



DAN R STEWART
MASTERS THESIS
IN ARCHITECTURE
MASSACHUSETTS
INST TECH 1955

I dedicate this thesis to all deaf children, that they, in particular, may some day find their educational surroundings more in keeping with their spirit.

August 10, 1955.

Pietra Belluschi, Dean
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Cambridge, Massachusetts

Dear Dean Belluschi:

In partial fulfillment of the requirements for the degree, "Master in Architecture", I, herewith, respectfully submit a thesis entitled, "A School for Deaf Children".

Sincerely yours,

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A SCHOOL FOR DEAF CHILDREN

Submitted in partial fulfillment
of requirements for the degree
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ABSTRACT

A School for Deaf Children, submitted by Dan R. Stewart in partial fulfillment of requirements for the degree, "Master in Architecture".

School of Architecture and Planning
Massachusetts Institute of Technology
Cambridge, Mass. August 10, 1955.

My reasons for choosing to do a "School for Deaf Children" as my Architectural Design Master's thesis are not too numerous but broad enough, I believe, to encompass a sound program for development. Some ideas germinated over a year ago and some came to light after being confronted with the obligation of having to do a final research problem to complete my architectural studies. Listed below are three factors that should play prominently in the choice of a theme for a Master's thesis and these three ideas, in a sense, form the skeleton of all of my preliminary thinking that finally lead to a design solution for a School for Deaf Children.

MATURITY OF CHOICE: A Master's thesis should, in broad terms, reveal a matured curiosity into those problems and aspects of life which can bear the author the greatest possible fruit for his future and at the same time offer to others, even if only theoretically, a glimpse at an attitude of thinking that would tend to benefit those around him. A final thesis, such as this, should make the attempt to solidify and to verify certain feelings, thoughts and opinions that a student has built up through the years of his so-called "formal education". Through these years many theories, both his own and overwhelmingly those of "accepted" authorities

have been in constant conflict and it is now that the opportunity pre-²
sents itself for a definite statement of one's own feelings.

It would be unfortunate indeed if these thoughts and feelings, as put forth now, should find themselves inflexible so that they would remain stringently unchanged as time moves on. It is most important to carry a set of values that are capable of a good "house cleaning" from time to time but, nevertheless, to be able to declare one's self as I do now - to say, "This is my attitude today."

SOCIAL SIGNIFICANCE: It is important to search for a subject that can offer the best possible situations for putting across the ideas that are highest in one's mind. I believe that it should be a choice having a decided social significance, one that can offer an insight into fields less talked about, less known and even misunderstood. This is the opportunity to delve into fields that have been thought of as being confined to themselves as humanitarian professions without benefit of assistance from any other sources of inspiration.

ARTISTIC APPROACH: The needful and complex processes involved in the education of the deaf is to me an intriguing and inspiring topic with which to deal because here is a good example of where educating processes and proper housing of these processes are two things completely divorced from each other. Their educational system is moving forward while their architectural settings are deteriorating. Surely the art world can add needed physical and visual stimuli to an already stimulating field of study.

The deaf child living in a "hearing world" is by necessity brought

into sharper contact with the visual aspects of life. In some ways perhaps the things that he sees help in a small way to compensate for all that is not heard. It might be safe to say that he is able to appreciate the visual side of life more readily than the child who is able to hear for he truly must rely heavily on what is seen to aid in his abilities to communicate. Much that is seen by those in the "hearing world" is so taken for granted that it is probably not really "seen" at all. How much more joyous will be the life of a deaf child during the process of his education if the architecture which surrounds him meets his daily visual needs. This particular visual need will act as the backbone of this design thesis. The general approach then will be that as seen primarily through the eyes of an artist.

The problem develops into a solution of maximum reality with the attempt of theoretically locating the school on an actual site in an area of New England that has been found to be lacking in adequate facilities of this sort.

< HISTORIC INFORMATION

The history of the education of the deaf turns out to be an interesting field of study and one that actually encompasses so many facts and figures that it would only result in an inadequacy to try to elaborate on any particular phase of it or to attempt to give a complete review of the picture. Nevertheless, a few points of interest might well be brought out to reveal that the education of the deaf has not been one hundred per cent ignored over the ages. In spite of the following information, showing how far back some attempts were made in this field, it has only been quite recently that real progress has been made.

Table 1¹ on the next page reveals the activities of certain major countries as of the year 1852 in the field of educating the deaf.

1. ENGLAND. The earliest notice of any attempt to instruct the deaf and dumb in England is recorded as a miracle, an instance of the successful instruction of a deaf mute in articulation by John, Bishop of Hagulstad, about the year 600, by causing a person who was never able to speak so much as one word to repeat letters, syllables, and even words and sentences after him.

