

NATIONAL EDUCATIONAL ASSOCIATION

PROCEEDINGS

OF THE

Department of Special Education

IN THE ANNUAL CONVENTION AT

St. Louis, Mo.

JUNE 27-JULY 1, 1904



REPRINTED FROM THE ST. LOUIS VOLUME OF PROCEEDINGS

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MINN., JULY 1, 1904

PROCEEDINGS OF THE NATIONAL TEACHERS' ASSOCIATION

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1861	(No meeting)	-	-	-	-	-	-	-	-	-	-	-	-
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1863	Chicago	-	-	-	-	-	-	-	-	-	-	*	*
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1878	(No meeting)	-	-	-	-	-	-	-	-	-	-		
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1887	Chicago	-	-	-	-	-	-	-	-	-	-	1.50	1.75
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1897	Milwaukee	-	-	-	-	-	-	-	-	-	-	1.75	2.00
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1899	Los Angeles	-	-	-	-	-	-	-	-	-	-	1.75	2.00
1900	Charleston	-	-	-	-	-	-	-	-	-	-	1.75	2.00
1901	Detroit	-	-	-	-	-	-	-	-	-	-	1.75	2.00
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DEPARTMENT OF SPECIAL EDUCATION

SECRETARY'S MINUTES

FIRST SESSION.—WEDNESDAY, JUNE 29, 1904

The sessions of the department were held in the Assembly Hall of the Mines and Metallurgy Building of the Universal Exposition. The department was called to order by President J. W. Jones, superintendent of the Ohio State Institution for the Deaf, Columbus, O.

The following program was carried out:

- I. President's address, by J. W. Jones, superintendent of the Ohio Institution for the Deaf, Columbus, Ohio.
- II. "What Teachers May Learn from the Model Schools of the Deaf and Blind and Their Exhibits," by S. M. Green, superintendent of the Missouri School for the Blind, St. Louis, Mo.
- III. "Sight and Hearing in Relation to Education," by Oscar Chrisman, professor of paidology, Ohio University, Athens, O.

Informal discussion followed by Dr. D. P. MacMillan, director of the Child Study Department of Chicago Public Schools, and R. C. Spencer, president of the Wisconsin Phonological Institute, Milwaukee, Wis.

The president appointed as Committee on Nominations:

- | | |
|---------------------------------|----------------------------------|
| Mary R. Campbell, Chicago, Ill. | Percival Hall, Washington, D. C. |
| S. M. Green, St. Louis, Mo. | |

SECOND SESSION.—FRIDAY, JULY 30

The department met at 2:30 P. M., and was called to order by President Jones. The following was the program of the session:

- I. Report of the Committee on Statistics of Defective Sight and Hearing of Public-School Children, by Percival Hall, professor of applied mathematics and pedagogy, Gallaudet College, Washington, D. C.
- II. "The Chicago Hospital School for Nervous and Delicate Children—Its Educational and Scientific Methods," by Miss Mary R. Campbell, secretary of board of trustees and educational advisor for the Chicago School of Special Education, Chicago, Ill.
- III. "The Teacher and the Defective Child," by Dr. M. A. Goldstein, editor of *The Laryngoscope*, St. Louis, Mo.

Officers for the ensuing year were elected as follows:

- For *President*—Miss Margaret Bancroft, head of Haddonfield Training School, New Jersey.
For *Vice-President*—J. H. Freeman, superintendent of the Illinois School for the Blind, Jacksonville, Ill.
For *Secretary*—Miss Anna E. Schaffer, state supervisor of schools for the deaf Wisconsin.

The department then adjourned.

ELIZABETH VAN ADESTINE, *Secretary*.

PAPERS AND DISCUSSIONS

PRESIDENTIAL ADDRESS

J. W. JONES, SUPERINTENDENT OF THE OHIO INSTITUTION FOR THE DEAF,
COLUMBUS, O.

I wish to express my appreciation of the honor conferred upon me by my election to the presidency of this department. Special education has its place in our great school system, and it is right and proper that those engaged in it should meet for exchange of ideas. By "special education" we mean the education of special classes, usually known as defectives, such as the deaf, blind, feeble-minded, and those both deaf and blind; rather than the education of the normal child in special subjects.

