deafness were two-fold, those where there was a sudden heavy detonation near the ear, and those where the repeated and practically constant noise of heavy gun-fire created an auditory paralysis. Fifty-two of the 108 cases were suddenly deafened, 56 became progressively deaf, 2 showed an added hysteria. Table 3 gives a summarized list of the different forms of deafness and their frequency.

TABLE III. CAUSES OF DEAFNESS.

Otitis Interna, the result of meningitis.....	24
other toxemias.....	14
extension from middle ear forms.....	20
shell explosion.....	15
gun-fire (repeated).....	6
basal fracture.....	3
Otitis Media (11 duplications)	
suppurative origin.....	24
catarrhal origin.....	13
Hysteria (complicating the above).....	2

Thus the cases of pure middle ear involvement were only 26, against 82 cases (76 per cent) of internal ear deafness. This 76 per cent showing partial or complete auditory nerve paralysis parallels the 32 (almost one-third) totally deaf of the 69 (about two-thirds) that heard conversation at less than one foot.

3. *Course of Instruction:* The work was based upon Miss Martha E. Bruhn's classic book on the Müller-Walle method, this serving as a starting point to which were added many exercises culled from the teachers' large experience and from other authors. The progression was through definitely graded exercises. The teacher was changed from time to time in order that the student might get the benefit of varying methods and learn to read different lips. Every man came under at least four teachers, and they and the principal determined his grading from week to week, deciding finally as to his fitness for graduation, irrespective of the time consumed to complete the course. The average of these weekly grades gave his final rating. Five classes or degrees of excellence were distinguished.

TABLE IV. GRADES FOR MARKING STUDENTS.

Class I.	Excellent.	Ability to get 90-100% of what was said.
Class II.	Good.	Ability to get 80- 90% of what was said.
Class III.	Average.	Ability to get 70- 80% of what was said.
Class IV.	Fair.	Ability to get 60- 70% of what was said.
Class V.	Poor.	Ability to get less than 60% of what was said.

Group teaching was attempted and was found to be so inadequate as compared to individual work, that it was abandoned. We had twelve teachers including the principal. Three of these were assigned to teaching defective speech cases, an entirely separate group. The remaining nine taught from eight in the morning until three in the afternoon (with an hour and a half off for dinner), giving individual lessons to the men in turn. This meant an average of thirty-nine lessons per week, each representing concentrated and energetic effort, a truly hard schedule. The amount of work that each man should have daily was a matter of early experimentation. We found that it took perhaps fifteen minutes to get under way, and that a half-hour period did not yield as permanent results as a longer one. An hour was tried, but the concentrated work for so long proved too much, making the last fifteen minutes wasted. The compromise of a forty-five minute period was adopted, and experience proved it the best length. The frequency of these periods went through a similar stage of experimentation. We were anxious to crowd the men all we could. The decision came to three periods a day, two in the morning and one in the afternoon. The remainder

of their day was so filled with medical treatments, vocational exercise, and play, as to take their minds off of this work. As they progressed, they were encouraged in every conceivable way to talk with their fellows. Mirror exercises were tried, but the work in the class-room and the intercourse with the other men proved better practice. The detail of class-room arrangement also went through a process of change. Extraneous noises troubled the teacher, while extraneous motions took the student's eyes away from the teacher's lips. A quiet small room with good daylight illumination which the teacher faced, a small table between two straight-backed chairs, such was the ideal equipment. As there were not rooms enough, we were obliged to put two groups of teacher and pupil in each room. With a little fore-thought and planning this answered very well.

4. *Methods of procedure:* At first, charts showing the mechanics of speech production were used. These were of interest to the analytically minded, but proved more confusing than helpful; so they were abandoned. The teacher followed a carefully graded course, but the pupil followed from lesson to lesson as a child would, without understanding its progression. First, familiarity with the essential vowel sounds was gained. Then in succession these vowels were used in conjunction with labial consonants, then dental consonants, then palatal and throat sounds. As his vocabulary became enlarged it was used in the composition of sentences which in turn became harder and more complex. Almost before the pupil realized it, he found himself seeing words instead of sounds, groups of words instead of individual words, and finally the skilled reader would follow the lips as one glances down the printed page, grasping the meaning with little thought as to the individual letters and words. Thus, step by step was the eye trained, the power of picture-visualizing of lip-movement groups developed. In a few this power is already present; occasionally it is developed with but little effort; for most, it is a tedious and nerve-racking process. In a man's ability to develop these instinctive brain paths lies his success as an expert lip-reader.