The first actual teacher of the deaf in England was a Dr. John Wallis, Professor of Mathematics at Oxford University, 1653. He not only corrected stammering or otherwise defective articulation, but instructed two deaf mutes to articulate distinctly, also teaching them to understand the meaning of language and to use it in speaking, reading and writing. In

¹"Tribute to Gallaudet" by Henry Barnard, 1852, pp 92.

TABLE 1.

ACTIVITIES OF CERTAIN MAJOR COUNTRIES AS OF THE YEAR 1852
IN THE FIELD OF EDUCATING THE DEAF.

'Country	No.	Date Founded	Country	No.	Date Founded
ENGLAND	3	1792	OTHER GERMAN STATES	20	1778
SCOTLAND	3	1810	GERMAN FREE CITIES	4	1827
IRELAND	3	1816	BELGIUM	4	1820
CANADA	1	1850	PORTUGAL	1	--
FRANCE	44	1760	SPAIN	1	1790
ITALY	9	1789	HOLLAND	4	1790
SWITZERLAND	10	1810	DENMARK	2	1799
AUSTRIA	9	1779	NORWAY	1	1824
PRUSSIA	25	1778	SWEDEN	1	1800
BAVARIA	10	1778	RUSSIA	1	1800
WIRTEMBERG & BADEN	7	1807	POLAND	1	1817
SAXONY	4	1772	UNITED STATES	14	1817

1760, a century having passed with little more accomplished, Thomas Braidwood of Scotland opened a school with one pupil. This school was to become the model of all early institutions for the deaf in Great Britain. Finally, in 1792 the London Asylum for the Support and Education of Indigent Deaf and Dumb Children was founded.

2. FRANCE. Much of the early progress is credited to the Abbé de l'Epée for as early as 1754 he had recognized the plight of the deaf and had begun familiarizing himself with the existing sign language already in use by the deaf. By correcting, enlarging and methodizing this language he soon developed it into a perfect form of communication for the deaf. Following his death in 1789 the Abbé Sicard took his place and gained an almost equal fame through his successful efforts to solidify the gains made by de l'Epée.

3. SPAIN. The first successful undertaking of regular instruction of the deaf in Spain was by a Pedro Ponce de Leon and a document of his relates, "I have had pupils who were deaf from birth, children of great nobles and of distinction whom I have taught to speak, to read, to write and to keep accounts.....some I have taught Latin, to others the Latin and Greek and to understand Italian. They were even skilled in political science and in other branches of knowledge of which Aristotle believed this class of persons incapable."²

After a lapse of nearly a century, the first school in Spain was started by Alea, a disciple of de l'Epée of France, at Madrid, 1798. By the year 1852 this school was still the only one in operation in the country where the art had its origin.

²"Tribute to Gallaudet" by Henry Barnard, pp 79.

4. ITALY. Again the prominence of de l'Épée comes to light for the first school was established in Rome in 1784 by another of his disciples, the Abbé Sylvestri. A second school was begun in 1801 in Genoa by Assarrotti who formed a system of instruction based on the writings of Sicard, but having alterations and decided improvements.

5. GERMANY. Samuel Heinicke in 1754 began instructing the deaf and by 1772 had already been able to lay the foundation for Germany's first school of this kind. This school was unique in respect to the fact that it was the first to gain support by any civil government.

This gives a brief account of the development going on in Europe at the turn of the nineteenth century. The methods then being employed, as progressive and as practiced as they were, still remained virtually unknown here in America. It remained for Thomas Gallaudet to become the leader and greatest promoter of the cause for the education of the deaf here in the United States. In 1815 Gallaudet made an inspection tour of the major institutions of Europe, becoming acquainted with the already mentioned Abbé Sicard and his methods of instruction.

"Mr. Gallaudet has combined the fundamental principle of Heinicke - 'First ideas, then, words' - with that of de l'Épée - that 'the natural language of signs must be elevated to as high a degree of excellence as possible, in order to serve as the medium for giving the ideas clearly and explaining them accurately.'"³

On April 15, 1817 the first school for the deaf was established in Hartford, Connecticut, under the guidance of Thomas Gallaudet.

³"Tribute to Gallaudet" by Henry Barnard, pp. 90.

In April, 1864 an act of Congress was passed, authorizing the National Deaf-Mute College in Washington, D. C., to confer collegiate degrees and in 1894 the name was changed to Gallaudet College in honor of Thomas Hopkins Gallaudet, the founder of the education of the deaf in the United States.

Today there are 301 schools in the United States, embracing public day, public residential, and private and denominational schools. Statistics as of October 1952 show that 17,482 deaf children and 3,438 hard of hearing children were being educated in schools for the deaf. Estimates as of 1950 show that there were approximately 170,000 totally deaf persons.