Our work, then—what is it? How are we progressing as compared with teachers in the ordinary schools? Our pupils—what of their gain as compared with what it would be in the ordinary school, and what is the organization of our schools as compared with the organization in ordinary schools? These are all interesting questions.

Schools for special education are for the most part state or city schools, whose pupils are generally surrendered by parents for the term, and whose conduct in and out of school is supervised by the teachers of the school. The child's life at once becomes systematic and regular, with wholesome food, sufficient play, an abundance of sleep, diversified work, regular study, and punctual attendance in school. These advantages are not fully recognized and appreciated by educators. It is impossible to secure them in ordinary schools, where children are responsible to their parents out of school hours. To one who has had experience in watching results in special schools, where the management controls in and out of school, the advantages seem so superior as to make him wonder if the question is not of sufficient importance to engage the attention of educators generally. In special schools also is found a much greater variety of instruction than in ordinary schools. In addition to a varied curriculum of studies are found all kinds of manual and industrial training, a complete art school, a gymnasium, instruction in domestic science, fancy needlework, music when the pupils can hear, trade schools, and specialties of almost all kinds, where few or many pupils are taught to be useful and self-supporting. The sense of which the children in these schools is bereft is compensated for, in a measure, by the varied opportunities to develop the remaining senses.

The manual training affords a wonderful help to these children in both their physical and mental development. They return to their homes for vacation, and parents note the ease with which they can turn their hands to doing things. This is especially true of the deaf children. It is not an uncom-

mon thing for parents to say that their deaf child is more useful and helpful than any of their other children. Children from special schools usually go back to their homes better housekeepers, have more modern ideas, and exert an influence for better things. From this we conclude that the state could afford to do more in the ordinary schools to train the hand and eye to work in unison with the mind. This will cost more money, but it will make more efficient men and women, and the state will have its return for the increased expenditure.

It is true that there is a larger percentage of objectionable children in our special schools, and that the average of intelligence is, even in the schools for the deaf and blind, not as high as is found in the ordinary schools, for the reason that the causes which destroy sight and hearing often affect the mentality as well. It is also true that when the sense only is affected the mind is quickened and intensified, the character becomes beautiful, and the disposition sweet. It is a joy to have such children as pupils. The deaf children are especially attractive and interesting. I am told by those who work with the blind that their perception is keen, their ideas are often original, and their memories are so strong that it is a pleasure to teach them.

It is not expected that the feeble-minded can be educated to a high standard; the fact of their mental weakness makes this impossible. Many, of course, cannot be educated at all. But, in proportion to the ability and expectancy, these unfortunate children are far better off in special schools than they could possibly be in the ordinary school or at home.

The work of educating the special classes is very important. One of the necessary conditions is their segregation. Under the plans adopted and methods pursued in all of our states and a few cities, we see the deaf and blind highly educated, sometimes in general knowledge, sometimes in special lines, but always to the point of usefulness. They do not become beggars, but become industrious and self-supporting citizens, able to maintain their families and to educate their children. When you see a deaf or blind person begging, you must not think he represents his class; for he is the rare exception, and in all probability was never in a special school. These habits are sometimes taught by indolent and thoughtless parents; but when the child goes to school he is too proud of his acquirements, when he returns to his home, to acknowledge in any way that he is not capable of taking care of himself.

There are many reasons why the pupil in special schools are proportionately better educated, considering their disadvantages, than are the children in the ordinary schools. We have already spoken of regular attendance, regular study, systematic living, diversified opportunities, manual and industrial training. Teachers are generally much more carefully selected, and their preparation and work are more carefully supervised than in ordinary schools. This is especially true in a state school, where the superintendent has the entire field from which to make his selections, and is free from local influences which often secure the appointment of incompetent persons as

teachers in the ordinary schools. The services of good teachers once secured, the tenure of appointment is almost certain, the remuneration is satisfactory, and the results are bound to be the best.

Teachers in the ordinary schools are always interested, surprised, and pleased when they visit the special schools. They are at once struck with the thoroness of the work done and the satisfactory results secured. They learn the value of simplicity and illustration. They see the full force of objective teaching. In the special school they see the object, the action, the thing done; and then they watch the mental process of the child to express in English what the eyes have seen and the mind has thought. It has taken time, but no energy has been lost; something has been done. They also find these special schools better equipped with working material, hand-made charts, useful pictures, supplementary books, and the like.