PERSONAL OBSERVATIONS.

1. *The Writer's Efforts As a Lip-reader:* It chanced that the writer has a chronic catarrhal deafness and he was urged to take advantage of this opportunity to learn lip-reading. Through the courtesy of his fellow officers, he was granted an hour off each day to devote to this work. Interruptions were frequent, days passed without any lessons, progress was slow. To see an illiterate negro

acquire in a week what it had taken him a month to get, was not particularly reassuring. Through it all he tasted the hesitations and discouragements, the successes and failures the other men had described. As a rule he hurried to his lesson from some task which had been absorbing his attention. If he could drop completely from his mind this previous task, and give his undivided attention to his teacher, the first fifteen minutes gave some accomplishment, but frequently it took this long to get under way. The psychologist tells us that a man's mental reactions are more prompt in the afternoon; the writer found an early morning hour more profitable. A previous good night's rest made a difference. An optimistic, cheerful, but nevertheless persistent and aggressive teacher, who meant business from the first, was better able to get him started. As the lesson progressed, even with occasional rests, the eyes became strained and the brain tired. At times there was an uncontrollable desire to yawn. By the time the forty-five minute period was up, he was as ready as the proverbial school boy after a long hard day, to run out and play. He never took more than one lesson a day, the others took three; he always wondered how they stood it. Perhaps he could have gotten used to it; the others did. He did not get the conjunctivitis and lacrimation that some of the men had (though they had no refractive error), nor did he suffer from the sleeplessness at night which troubled some for a while. Hours of reading the printed page proved far less taxing than watching the teacher's lips for half an hour.

Not only must the eye work, but the memory as well. An illustration will serve. Among the early simpler exercises was the differentiation between such words as "pay," "bay" and "may." As we are not dealing with sounds but looks, these words look exactly the same when spoken. The context alone can tell. If one already has the sense and knows the discussion is about "money," he instinctively eliminates the other words and decides in favor of "pay." But if this key-word or idea of "money" has not yet been grasped, he must retain the different possibilities in his memory until the speaker brings in the key-word. With this obtained, all the lip-movements of the sentence held in the mind as separate parts of a picture puzzle now rapidly fall into their proper places, and the alert lip-reader is already watching for the fragments of his next picture. An analytical mind may here get into trouble by dwelling on detail. The illiterate student was not thus disturbed. He reads the lips as a child absorbs the sentence, instinctively. We find then, that two of the most important factors for success are:

first, the ability instinctively to see and comprehend mouth movements and positions; second, the power to hold without effort the memory picture of succeeding words and word groups.

2. *The Psychology of Lip-reading*: It has been mentioned that the writer succeeded better when he got started well. Success fostered optimism, which in turn fostered success. A stumble not only halted this progress but turned the tide in the other direction. A word is missed, the teacher patiently returns to it, repeats it, but the pupil cannot make what it looks like fit into the context. The wise teacher now changes the word or the context, approaching the word from a different angle. When once gotten, she brings it in unexpectedly later. The pupil is delighted to find how cleverly he reads that which at first seemed so hard, and on this wave of success he hastens on for new worlds to conquer. Suppose the teacher had insisted that the word in question be gotten, and in the particular sentence. She spends several minutes repeating it. The pupil becomes more bewildered. His eye wanders. She finally writes the word out for him. How stupid the pupil feels to have missed so easy a word. Another comes along, and he misses that. Each succeeding failure is not of importance itself, but the sum-total makes a considerable difference when the hour is done. This phase is italicized for it is thought to be important. If any one holds converse with a lip-reader and the idea is not readily grasped, it is far better to change the word or the context than to delay with useless repetitions. An insistence on such repetition will bewilder the best of lip-readers.

3. *Early Skepticism, Later Enthusiasm*: The early days in the school were the hardest, for none could see the results that might be expected. The men had entered the army, young and strong, with normal hearing in most cases. Now they were returned from the trenches, deaf and despondent. The future was black. They wanted nothing but to be allowed to go home where loved ones would pet and praise, and where the government was to give them a handsome pension. Instead, they were shipped to a desolate beach on the New Jersey shore. The hero had to sit opposite a school teacher three times a day and repeat such exciting sentences as "She may pay," "The cat plays with the ball." Perhaps he was good-natured enough to let her amuse herself in that way for a week, but sooner or later he did not like it and said so. He was under military discipline, but the returned doughboy was a hard man to manage. Occasionally he refused to go on with the work, either

would not report for his lessons, or after reporting would make no effort to learn. On the other hand, a few after trying became so discouraged and despondent that they broke down and cried before their teachers. None but these urging, patient, enthusiastic women could have won through.