It is interesting to see the rapid increase in the various educational facilities for the deaf. In 1900 there were 57 public residential schools, 44 public day schools, and 14 denominational and private schools, with a total of 10,608 pupils. By 1950 public residential had climbed to a total of 74, public day schools to 158, and there were 45 denominational and private schools, a total of 20,496 students enrolled.

"The value of preschool education of the deaf was recognized by a few educators as far back as 1876, but it is only within the past decade that the number of preschool classes has increased to the point where parents of acoustically handicapped children can be referred to any one of 203 classes in the United States which accept children five years or younger,"⁴

"An ever-growing service to the hard of hearing is the establishment of speech and hearing clinics, hearing aid bureaus and other centers. . . offering some or all of the following aids to better hearing and better

⁴A reprint from the "Social Work Year Book '54"

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understanding: hearing tests, demonstration of hearing aids, help in the
selection of a hearing device, instruction in lipreading, speech correction
and auditory training. There are now 111 such centers in the United States."⁵

⁵A reprint from the "Social Work Year Book '54"

CHRONOLOGICAL LISTING OF FIELD TRIPS

Because of the lack of sufficient information in our libraries concerning the design and other physical aspects which a school for deaf children would require, it was found to be necessary to resort to considerable correspondence throughout the country in quest of this information. After delving lightly into the matter, it was quickly realized that not only was it necessary to search elsewhere to find literary assistance, but that it was of paramount importance to actually visit various schools for deaf children throughout the New England area.

What follows is a chronological listing of the various schools and professional people that were visited in the earlier stages of the research:

1. March 31 - Dr. Adam J. Sortini, Director of the Hearing Clinic, The Children's Medical Center, Boston, Massachusetts. The first visit was paid to Dr. Sortini in hopes of gaining an initial insight into the field of the education of the deaf. I found enthusiasm and a great willingness to cooperate. During this first visit Dr. Sortini revealed many interesting facts that convinced me that this topic would be a beneficial one to investigate.
2. April 5 - A second visit at the request of Dr. Sortini brought out the fact that in general the New England area is quite active in the education of the deaf but that perhaps Vermont and New Hampshire were the likely areas to be investigated in terms of not having adequate facilities.
3. April 20 - Visited the Thesis Committee

4. May 12 - Mr. Nathan P. Harris, Horace Mann School for the Deaf, Roxbury, Massachusetts. The Horace Mann School is perhaps the largest day school in this section of New England. A complete morning was spent in surveying the school. It is complete in every way in terms of having adequate facilities for teaching all subjects through the twelfth grade to about 125 pupils within a 25-mile radius.
5. May 16 - Sister Mary Carl, C. S. J., Randolph, Massachusetts. Known as the Boston School, it is a residential school having about 187 pupils and again is equipped to teach all subjects through the twelfth grade. In contrast to the Horace Mann School, this school, in spite of its institutional appearance, has a more favorable setting, having many acres of ground surrounding it.
6. May 18 & 19 - Dr. Leonard L. Elstad, Gallaudet College, Washington, D. C. This trip was the most impressive of all journeys made. My wife accompanied me to visit the only college for deaf students in the world located in Washington, D. C. and we spent a day and a half there. Dr. Elstad was most cordial and was the first to reveal to me that in the field of the education of the deaf there exist two opinions or approaches to the teaching methods used. I hope to discuss this further in this report. Gallaudet College has students from all over the world studying in all fields and also prepares students to become teachers of the deaf. On the same campus is the Kendall School for younger children from the ages of five through sixteen and it is complete as a residential school. Some of these students can go directly into the college upon completion of their high school studies. The principal of the Kendall School, Mr. Joseph P. Youngs, cautioned us as to the various pitfalls, the

"Do's and Don'ts" in putting together a new school for deaf children and acted as guide through the school for us.

The highlight of our visit to Gallaudet was meeting and then being shown about the campus by Gallaudet's public relation's man, Mr. Sternberg, who was completely deaf. This was a great help to us for we became totally aware of the actual problems of communication between individuals.

It is interesting to note that Gallaudet College began in 1864. Apparently, almost all building on the campus was completed near the turn of the century and only now are they able to anticipate a new building program to adjust to a program of educational expansion.