Not only in the detailed work of instruction do the special schools keep abreast of the times, but the work as a whole is aided by discoveries growing out of scientific, sanitary, economic, and sociological investigations. The attention of those interested in these discoveries is called to the papers to be presented in this meeting.

I desire to call your attention especially to the advanced step taken in the Ohio School for Feeble-Minded Youth for the care of the adults of this class. The able superintendent of that institution, Dr. G. A. Doren, who has had charge of the institution since its founding, nearly fifty years ago, has succeeded in having the state legislature provide a custodial farm of sufficient acreage to give employment to the adult feeble-minded of the state, and in such a way that the sexes are entirely separated, not only from each other, but from society at large. The prime object of this movement is to prevent the propagation of their own kind. As statistics show that the offspring of the feeble-minded is almost always imbecile, this is doubtless a great step toward lessening the percentage of this unfortunate class of people, and in time the expense of maintaining schools for such children may be lessened. But whether it be or not, the good of society is served by this segregation, and the welfare and happiness of the feeble-minded themselves are greatly increased.

The advanced work in speech and in lip-reading which the deaf schools are accomplishing, and the increased opportunities for the education of those who are both deaf and blind, as exemplified by Helen Keller, Tommy Stringer, Oren Benson, Leslie Oren, and many others, show the efforts that are being put forth by these special schools to better the condition of all classes and to restore to the light of the world those who would otherwise spend their lives in darkness and misery.

*WHAT TEACHERS MAY LEARN FROM THE MODEL SCHOOL
FOR THE DEAF AND BLIND, AND
THEIR EXHIBITS*

S. M. GREEN, SUPERINTENDENT MISSOURI SCHOOL FOR THE BLIND,
ST. LOUIS, MO.

In the advance in recent years of educational spirit and methods to the point where the whole child is considered, where his body is trained as well as his mind developed, where his social and ethical impulses are directed by a sound judgment, we approach the ideal training of the young citizen-to-be for the duties and relations of future citizen life.

In schools for special classes of pupils, such as the blind and deaf, this advance is of special beneficence, tho the problems encountered are not so easily solved as in schools for the normal child. Such training of faculties and powers as equip the child for self-support is for the defective classes a problem unsatisfactorily solved and subject to constant revision.

The teacher of the normal child, as he approaches the work of the deaf and the blind, may be greatly helped by observing the mental processes and intellectual tendencies of the two classes so handicapped in the acquisition of knowledge.

As by far the greater number of sense-percepts come thru the eye, the blind child has a much more narrow basis of knowledge than the deaf child, compares and classifies his percepts more frequently, knows what he knows more thoroly, and is more dogmatic in his expression of the truth so gained. He early becomes accustomed to a mental visualization of his percepts, which can be greatly utilized by the teacher in leading him to the unknown; for it is to this intuitive grasp of the idea, and its ready expression in language, so difficult for the deaf, that the blind child owes his intellectual life. "It is the soul that sees." It is then not surprising that, as the words come trippingly from his tongue, the blind child overrates his acquisition, while the deaf child, with his brain flooded with sense-percepts—gained thru the eye, usually lacking the concentration common to the blind, who have not these distractions—understands the thing seen and its relations, but does not always compare and classify, or pass to the abstract contemplation of the idea. With his brain a confused register of sense-impressions, he cannot translate his knowledge into terms intelligible to others, and becomes distrustful of his ability to apprehend the idea, which he is unable to clarify by expression in language.

The deaf child has the idea; the blind child, too often the sign of the idea. The beneficent results of developing the whole child, by the manual work and domestic-science occupations, are especially felt in schools for the blind and deaf. Limited as is each class in sense-activity, the wholesome effects are particularly felt by the blind child, who finds the outer world unfolding to him as successive, not simultaneous, acts of sense-perception, as in the

case with his deaf brother. His own activity makes the idea vivid. To put the sloyd hammer in his hands gives him a clear-cut idea of the tool itself; and to use it opens a new world of activity. If the first tendency in using be iconoclastic, it needs only direction to become constructive.