Such were the early trying days. Quite different was the experience of the later arrival. The inertia of the unwilling, of the ungrateful, and of the ignorant had been overcome. The newcomer found enthusiasm on every hand. He applied for enrollment before the initial medical examination could be made. After getting started, he would report ahead of time rather than run the risk of losing a little of his hour. He in turn felt responsible for starting the next man out well. Listen to this message of cheer to a raw recruit from one of our poorest pupils.

Note from one pupil to a new arrival:

"I use to be like you are. And look at me now. I am good and healthy. Spinal Medgitus. My neck was stiff and I could not straighten my legs out. I thought I would never be able to walk. I could not see very good either. But everything is all right with me now. Only my ears. A fellow don't need to hear. They learn you how to read the lips here. It is surprising how well you can learn it. I have not took many lessons but I can read the lips a little now. I see a fellow here the other day. You wouldn't know he was totally deaf. He could read the lips so good. He was home on a furlough and his parents didn't know he was deaf. You can be learned."

4. *Some of the Most Difficult Cases:* This particular spinal meningitis case proved a peculiarly hard one to teach lip-reading to. Progress was fairly satisfactory during the lesson, but the next day found him back where was the day before. Others showed the same characteristic in a varying degree. It was thought to be due to an actual memory impairment, a consequence of the meningitis. This showed in only the severe forms. Of this type were our two failures. They could read the lips, and with sufficient success to make them far happier than they had been; but in comparison with the others they did so poorly as to be a keen disappointment to their zealous teachers. Others at first equally backward were finally taught successfully, through the persistence and prolonged effort of the teacher. There was never a thought of any man's being unable to learn this most difficult of arts. What could have seemed more useless than the initial work done on one poor illiterate negro who came in dirty and unkempt, apparently lacking the power of intelligent thought, without the sense of hearing or the ability to speak or read or write? Though his vision seemed normal, he customarily stared vacantly into space and paid

no attention to people or things around him. Touching him made him jump and quiver from apparent fright, somewhat as in the shell-shock cases. His attention was gained by passing the hand in front of his face repeatedly. In some way, the records on this case had been lost, and the cause of his deafness, loss of speech and mental torpor was never satisfactorily established, though we were able to gain a definite history of his having been badly frightened by a train, which almost ran over him. Ignorant and confused, he did not know why he had gone to France; but his pleasure and relief were genuine when we were finally able to make him understand that the war was over. "Done killed the Kaiser?" was his first response while a smile lit up his rather sad features. The story of his restoration would fill a volume. His first dawning consciousness came with the sight of a bright thimble. Words began to come, haltingly at first, then more easily. Forty-five minutes were consumed before the teacher could make him understand that she wanted him to move a small object from one place on the table to another. Each succeeding lesson showed progress. His speech returned entirely. His skill in reading the lips was so absolute that visitors amused themselves by speaking in French or Italian to him. His ability to read the mouth motions enabled him to repeat these words, though they made no sense to his untutored mind. In the meantime, he was learning to read and write and figure. Finally he went back to his chickens in the Sunny South, a happy negro, and a wiser.

5. *A Word About the Easy Cases:* To dwell on the hard cases is to give a faulty impression. This has been done rather to show how these methods yielded results comparing favorably with the average lip-reader in civil life though the material to work with would be considered hopeless in civil life. To dwell on the many good cases is easier. Many of the members of this Society were able to see the work when we brought a few of them to the Atlantic City Meetings early in the summer of 1919. You will recall talking easily with them in the hotel parlors, you will remember the speed with which they could catch and answer questions, not only under these informal conditions, but while under the stress of a formal exhibition. Fear and embarrassment overwhelm poorer lip-readers; these men stood before a large gathering and were able to distinguish the lip-movements of questioners in the middle of the audience. Some of the men were so successful that they were requested for the Liberty Loan drive in October 1918. Individual stories had their amusing side. One man enjoyed sitting on the porch of an

evening with his lady friend. She was sure he must hear her until we suggested her getting her face out of range of the bright street light a block away. A second man dreaded telling his people that he was deaf. After a month of training, he asked for his furlough and went home. For two days he kept them ignorant of his deafness, and when he finally told them they did not at first believe him. One of the men was called down to see the Commanding Officer. After the interview, the latter asked the writer whether the man was not a malingerer for he understood so readily that he surely could hear. When sending them home to see their folks we always let them go unattended and they never seemed to have any trouble in getting around. The Red Cross workers planned their travel as they did for those who could hear; they had no added help. Thus stories of their successes and the astonishment of those who talked with them, could be multiplied indefinitely. With this word to outline the measure of this success, let us pass on to a more scientific discussion of their work and its results.