7. June 10 - Mrs. Francis P. Fitzgerald, Crotchet Mountain Foundation, Manchester, New Hampshire. Following up earlier correspondence with Mrs. Fitzgerald, it was decided to locate a facility for the education of the deaf in New Hampshire for the state had neither a day school or residential school. A visit with Mrs. Fitzgerald verified the fact that New Hampshire was without immediate facilities but that a school was to be started in Greenfield, New Hampshire, using some existing rooms of the new Crotched Mountain Rehabilitation Center located there. Preliminary thinking at this time was already fostering the idea of locating the project in Manchester, and so the immediate area was investigated for possible site locations.
8. June 13 - On the advice of Dr. Samuel Kirkwood, Commissioner of Health, State of Massachusetts, an interview was held with Dr. Rice at the Child Welfare Department in Boston, but Dr. Rice believed that Dr. Phillip Johnson would be of greater assistance, since the latter was in closer contact with the various building programs

throughout the state.

9. June 15 - An appointment with the Thesis Committee, through error, did not materialize. The important question at the time concerned the selection of site location, but a few words with Professor Andersen at the time permitted enough license to choose a site, even without an actual building program on the part of the State of New Hampshire.
10. June 19 - Revisited the Manchester, New Hampshire area and through certain topographical and other considerations a site was selected.
11. June 20 - Dr. Phillip Johnson, Child Welfare Department, Boston. This interview proved beneficial for Dr. Johnson believed that on the basis of the research completed thus far for the thesis, a one sided attitude as to the teaching and housing methods would be had unless a visit was made to the Clarke School in Northampton, Mass.
12. June 23 - Dr. E. B. Boatner, American School, Hartford, Connecticut. This visit was for the strict purpose of seeing the new preschool nursery building that would be ready to open this coming fall. It is designed to care for 51 children, ages three to six, and is a complete unit in itself apart from the rest of the school though on the same campus. This was probably the only opportunity to scrutinize a new physical concept for both the schooling and housing of deaf children.
13. June 23 - Dr. George T. Pratt, Clarke School, Northampton, Mass. Following Dr. Johnson's recommendation, after spending the morning at the American School, the afternoon was spent touring the Clarke School with Dr. Pratt. This particular interview was perhaps the most influential and impressive in that in many ways certain attitudes were now assumed that would play an important part in the

development of the thesis. In general, the physical disposition of the Clarke School differs with all the other schools (except perhaps Gallaudet, but it's a college) in that it is housed in a multitude of buildings, small units - groups, rather than in one assembly-line bulk basis. The Clarke School does not possess an institutional appearance but retains its residential flavor.

14. June 25 - South Shore Speech and Hearing Center, Quincy, Mass. This was the last visit to be made and since a small "Day Preschool Nursery" had not been seen, this last journey was believed to be necessary to complete the total picture. As in most cases of this sort this school was probably typical in that it was conceived to facilitate the immediate area and was as yet unable to claim any housing of its own. The most impressive thing to be remembered whenever the younger children were involved was the plea for "space and lots of it".

CONCLUSION: The primary purpose for journeying from one type of school to another was to discover just how a school for deaf children differed from any other school for children. Except for certain differences, perhaps not even noticeable at first, the professional attitude proclaims a strong desire to keep the schools as "un-unique" as possible. It was felt that to be as "normal" as possible was to their educational advantage. As anticipated, most schools visited, with the exception of the new preschool nursery at West Hartford, Connecticut and the Clarke School, bore obvious signs of architectural neglect as the various photographs will bear out. Most of them were "institutions" with all of the associations that go with the word. Dark hallways, uninteresting spaces and a prevailing atmosphere of confinement were the outstanding characteristics.



Horace Mann School

Roxbury, Mass.



Boston School

Randolph, Mass.



New Pre-School Nursery Unit
American School
West Hartford, Conn.



New Pre-School Nursery Unit
American School
West Hartford, Conn.



Gallaudet College
(portion)
Washington, D.C.



Kendall School
Gallaudet College
Washington, D.C.



Rehabilitation Center

Manchester, N.H.



Clarke School

(portion)

Northampton, Mass.

LOCATION OF PROJECT

The State of New Hampshire was an early and constant consideration for the location of the school for deaf children. In my second interview with Dr. Sortini at the Children's Medical Center I was immediately supplied with facts and figures disclosing that this state, above all others in the New England area, was in the greatest need for either a day school or residential school, or both, to handle the education of its own deaf children. At the present time New Hampshire relies on the facilities of neighboring states to accommodate an educational requirement that should and could be met at home. Throughout the state those children who require special attention and aid in their education find themselves at the mercy of time, distance and a lack in numbers of those people who can give good professional assistance to them. Because of the distances between the various needy children, it is virtually impossible for the "roving" educators to appear on the scene enough hours per month to really produce progressive results. Theirs is but a holding action.

The yearly state appropriation for the education of the deaf has been cut from an already low figure of \$60,000 to \$50,000. The state has at the present time about fifty-four (54) children attending out-of-state schools and pays \$1300 per student. There are eight (8) children in the City of Manchester alone in need of special assistance with another sixteen (16) children throughout other parts of the state in need.