The making of the flower-stands, the picture-frames, the chairs, opens to him the joy of self-expression, and regarding those objects, at least, no more are his ideas formless and inaccurate. The blind girl, in sewing and using the utensils of cooking, has now the clear-cut idea made vivid by her own participation in the process of construction, and no longer the word, as the vague symbol of thought, is the sole fruit of her efforts. The joy of becoming a useful member of the family and sharing in the world's work transforms existence to a class hitherto assigned to the chimney corner. This training of the hand and the muscles awakens the motor center of the brain, and stimulates neighboring areas, producing more normal activity, which results in clearer and more sustained thinking power.

The deaf child, with its wealth of percepts gained thru the eye, is baffled in his attempts to use the symbols of thought, his ideas becoming vague from the inability to clothe them in fitting language, demonstrating to us how language does clarify thought.

Right here I would suggest that the great deficiency in the instruction of these two classes of pupils is the lack of nature study. The sense-perception of the blind may be greatly increased by introducing into the school more science study—not the dry formulas and theories, but the vital facts which they may classify and compare themselves. The blind child needs to go to the fields to know his neighbor birds and flowers, to gather the common plants and grains, to learn the size and varieties of animal life, to observe the variations of temperature, moisture, and direction of the wind from his own observation, not the hearsay of others.

To show that this can be done, I cite a class of blind pupils, of which five gathered, classified, and mounted 358 specimens of insects, the only aid given being that which was rendered by younger seeing children in catching specimens. One pupil, E. H., aged eighteen, analyzed and dissected plants and flowers, discovering all parts that could be seen without the aid of the microscope, by his sensitive fingertips. This work was done under the direction of an enthusiastic teacher, whose excursions with pupils to the country and morning trips to the park were intellectually stimulating and recreative. Who can estimate the value of the knowledge so gained in correcting and removing inaccurate ideas of plant and bird life? This abundance of material so gained can be used to develop power of expression for the deaf, training him into easier use of the symbols of thought.

The nature work will cultivate for the blind an exact habit of thought, which he needs to substitute for his irregular emotional mental habits. The blind pupil can accomplish the prescribed amount of culture studies—history, literature, civics, and ethics—in the same time as his seeing brother, but is

physically barred from laboratory and microscopic work, which the deaf may perform, while the culture studies supply the deficiencies noted in the sympathetic, emotional nature of many of the deaf.

From the written work of the exhibit, we find that one class of eight furnished 307 absolutely perfect papers in language and history in eight months, not one dot of which is out of place. The accuracy and neatness here displayed count for much in the daily life of the pupils, who have probably themselves received greater benefit from the exhibit than those who examine and admire.

From the pictorial exhibits, we find the play-life to be that of normal young people, as we see them playing games, giving physical-culture drills, entertaining by programs of musical and literary efforts, and entering into all the regular pleasures of youthful life.

In the matter of trades taught for self-support, the great problem of after-student life, the deaf outnumber the blind—about five to one—as there are so few occupations which can be followed by the blind without the help of seeing people. The broom trade is one, and is especially adapted to the Middle West, where the corn is grown. Piano-tuning is necessarily limited to those having a musical education. Musical talent, contrary to the popular idea, is not an invariable attendant of blindness.

In the courses of study, music, manual training, and art are offered to these two classes of pupils; the girl or boy without musical talent, or talent for drawing or painting, may find development in the manual training, and not be kept where progress is impossible and special talents are not recognized.

The girl who has not talent for music or other arts may find her greatest delight in domestic science, and in mastering the problems of the kitchen and the table.

The teacher who leaves this exhibit without feeling that there are many avenues to reach the child and further his development, and that his individuality should be studied and conserved, has missed much of its lessons.

The instructor of the seeing child is helped by his study of these schools to determine what variation his pupil makes from the normal pupil; whether he needs more observation work or more imagination culture; whether logical and reflective studies, or those with a social sympathetic basis, are required, that he may set to work to remedy or remove the deficiency; not to label the child stupid and to consider him hopeless.

SIGHT AND HEARING IN RELATION TO EDUCATION

OSCAR CHRISMAN, PROFESSOR OF PAIDODOGY, OHIO UNIVERSITY, ATHENS, O.