SUMMARIZED RESULTS.

We have noted that the men were graded into five classes according to their ability to read the lips in active practice and that these marks were reported to the officer-in-charge once a week. The final average gave us his graduating grade. The results for the 108 men may be summarized as follows:

TABLE V. NUMBER OF MEN IN EACH GRADES.

I. Excellent.	57 men or 53%
II. Good.	23 men or 21%
III. Average.	5 men or 4%
IV. Fair.	16 men or 16%
V. Poor.	7 men or 6%

This shows that though a high standard was required for graduation, 74 per cent of the pupils were graded "good" or "excellent," and could understand over 80 per cent of what was said to them. As would be expected, the "excellent" men completed the work in the shortest time.

TABLE VI. TIME REQUIRED BY DIFFERENT GRADES.

I. Excellent.	2.1 months.
II. Good.	3.3 months.
III. Average.	5.0 months.
IV. Fair.	5.3 months.
V. Poor.	6.0 months.

A few completed the course in six weeks. The average time was 2.7 months.

Nor was the educated mind the quickest to learn, the advantage resting a little with the uneducated, as the following table will show.

TABLE VII. AMOUNT OF EDUCATIONAL ADVANTAGES IN EACH GRADE.

Grade	College	High School	Grammar School	Primary Grades	Illiterate	Total
I. Excellent	3	8	13	21	12	57
II. Good	0	2	4	11	6	23
III. Average	0	2	3	0	0	5
IV. Fair	1	3	2	4	6 (3 foreign)	16
V. Poor	0	1	1	2	3 (all foreign)	7
Total	4	16	23	38	27	108

Tables 6 and 7 seem to show that skill in lip reading is a natural gift, more than an acquired one. Those who made the best lip-readers and remained the best took the shortest time to complete the course. And greater book-learning did not help. Here we find that 65 per cent of the high school or college men attained the first two grades, while 77 per cent of the primary grade and illiterate group also had this ranking. This deduction is borne out by the writer's observations. The rapid pupil was imaginative and quick in ocular observation rather than profound in his thought processes. This need not discourage the educated mind, for two of our college men were among our very best lip-readers. The point made here is that the teacher should rely more on the intuition and imagination of the pupil than upon his analytical acumen and memory.

The degree of deafness of the men in the different grades is of interest. It shows a fairly even distribution in the "excellent" grade, and a preponderance of totally deaf in the "poor" grade. This latter is accounted for by the sluggish mentality of some of the meningitic deaf.

TABLE VIII. RELATION OF DEAFNESS TO EXCELLENCE OF WORK.

Grade	Totally deaf	Hears shout	Con- versation up to 1 ft.	Con- versation over 1 ft.	Total
I. Excellent	13	10	14	20	57
II. Good	3	2	7	11	23
III. Average	1	1	1	2	5
IV. Fair	11	0	1	4	16
V. Poor	6	0	1	0	7
Total	34	13	24	37	108

Reviewing briefly these statistics we find that a very large proportion of the men on graduation could understand over ninety per cent of what was said to them; that the average time taken for this work was only 2.7 months (and this average included all the slow pupils); that a higher education was no advantage, for the illiterate learned as easily; and that a total deafness was no handicap, as these men learned as readily as those who could hear a little.

In order to make this report of more scientific value, the writer inserts here illustrative cases which will briefly explain how we can arrive at the above inclusive tables. These representative cases are taken from group 1 to 5, according to their excellence as lip-readers (see Table 4). Each of these five groups is subdivided into three classes according to the educational advantages each had enjoyed: Class A being those with high school training or better, Class B those with some grammar school training, and Class C the illiterates. These are furnished through the courtesy of the recent Federal Board Agent, Miss Joiner, and show the careful follow-up work enjoyed not only by these men but also by those unfortunate war-deafened soldiers, who in the shuffle failed to reach us and had to be picked up after discharge. These latter show a grand total of over five-hundred men and represent an outstanding and splendid chapter in the Federal Board's activities, which cannot be touched upon in this paper.

Table 9. Illustrative cases grouped according to grades of lip-reading skill, and into Sub-classes according to previous educational advantages.