Over the years these figures no doubt fluctuate but, according to these figures, there are now roughly seventy-eight (78) children to be considered. Nothing prevents this total from going higher - it is unlikely

to go lower.

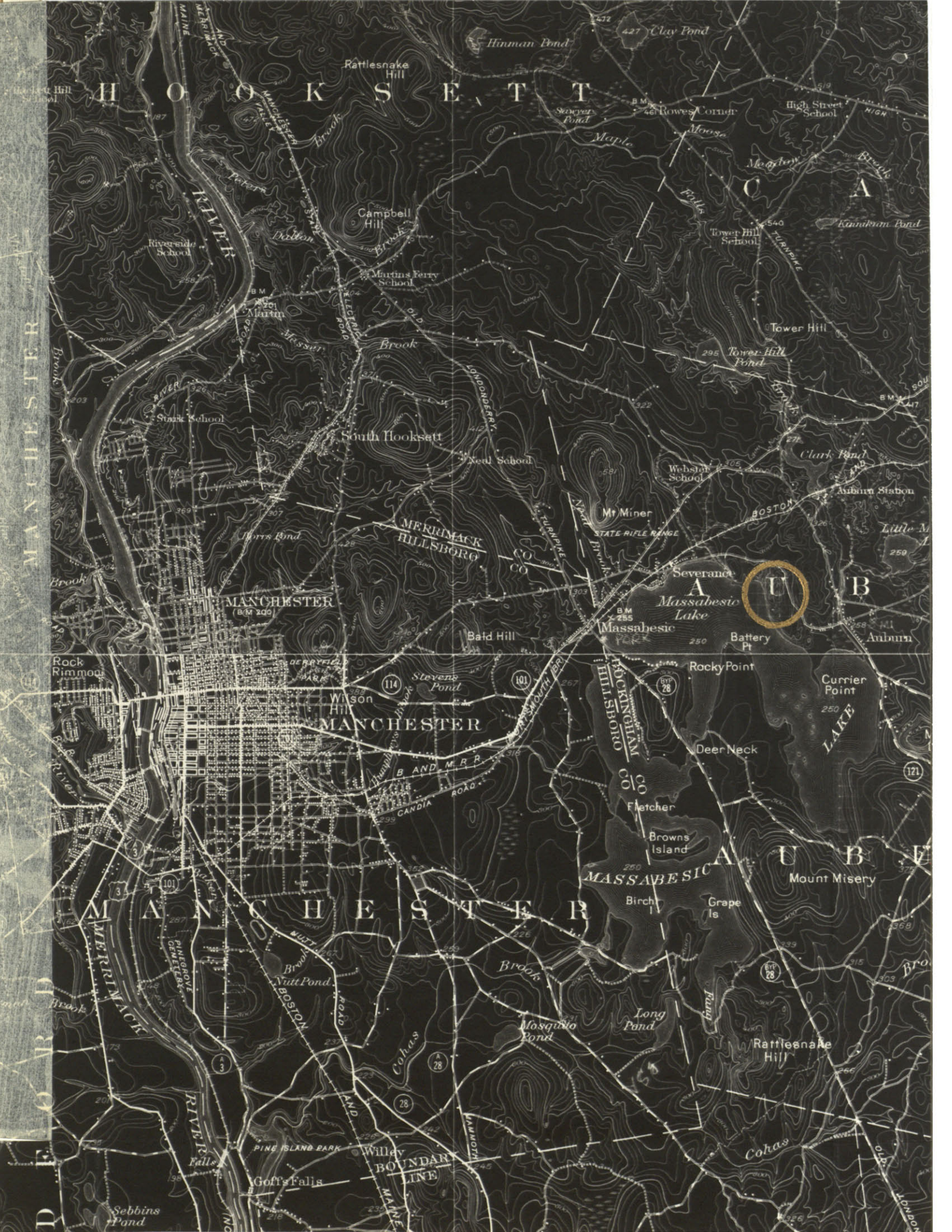
This fall a project will go into effect in the form of an experiment at the Crotched Mountain Rehabilitation Center, Greenfield, New Hampshire. Approximately eighteen (18) acoustically handicapped children will take over several existing rooms and there will then exist a beginning school for deaf children.

Based on the above facts and figures and on the various trips made viewing different schools it would seem that a more desirable approach to starting a school for deaf children would be to find the area of the state that harbors the largest and most immediate volume of eligible children for such a school and just as important to design a new unit as an entity in itself rather than to carve an inadequate niche in an institution that, perhaps, is best suited for other types of rehabilitation.

Considering that Manchester, itself, has eight handicapped children and that it is the largest city in the state and possesses a central location (in relation to the overall population of the state), it appears that a school for deaf children might easily thrive in or near this city.