Perhaps the first examination of the sight of school children was made by Cohn at Breslau, Germany, in 1865, and of the hearing of school children by Reichard at Riga, Russia, in 1878. Since that time there have been quite

a large number of school children examined as to sight and hearing, and it has ever been found that a large percentage have defects of sight and hearing which greatly affect the work of the school. Notwithstanding the importance of these two senses in education, it is surprising to learn how little is being done to ascertain their condition among school children. The committee which was appointed by this Department of Special Education for the purpose of collecting data in regard to defective sight and hearing, in their report to you of last year, 1903, state that a special circular of inquiry was sent out in this country to the superintendents of schools in cities of more than 25,000 inhabitants. "The circular was sent to 160 superintendents, seventy-eight answers were received, but in nineteen cases only were any statistics reported." From this we are led to conclude that the number of schools in this country that are examining the sight and hearing of the children are very few. And yet every thinking man and woman today believes that there should be frequent physical examinations of school children, and many hold that every school should have a medical examiner connected with it. This is surely coming, and yet how slowly it comes! In this audience are people from different sections of this country. How many of you know of a single school where some kind of examinations or tests are not regularly held in the subjects taught? But do you know of a single school where examinations are regularly made of the eye and ear and nose and throat of children with tests of sight and hearing? Yet, which examinations are of most importance to the welfare of the child?

The medical people are becoming active in this matter and are doing much to bring about a change in this respect. At the meeting of the American Medical Association at New Orleans in May, 1903, thru the efforts of Dr. Frank Allport, of Chicago, the following was adopted:

WHEREAS, The value of perfect sight and hearing is not fully appreciated by educators, and neglect of the delicate organs of vision and hearing often leads to disease of these structures; therefore, be it

Resolved, That it is the sense of the American Medical Association that measures be taken by boards of health, boards of education, and school authorities, and, where possible legislation be secured, looking to the examination of the eyes and ears of all school children, that disease in its incipency may be discovered and corrected.

In reference to this resolution, Dr. Allport wrote me under date of May 26, 1904:

This resolution has already been adopted by the Mississippi Valley Medical Association, and the state medical associations of South Dakota, Michigan, Montana, Delaware, Minnesota, Colorado, New York, California, Alabama, Utah, Illinois, and Connecticut. The resolution has also been adopted by the American Public Health Association, and the state and provincial boards of health of North America. The following state boards of health have passed the resolution and are taking steps to put the plan in operation in the fall: North Dakota, Rhode Island, Alabama, Illinois, Montana, New York, Indiana, Connecticut, Minnesota, Kansas, Colorado, and Ohio. The state legislature of Connecticut has taken up the work, and children are examined in that state under the state law. The resolution has also been passed by the state boards of education of Texas, Kansas, Minnesota, and Colorado.

Civilization is laying great burdens upon the eye and the ear. In city life especially must the innumerable noises be very hard on the hearing apparatus of the young child, greatly affecting the delicate parts; and not only affecting the ear itself, but also the brain connections therewith. The eye is yet even more affected by the demands of civilization, for perhaps no other organ has had heaped upon it so many new things by advanced civilization as has the eye, and it has hardly been able to keep pace in its growth and power of adjustment with the increase of the demands. Whether or not civilization has brought on an increase of abnormalities of these two sense-organs may never be fully known, but no one can doubt that the increasing demands made upon them must have aggravated any original abnormalities to such an extent with the child of today as to demand our careful consideration.

Just what number of children in any given schoolroom may have defective sight or hearing can be ascertained only by careful examination; but the teacher may be sure that there are several. The latest gathering of statistics has been by your committee, who find that returns from their inquiries show "that large numbers of children in the public schools are handicapped in their progress thru school by defective sight or hearing."

By the statistics gathered from various sources, it is clearly shown that a large number of school children have defective sight and hearing. Perhaps the best and most conclusive examinations of the sight and hearing of school children made in this country are those of the Chicago Child Study Laboratory. The results obtained in these examinations are in some ways different from those obtained elsewhere. As they are most carefully made, they bear much weight and deserve our highest regard.