GROUP I. LIP-READING EXCELLENT.

Case I-A. Good education. L. F. B., Cressona, Pa. Rank, Pvt. 1st class; age, 29; cause of deafness, exposure; degree of hearing, rt. 1/20; left 5/12/20; education, college graduate; previous occupation, civil engineer; lip-reading instruction, May 9, 1919, to June 26, 1919; grade of work, excellent; further training, refused; married, since discharge; present occupation, civil engineer. Remarks: This man, now employed by State Highway Commission of Pennsylvania, has been able to carry on successfully since discharge. Earning capacity neither increased nor decreased. Gave demonstration of lip-reading before American Medical Association at Atlantic City, June, 1919.

Case I-B. Slight education. G. S., Newport, Kentucky. Rank, Pvt. Co. K, 8th Inf.; age, 33; cause of deafness, concussion; degree of hearing, rt. 1/20, left 0/20; education, 4th grade; previous occupation, soldier, regular army; lip-reading instruction, July 24, 1918, to Sept. 28, 1918; grade of work, excellent; further training, placement training in lens-grinding under Federal Board; not married; present occupation, lens grinder. Remarks: This man went out after two months' lessons in lip-reading and toured the country for a month, speaking for the 4th Liberty Loan. Red Cross visitor reported to U. S. A. General Hospital No. 11 that she called on this man four times at his place of work before she knew that he was deaf. Federal Board follow-up officer reported that two years after discharge this man's lip-reading was practically infallible.

Case I-C. Illiterate. S. S., colored, Calvert, Texas. Rank, Pvt. Co. A, 304 L.B., Q.M.C.; age, 30; cause of deafness, bilateral otitis interna; degree of deafness, total; education, illiterate; previous occupation, farmer (tenant); lip-reading instruction, Sept. 25, 1918, to Nov. 23, 1918; grade of work, excellent; further training, refused; married, previous to service; present occupation, farmer. Remarks: This man reported that he was at home four days after discharge before his wife discovered his deafness. Federal Board agents advised no further training.

GROUP II. LIP-READING GOOD.

Case II-A. Good education. P. W. J., Red Oak, Iowa. Rank, Pvt. Co. H, 18th Inf.; age, 18; cause of deafness, chronic suppurative otitis media; degree of hearing, rt. 1/20, left 5/12/20; education, graduate of high school; previous occupation, student; lip-reading instruction, August 5, 1918, to Sept. 28, 1918; grade of work, good; further training, served as supervisor for one year at the Pennsylvania Institution for the Deaf (Oral School); took training under the Federal Board in mechanical drafting; not married; present occupation, student. Remarks: Federal Board follow-up officer reported in December, 1920, that a student, deaf for twenty years, had just enrolled for a lip-reading course in Chicago, explaining that she had not believed in lip-reading until an ex-service man had come home from an army hospital almost totally deaf, but "reading the lips wonderfully." This soldier was identified as Case II-A.

Case II-B. Slight education. J. M., Beaver Falls, Pa. Rank, Pvt. Co. F, 111 Inf.; age, 37; cause of deafness, concussion; degree of hearing, rt. 4/20, left 0/20, blind in one eye; education, 4th grade; previous occupation, sailor; lip-reading instruction, Feb. 5, 1919, to May 1, 1919; grade of work, good; further training, refused; not married; present occupation, sailor. Remarks: Red Cross visitor reported that this man was earning more in fall of 1919 than he had earned previous to military service; that his lip-reading was very good; advised no further training.

Or Case II-B. Slight education. J. W., Philadelphia, Pa. Rank, Sgt. Co. C, 102 Eng.; age, about 25; cause of deafness, concussion; degree of hearing, rt. 0, left 4/20; education, primary grades; previous occupation, street car conductor; lip-reading instruction, Jan. 21, 1919, to May 17, 1919; grade of work, good; further training, refused; married, since discharge; present occupation, mechanic. Remarks: This man was seen by his teacher, Oct. 22, 1921. In a conversation on Chestnut St., Philadelphia, with a stream of people passing, it was not necessary for her to repeat anything she said to him. The person who happened to be with the teacher did not discover that the man was deaf. He reported that he was doing well, working for the Ford Motor Company at their assembling plant.