On the first trip to Manchester a preliminary investigation of the site possibilities was made. Various locations in and near the city itself were surveyed, taking into consideration the accessibility in terms of mileage to the city, but just as important, attempting to find an area that possessed topographical expression, a place beautiful in itself. Several miles to the east of Manchester is Massabesic Lake, and here a tentative site was chosen. After further research was made and the entire

lake area considered, a second field trip was necessary to either verify or condemn the first site chosen. For two reasons a second choice was made. By the second decision the location of the school was shortened in mileage from Manchester from eleven (11) miles to about six (6) and a plot of ground far more expressive and conducive to the type of seclusive atmosphere that is desirable for a school of this sort was found. On a site of this caliber, already rich in sculptural beauty, all of the spontaneous qualities inherent in a child can be better realized. This location is readily accessible by good roads from the City of Manchester and from other directions in the state.



H O O K S E T T

M A N C H E S T E R

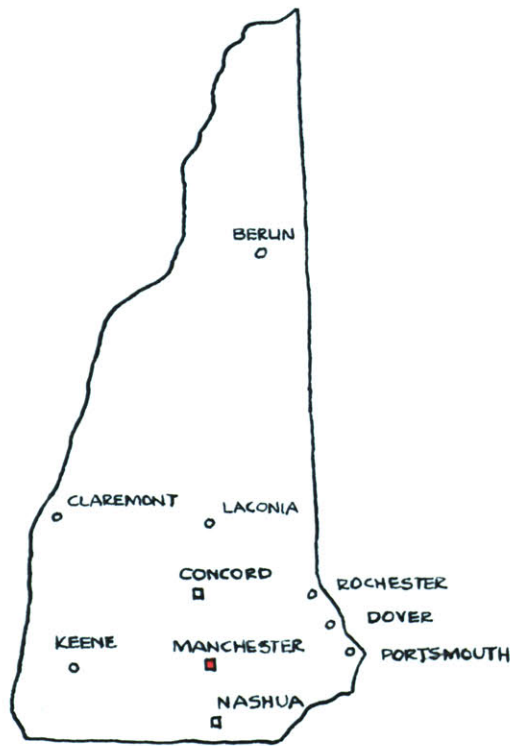
M A N C H E S T E R

M A N C H E S T E R





VIEW OF MASSABESIC LAKE FROM SITE





PHYSICAL CHARACTER OF SITE



DESIGN PROGRAM

As mentioned earlier in this report, the visit to the Clarke School in Northampton, Massachusetts, played an important part in the final development of the general design program outline. Using this outline, a School for Deaf Children was designed.

Because of the fact that the Manchester, New Hampshire, area does not have a large populoussness of acoustically handicapped children, nor is there any great gathering of such in any other part of the state, it was believed desirable to set up a program that would lead to a residential school rather than a very small day school. The general attitude and approach as carried out in the Clarke School seemed most logical and appeared to meet the day to day requirements of the deaf child to a more satisfying degree than any other school visited.

This design thesis in many ways patterns itself after the processes found at the Clarke School. Dr. G. Pratt pointed out innumerable factors to be strongly considered. Three factors that helped to dictate the general approach from a functional standpoint were, first, that the school curriculum should carry up to and including work comparable to that of the eighth grade in a hearing school. By teaching the deaf student just a little more than eighth grade work, he is better able to adjust to the studies as offered in the hearing school - his first term's work in the new school is often a fine success. He is given then an immediate taste of success upon which to build the early and necessary confidence that he needs. The second factor lay in the belief that the school compus should be loosely conceived of many small component parts making up the whole,

that each major age group should be self sufficient in itself in terms of classrooms and housing facilities. The attitude of smaller parts making up the whole seemed to justify itself when it was considered highly desirable to create an atmosphere of warmth and intimacy to make the place feel as much "like home" as possible, and to avoid the institutional appearance. The third factor was one of the most interesting for it was one not likely to be thought of as being practical without having an opportunity to witness its success. The Clarke School urges a program for the deaf child of constant immersion in a talking world. As we all realize, it is much easier to learn any topic when we are continually confronted with all aspects of it at all times. Hence, the deaf child is, as much as possible, "bathed" in a verbal existence by a unique housing approach and one by which this thesis is greatly influenced.

As mentioned, the children are divided into smaller groups according to proper ages and are housed as such together with their teachers, matron, house supervisors, maids and cook. No matter where the deaf child goes, he is likely to be in some contact with a hearing-speaking person.