Case II-C. Illiterate. W. L., Lucama, N. C. Rank, Pvt. Co. I, 324 Inf.; age, 24; cause of deafness, meningitis; degree of deafness, total; education, man practically illiterate; previous occupation, farmer; lip-reading instruction, March 17, 1919, to August 23, 1919; grade of work, good; further training, refused; not married; present occupation, farmer. Remarks: In a private letter, practically illegible, this man in the spring of 1920 wrote his teacher to the effect that he was reading the lips better than he ever hoped he could; that with a few repetitions he could understand strangers very well and had no trouble whatever with his friends. One statement he made was: "I don worry no more about bein deaf."

GROUP III. LIP-READING AVERAGE.

Case III-A. Good education. Lt. F. W. B., Shiner, Texas. Rank, 2nd Lt., 56 Art., C.A.C.; age, 21; cause of deafness, concussion; degree of deafness, rt. 1/20, left 1/20; education, high school graduate; previous occupation, student; lip-reading instruction, Nov. 25, 1918, to April 12, 1919; grade of work, average; further training, entered University of Texas to take course in chemical engineering under Federal Board; not married; present occupation, student. Remarks: This man was able to follow along with his classes in the university.

Case III-B. slight education. G. R., Brookline, Mass. Rank, Pvt. 1st cl., R.A., Ae. Sq.; age, 19; cause of deafness, scarlet fever; degree of deafness, total; education, grammar school; previous occupation, plumber; lip-reading instruction, July 24, 1918, to November 30, 1918;

grade of work, average; further training, architectural drawing, Wentworth Institute, Boston; preparatory course, Hutchinson School, Boston; expects to enter Mass. Inst. of Technology, Boston, this fall; has studied French under private tutor; has availed himself of all opportunities for lip-reading lessons and has made marked improvement; not married; present occupation, student. Remarks: The ambition of this man is apparently without limit. With only a fourth grade education as foundation, he has been able, handicapped by total deafness, to prepare himself for Boston Tech. One year after discharge, he wrote his teacher of lip-reading: "I have improved greatly during the past year, not only in lip-reading, but in other things. Whoever, or whatever is responsible for my deafness knew that was the only way to teach me things."

Case III-C. Illiterate. No illiterates in this group.

GROUP IV. LIP-READING FAIR.

Case IV-A. Good education. J. E. S., present address unknown. Rank, 1st Lt., C.W.S.; age, about 35; cause of deafness, bilateral otitis interna after diphtheria; degree of deafness, rt. 1/20, left 2/20; education, college; previous occupation, chemist; lip-reading instruction, March 29, 1919, to August 23, 1919; grade of work, fair; further training, refused; married; present occupation, chemist. Remarks: Red Cross follow-up report stated that this man was considered so valuable in his line that he had been retained in the Chemical Warfare Service, U. S. Army; also, that his lip-reading served him well and that he was carrying on successfully.

Case IV-B. Slight education. T. H., Troy, N. Y. Rank, Pvt. Baty. C, 149 F. A.; age, 19; cause of deafness, meningitis; degree of deafness, total; education, grammar school; previous occupation, student; lip-reading instruction, Dec. 28, 1918; to May 17, 1919; grade of work, fair; further training, lip-reading at Nitchie School, N. Y., and mechanical drafting; improvement in lip-reading, negligible; not married; present occupation, student. Remarks: The training of this man has been delayed and interrupted by ill health.

Case IV-C. Illiterate. R. J., Gaville, S. D. Rank, Pvt. Co. D, 349 Inf.; age, about 28; cause of deafness, meningitis; degree of deafness, total; education, practically illiterate; previous occupation, farmer; lip-reading instruction, May 19, 1919, to Sept. 29, 1919; grade of work, fair; further training, refused; present occupation, farming; married, yes. Remarks: This man wrote to his teacher that he could understand his wife perfectly and his friends fairly well. He made \$10,000 in two years on his small ranch. In November, 1920, he wrote: "I can do better on the farm. I don't like cities noway."

GROUP V. LIP-READING POOR.

(Illustrating the Discouraging Cases.)

Case V-A. Good education. J. G., Muskogee, Oklahoma. Rank, Pvt. Co. A, 12 Inf.; age, 30; cause of deafness, meningitis; degree of deafness, total; education, grammar school, supplemented by wide reading and study; previous occupation, lumberman; lip-reading instruction, April 9, 1919, to December 13, 1919; grade of work, poor; further training, lip-reading in two different schools, improvement negligible; not married; present occupation, none. Remarks: High type of man, but it seems impossible for him to pull together and go to work. Physical condition fair, but mental state depressed.