Contrary to the usual accepted idea of finding many students in a hearing classroom, it is of the utmost importance to limit the number of deaf students. It was learned that the most desirable number was as low as five (5), but that one teacher could handle, if necessary, a total of eight (8) without forfeiting effective results. Probably the most prominent difference between a "deaf classroom" and a "hearing classroom" was this factor of a small amount of students but with the same size or even larger classroom.

In the case of the installation of a nursery, together with its living quarters, on the same campus with the rest of the school, it was believed a necessary step to take in view of the fact that the earliest stages of a deaf child's receptivity must be taken advantage of for it is during the ages of about three and four that the awareness of a verbal communication between individuals must be made clear to the child. Here it is necessary to have two (2) teachers to handle from between six (6) to perhaps ten (10) children. The housing for these children is within easy walking distance to the nursery and easy access to the little dining room which operates in conjunction with the primary dining room and kitchen.

The primary housing is divided into two identical units for children of the age groups five to eight in one house and eight to eleven in the other. Each house functions by itself in terms of living quarters for both children and staff, plus having its own dining and kitchen and recreation rooms.

The primary classrooms are but a short journey from the living quarters and are designed to try to meet the fun loving needs of younger children. It was believed wise to split the classrooms into two forms, as there are two housing units. This tends to lead the child's development from more carefree and playful surroundings to finally a more serious and perhaps restricted concept in the intermediate section of the campus. In the lower classrooms it is required to provide small cubicles for special auditory classroom teaching, with another for parental observation. These are equipped with one-way glass.

During the visit to Gallaudet College a visit was made to the audiology clinic on the campus. Dr. Elizabeth Van Loven expressed an opinion

that it was most advantageous to include, if possible, good audiological facilities on any new campus of large enough size. In this particular instance it was felt that these facilities could serve not only the immediate campus but could service the entire section of the State of New Hampshire near Manchester for those people, both young and old, who might require instruction or aid of some kind. Thus, a small clinic has been included with a staff (not living on campus) of about ten (10).

The project is primarily divided into two groups - primary and intermediate. The seniors, as mentioned, continue their schooling if possible in hearing schools.

For this reason it is believed that the school can be constructed in terms of a staging program. In other words, first things first, followed by what is needed later. With this in mind perhaps the most pressing requirement would be the audiology clinic which could be ^{IN} used ~~in~~ the process of screening prospective children to attend the forthcoming nursery and primary sections of the school. Lastly, of course, would come the intermediate sections. For the most part there would eventually be campus housing for much of the administrative staff and intermediate instructors.

Because of the minimum and maximum enrollment requirements, the school will handle from fifty-six (56) to seventy-four (74) students.

ORAL OR MANUAL METHOD?

It's not too surprising to find several camps of thinking in almost every field of professional and scientific endeavor. In these times it is a common thing to find conflicts in terms of attitudes and approaches among the top men and women in each category of educational and scientific research. So, too, in the field of the education of the deaf there appears to exist, broadly speaking, two beliefs as to the correct or most progressive attitude to assume in teaching the deaf to communicate both among themselves and with those of the hearing world.

The intention here is not to expound on the subject, for it would engross quite a discourse in itself, but rather to bring out the fact that such feelings do exist in every day conflict in this particular field.

The belief that the deaf can benefit most by being educated through mediums and by tools closely allied with those offered to people in a hearing society then tends to eliminate, to a large degree, the extensive use of any sign language. It's felt that to offer an education and hope for good communication between the deaf and those who hear through any other method than that of the oral method would only bring about the defeat of the entire purpose of a program of education - that of communication with the hearing world.

The other camp holds strongly to the belief that the deaf tend to flock by themselves no matter what efforts are made to break down the barrier between the deaf and the hearing and that since this seems to be true, then a complete system of sign language must be permitted between them.

As mentioned in the Design Program, this thesis, after extensive research, is developed along the thinking of the first camp - that of integrating with a hearing society.

MODERN HEARING AID EQUIPMENT IN SCHOOLS FOR THE DEAF

By C. V. HUDGINS

THE group hearing aid is playing an increasingly important role in the educational program of schools for the deaf. It is no longer true that hearing aids are reserved for the relatively small percentage of pupils that may be considered hard of hearing or partially deaf. On the contrary, evidence is rapidly accumulating that shows that an entire school population with very few exceptions may benefit from an acoustic training program. This training should begin with the youngest primary classes, and continue progressively throughout the entire school. The response to acoustic training, and hence the amount of benefit derived from group aids, will vary to some degree with the amount of hearing loss. But practically every child will receive some help from a properly administered acoustic training program. The group hearing aid does not introduce a radically different method of teaching. It is merely a teaching aid that may be used to supplement proven methods.