Case V-B. Slight education. R. H. M., Chicago, Ill. Rank, 2nd cl. seaman, U. S. Navy; age, 18; cause of deafness, meningitis; degree of deafness, total; education, primary grades; previous occupation, none; lip-reading instruction, Dec. 20, 1918, to July 7, 1919; grade of work, very poor; further training, 300 lessons, two per day for six months, in lip-reading—improvement negligible; cabinet making in Lewis School, Chicago; not married; present occupation, student. Remarks: This man has kept on trying steadily and is still hopeful of becoming expert. He

has made some progress, but will never be a good lip-reader. Spirit fine. While in hospital he wrote to another deaf man: "A fellow don't need to hear. It is surprising how well you can learn it. I have not took many lessons, but I can read the lips a little."

Case V-C. Illiterate. O. H., Chicago, Illinois. Rank, pvt. Co. C, 52 Tr. C.; age, about 32; cause of deafness, boiler shop concussion; degree of deafness, rt. 1/20, left 1/20; education, none; previous occupation, metal worker; lip-reading instruction, Feb. 12, 1919, to June 21, 1919; grade of work, very poor; further training, lip-reading and cabinet making, Lewis School, Chicago; married, and has two children, family live with wife's parents; present occupation, student. Remarks: This man will never be able in all probability to support a family again. In addition to being a poor lip-reader, he is stupid and lacking in energy and purpose.

These foregoing cases representing each group are inserted to illustrate in detail the above generalized statistics. They contribute the added note of subsequent success. The Federal Board was able to get in touch with all of our students and discovered how they were faring. In each case they were retaining most of their skill, and where they needed further help, the Board was able to provide it. Most of the men returned to former occupations. In one of the reports we find this comment as to the occupations followed:

"The deaf men whenever it has been compatible with their disability, have chosen vocations wherein their pre-war experience could be capitalized. Two doctors have specialized in X-ray work and public sanitation work; one lawyer in insurance law. Some of the courses selected by the deaf are mechanical drawing, cabinet making, barbering, printing, shoemaking, accountancy, architectural drawing, cartooning, and journalism."

That the men can read the lips successfully seems to be proven beyond a doubt by the reports from so many varying and unbiased sources. Letter after letter offers its added contribution on this score. Many are doing better financially than they did before they became deaf. The broadening influence of their army experiences is in part responsible, but in many cases the more immediate influence of the high-minded teachers can be directly traced. Under their inspiration, some of the men are seeking a higher education. One man has gone successfully through the first year at one of our post-graduate scientific schools; another who had had only grammar school training is preparing for a Technology school in order to become an architect. The list includes men in our colleges and state institutions.

ADULT LIP-READING IN CIVIL LIFE COMPARED.

While the writer's intimate knowledge of this work in the Army permits him to speak authoritatively in this field, he cannot speak so definitely of any similar group in civil life. Comparisons may,

therefore, seem ill-founded and premature. He has, however, come in personal contact with several of this latter class, has discussed the work with teachers of the deaf in civil life, and has considered this phase with our army teachers who know intimately of civilian work. From these observations and deductions, he cannot escape the conclusion that those in civil life, though starting with greater advantages and a higher mentality, do not attain a like degree of excellence excepting after a much more protracted training, and the percentage of excellent results is lower. One teacher says that the civil work is not as interesting as that in the army. Another writes:

"It seems to me there can be no doubt about the advantage of army lip-reading over that in civil life. That lip-reading means 'eternal practice' is certainly true. The frequent lessons and constant practice enjoyed by the men in the army furnished the surest means of their success. "It has been my experience that the majority of the civilian deaf are prodigal with neither the time nor the money spent on lip-reading. Although, I believe I have never had a pupil who did not seem interested or convinced that it was worth while, if anything had to be postponed it was usually the lip-reading lesson. I can rarely persuade a pupil to come every day for two months, rather than once or twice a week for eight or nine months."

A third teacher describes two cases: one a woman of twenty-eight, a stenographer, who had five lessons a week for five weeks with good results; the other was a banker and college graduate, fifty years old. She says of him: "He was under my instruction for six months but had taken lessons off and on since becoming deaf. He admitted that he never practiced except during his lessons and even then refused to take any sort of drill work. He just wanted conversation or stories, but he really needed intensive drill work. He had one lesson a week."

Another teacher has recently visited a school for teaching adult deaf. Her comment is interesting. "I do not blame doctors much for not believing in lip-reading. They see such poor results. The civilian teachers haven't the organization, the intensive work, the regular attendance, the teaching personnel, or the standards the Army School developed."