The First Step

The first essential for such a program is the installation of modern group hearing aids in every classroom that will be used by academic classes. There are available at present a number of good commercial instruments that meet our requirements. They differ mainly in the amount of supplementary equipment provided such as turntables, loudspeakers, radio receivers, etc., in addition to the basic equipment. Dr. Silverman, of Central Institute for the Deaf, has ably discussed the technical details of acoustic training in a recent paper read before the Twentieth Meeting of the Conference of Executives of American Schools for the Deaf. His paper was published in the *American Annals of the Deaf*, 1949, Vol. 94, pp 325-339, under the title, "The Implications for Schools for the Deaf of Recent Research on Hearing Aids." For those interested in a thorough technical coverage this paper is highly recommended.

The purpose of this paper is to present some practical suggestions that may be

helpful in setting up the physical equipment essential in the implementation of the modern acoustic training program.

Special Classroom and Equipment

A modern acoustic training program requires special equipment and specially equipped classrooms. After considerable experience we at Clarke School for the Deaf have settled upon what we consider a practical setup, well adapted to the needs of our children and teachers. The following items cover what we consider the basic requirements.

Classrooms should be relatively large, at least 18 x 22 feet; the ceilings and wall spaces should be covered with acoustic tile, and the floors covered with a heavy rug at least 15 x 18 feet. The purpose of acoustic tile is to reduce to a minimum room reverberation. This increases the fidelity of the speech signals, reduces background noise, and frees the teacher from the necessity of speaking directly into the microphone. The function of the rug is twofold. It further reduces room reverberation and at the same time muffles foot noises within the room.

Wiring needs, insofar as hearing equipment is concerned, consist of adequate wall outlets for plugging in the hearing aid. In my opinion, under no circumstances should the wiring for the hearing aid equipment itself be permanently installed in the floors or in the walls of the room. In the first place, it is extremely difficult to service such circuits in case of trouble without ripping up the masonry. In the second place, it is desirable to maintain a high degree of flexibility with respect to placement of desks, microphones, amplifiers, and lead wires from the amplifier to the desk. We find that the lead wires may be placed on the floor in an area of least traffic or they may be carried overhead on supporting wires. In case of the former method the children very soon learn to avoid them.

Flexible Arrangement

In the group hearing aid setup the individual earphone outlets are attached to the desk, and the desks connected by short patch-cords. The desks are not fastened to the floor but may be arranged in any order according to the demands of the occasion. A close semi-circle about the teacher's desk is the most practical arrangement for most teaching needs. As to the hearing aid equipment itself, the essential thing is an amplifier with an output of 8-12 watts with a flat frequency response up to 10,000 cps, and compression amplification or some other power limiting device. This will provide ample power for operating ten pairs of dynamic earphones and at the same time protect children's ears against painfully intense sounds.

The younger primary children prefer earphones of the insert type, fitted to individually molded ear inserts. These are lighter and more comfortable. Older pupils should have the larger standard size earphones, preferably the dynamic type. In either case two earphones for each pupil are essential. Two microphones are usually desirable unless the room is very small. One should be suspended over the semi-circle of desks, the other immediately above the teacher's desk. Where two microphones are used the amplifier should have two independent input channels with independent control attenuators and a jack for a record player.

The individual outlet boxes for the earphones should be attached to the desks and equipped with attenuators (volume controls) so that each pupil can control the amount of energy in his own earphones. An outlet at the blackboard is also very useful, especially for the primary grades where a considerable portion of speech teaching is carried on with individual pupils. Some of the group hearing aids now available are equipped with two independent volume controls that permit the

adjustment of the speech level separately for each ear. The purpose of this arrangement is to enable the child who may have different degrees of loss in the two ears to balance the loudness of the sounds. The value of this feature is debatable. It is probably useful for hard of hearing children in cases where differences between the two ears exist. I am not convinced of the necessity for this type of individual control, however, as standard equipment. In the first place, young children are probably not capable of making the correct loudness balance; and in the second place, profoundly deaf children usually must rely upon their better ear in any case even when a difference does exist. Furthermore, profoundly deaf children will need to keep the volume controls at maximum or near maximum levels in order to obtain maximum benefits. Finally, the extra volume controls and the essential extra wiring adds to the maintenance problem.

Expected Results

The primary purpose of group hearing aids is to stimulate and to render functional the small remnants of hearing found in most deaf children. Early training is essential and the results vary widely. Many of these children may never be able to develop speech perception ability by ear alone, regardless of the type of hearing aid employed. Encouraging results are available, however, which show clearly that speech perception is improved when lipreading and hearing are combined. Speech intelligibility is also improved in the process. Thus the group hearing aid and an acoustic training program improve both aspects of the process of communication, which in turn enrich the quality of the general education. Finally, deaf children who are brought up under an enlightened acoustic training program successfully wear individual hearing aids and thus continue to benefit from the training experience.

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