One teacher makes this comment: "In civilian life the poor and ambitious can spare neither the time nor the money; the rich are spoiled and pampered and will not work." She adds that she had recently seen a good many deafened soldiers taught by civilian methods and that she could not recall two which she would grade as "excellent," according to our Army standards.

Some of the teachers have kindly furnished data concerning some of their adult deaf students in civil life. The ages range from seventeen to seventy years. Without exception, the more intensive the training, the better the success. In recent pupils where the teachers had been able to use the same methods as those employed in the army, the results were equally gratifying. The age of the pupil seemed to make little difference. Earnestness and continuity of effort were the essential factors. Space does not permit a detailed report. The following summary gained, not only from these cases but from other opinions and from the writer's observations, is very suggestive.

TABLE X. SUMMARIZED COMPARISON.

Army School.

Average age, 26 yrs.; educational advantages, low; time for course, 2.7 months; lessons per week, 12; cost of instruction, about \$0.80 per hour; teaching personnel, trained teachers of experience from schools for the deaf; sudden or progressive deafness, equally divided; results, very good in about 75%.

Civilian Teaching.

Average age, 35 to 45 yrs.; educational advantages, rather high; time for course, 6 to 12 months; lessons per week, 1 to 3; cost of instruction, \$2.00 to \$3.50 per hour; teaching personnel, largely teachers who have learned lip-reading because of their own impaired hearing, and have then gone right into teaching; sudden or progressive deafness, progressively deaf in almost every case; results, a much lower percentage, figures not available.

Some may know of instances where results were equal to ours. The writer's contention is that results equal or better should be obtained; that the soldier's initial unwillingness, his despondency, and his inertia, were real handicaps; that a civilian with the will to succeed and the energy and ability to carry out such an intensive program as the Army School followed, should do better than our students did.

CONCLUSIONS.

Is adult lip-reading worth while? Our answer is: emphatically, yes. We of the Army School have seen its merits and cannot but make a positive and enthusiastic answer. Working with ignorant, many of them illiterate men, men drawn from the lower economic and social strata of civil life, lacking in enthusiasm, desirous only to be allowed to go home and be left alone, from such a group our trained and devoted teachers were able to produce good lip-readers in an average time of 2.7 months. The best took only six or seven weeks. Many were so brilliant that visitors repeatedly insisted that they must hear. According to available testimony, the results obtained from this apparently hopeless material averaged better than that obtained in civil life.

Wherein did this success lie? In our splendid teaching force? Yes. In our military control over the men's activities? Yes. But not in these only. From the above necessarily cursory review of our year and a half of endeavor in behalf of our war-deafened soldiers, I submit that the intensive nature of our program played a very important part in our success. If this is so, and if the civilian results have proved in any measure unsatisfactory, I conclude that civilian teachers and civilian deaf may profit from our experience. This experience would urge that, where feasible, teachers be grouped in schools, centers to which the lip-reading student can repair. These teachers should be especially trained workers, devoting their undivided energies to this work. Whether those who are themselves deaf can make as acceptable teachers, I cannot say. Our peculiar needs were better served by those who could hear. Each pupil had better be under the successive tutelage of several teachers, gaining from the variety of such a training. He should be taught individually, not as one of a group. He should make lip-reading during this intensive study his main business, not an avocation. Lessons should be conducted daily, not weekly; and twice a day is better than once. Practice work should be conducted in addition to the regular lessons. The pupil should be saturated with lip-reading. Thus did we gain notable success, thus can the civilian student gain equal success.

It behooves the otologist to foster this work; urge the teacher toward thorough preparation, encourage the deaf patient through the early discouraging efforts into the benefits his persistence will secure him. The otologist can do more. Lip-reading is in its infancy. The Clarke School for the Deaf under Miss Yale's inspiring leadership again points the way, as it did in 1867, by planning for special research work, taking up for instance the educating of islands of hearing which can be found in some considered totally deaf. In such, and other lines of research, the otologist can help.

Lip-reading is far from a perfect substitute for hearing, but it is the best we have. There are so many deaf seeking relief. Shall we confine our efforts to treating those cases that can be aided, or shall we foster every enterprise that looks towards a lightening of the burden? There are the many auditory paralysis cases whose hearing the present mechanical appliances and electrical magnifiers cannot improve. There are the many partially deafened children in our public schools who cannot keep up with their classes and whom lip-reading would immeasurably help. Peculiarly does this work deserve our enthusiastic support.