In his two articles on sight and hearing in the *Journal of Adolescence*, giving reports from the Chicago Child Study Laboratory, Professor Krauskopf shows that upon first entrance to school at six years of age 32 per cent. of the children were found with defective sight, and 26 per cent. with defective hearing. He shows in the highest form of defective sight, 20-30 of normal vision or lower, and of defective hearing, 3 or more points below normal, that there is a very rapid increase in the percentage of defectives until the highest point is reached not far from the ninth year—before the ninth in hearing and after the ninth in sight—and then as rapid a decrease till the lowest point is reached not far from the thirteenth year—before the thirteenth in hearing and after the thirteenth in sight—which goes lower than that upon entrance to school. Then a slight rise takes place, till at the close of the high school the percentage of defectives is about the same as upon entrance to school. In the lower forms of the defectives there is shown a difference in these two senses. In sight there is an increase of defect from entrance upon school all the way through school life, while in hearing the lower forms show rise and fall as in the higher form, but at end of school life there is a higher percentage than at beginning of school life.

The great fact brought out by these Chicago investigations is the very

rapid increase of defective sight and hearing in the early school years of the child, which culminates not far from the ninth year. This is a remarkable time in the life of the child, for other troubles show strongest about this year. At this time the brain has about reached its full weight, and in its development is changing from increase in size to increase in function. This is also the time of the greatest susceptibility to fatigue in the life of the child; for near this year there is a sudden growth, which is not shared by the heart, so that it does not keep pace in growth, while the extra strain on it causes dilation and great fatigue when exertion forces the heart to do more work than it can rightly accomplish. The maximum weight of the spleen in proportion to the body comes at this time, but just what that means is not determined. At this year, too, the child has yet about half of his temporary teeth remaining, most of which are in bad condition, thus preventing proper mastication of food, and frequently keeping the child from eating sufficient amount of food because of pain from the bad teeth. All these conditions lower the general tone of the child's system, and, with the adenoid and catarrhal growths and the various infectious diseases of childhood, act upon these two senses of sight and hearing so as to increase the bad condition which school work aggravates.

Whether the school greatly affects these two senses in older pupils may be a question, but there surely can be no question that it does cause an increase of defects in the early school years. This is well shown in nearsightedness. Most young children are, perhaps, farsighted, but, strange to say, in their work they often bring objects near to them, so that they may be counted as normal or even nearsighted. With proper care, it is held, such children could be saved from much nearsightedness, if not wholly from it. School work requires close application, and this, when continued, so affects the plastic eye as to change it and pass it from farsightedness thru the normal stage on to nearsightedness. It is held that the learning to read by the young child requires the same amount of eye-strain and exertion as the learning to use the microscope by the older people. If this is true, it can readily be seen that the growing eye is greatly affected thereby. Some teachers have been convinced that reading, writing, and the like, should not be begun by the child until he is at least ten years of age. Not only is the actual reading itself a heavy strain on the child, but there also goes with it the getting of the thought, keeping the place in the book, holding the book properly according to the teacher's views, and other requirements which worry the child and help to keep up the strain on him and so react on the sight. Not only may the child's defective vision cause him to take a position that the teacher may deem awkward, but even the position of the eyes in the head may make it imperative that he hold his head differently from others. Thus Stevens in *Popular Science Monthly* (Vol. LIX, pp. 390-401) shows that the long head has a low plane of vision, and so holds the chin up and head back; and the broad head also has a low plane of vision, but not quite so low as the high head, and the head goes back; while the tall head has a high plane of vision and carries the forehead forward,

making the head turn down. Such positions are to lessen the strain on the eye muscles, because of the need of elevating or lowering the eyes to get the proper plane of vision.

The important part that sight and hearing bear in education requires that the eye and the ear be in good condition, and with children that are defective in these senses all possible should be done that would help them in their work. The eye is of special importance because of the great amount of work required of it and of its assistance to the hearing. We are scarcely aware of the great help the eye gives to the ear—especially that given in understanding spoken language thru lip-reading. Without proper examination, neither teacher nor parent nor even the child himself may be aware of the defect, or at least of the extent of it. This is because such a child does not always show the same degree of defect, and in hearing he usually turns the better-hearing ear toward the one speaking, and thus at times shows much better hearing than at others. Also the latent power in these senses is brought into play at moments of great interest, and so gives the child almost the appearance of normal-hearing children. Again, the child is not aware of his defects, and considers that he has the usual sense-power, that he is not different from other children, that all children see and hear as he does, and so he makes no complaint. This is well illustrated by the following from Krauskopf:

In testing some three hundred graduates of the secondary schools of Chicago, a number of them were found suffering from marked defects of vision of which they were entirely unaware. Supposing that others had the same difficulties in seeing objects as themselves, they had finished the entire course of the city schools without realizing how seriously they had been handicapped.¹

Defective sight or hearing in children is quite hurtful to good school work. A child so afflicted fails to understand, because he cannot see or hear properly, and so loses interest and becomes indifferent. He then is designated as lazy or stupid by his teacher. He cannot do his work quickly, and so must make slow progress, until in the grammar grades many cases are found of children below grade; that is, children whose ages should place them in a higher grade than that in which they are classed. In every instance of investigation of sight and hearing, the dull, the lazy, and the stupid children of a grade have been found to be in most cases defective in sight or hearing, or both. Some investigators go so far as to claim that every dull child has defective sight or hearing, or both. Krauskopf sums up the Chicago results thus:

Chance plays but a minor part in pushing the pupil above grade, so that this group of advanced pupils are for the most part of exceptional ability; while many causes besides mental deficiency may tend to keep a child back in school, and the group below grade will not consist entirely of dull pupils. Notwithstanding this, and in spite of the fact that hearing is only one of the many factors that might affect the child's school standing, there is no point where those below grade are not on the average distinctly inferior to their more fortunate companions.²

Such defects, too, have great influence upon the character of the child.

¹ *Journal of Adolescence*, Vol. I, p. 198.

² *Ibid.*, Vol. II, p. 105.

His inability to see or to hear well causes him to lose interest and to become careless, and, if punished by his teacher, he feels that he is wronged, yet without knowing the true conditions; hence, he perhaps grows stubborn or morose, or, worse yet, becomes filled with the feeling that all is against him, and so loses hope and falls away too often into that number who become truants or criminals. This is well shown in that the tests on the boys of the John Worthy School in Chicago—a school for truants and the like—showed these boys to have greater defects than the children of the public schools and even of those below grade.

We all believe, I am sure, that there should be stated and careful examinations made of the eye, the ear, the nose, and the throat of all school children, and tests of the sight and hearing. Such ought really to be made by specialists and not left to teachers. Yet for the present we have not progressed sufficiently to feel the need of specialists, and so the teacher will have it to do if it is done. The teacher may make the simple tests of sight and hearing which will be of much help, especially in gaining a better knowledge of the dull, the backward, and the bad children. Dr. Allport has worked out plans whereby this can be carried on by teachers, and, as mentioned before, thru his efforts these plans are being introduced into the schools of this country.

Where tests of sight and hearing have been made in schools, there usually follows a reseating of the children, so that those with defective sight or hearing are given seats more favorable to them for seeing and hearing, and the parents are notified of the condition of their children. But simply seating the child in a more favorable locality only partially accomplishes the results needed. He should be carefully studied so that his condition may be well known all the time, and he should be taught in such a way as to give him every opportunity for growth and improvement; and this really can be accomplished only by specially trained teachers. Also the notifying of parents will not necessarily end in just the improvements needed, but the school authorities should work with the parents in this matter, and should see that all is done for the child which is needed to be done. That parents may be well-meaning, and yet fail properly to look after these needs, is seen when in tests made on sight of children glasses worn by the children were frequently found to be of no use to them, and indeed in many cases were really injurious, the parents having failed to have examinations made and glasses changed as frequently as needed.

Should the teacher be prevented from testing the sight and hearing, even by the simplest methods, because of prejudice on the part of the parents and school authorities, he may learn much by quiet observation. He should from day to day take careful notice of his pupils, and especially so of all dull, vicious, and lazy ones. By carefully noting of pupils, habits will be found which may lead to the ascertaining of the defects. Notice if pupils are in the habit of keeping one side of the head, usually turned to the one speaking or reciting, and if at times when this side is turned away the pupil comprehends as well and quickly as at the other times; also see if such pupils, when deeply interested in

something being told, can withdraw their attention to something else as quickly as can the other pupils. Pupils who cannot do this probably have defective hearing. Note if there is frequent wrinkling of the forehead as if frowning, throwing forward of the head, turning about to catch a better focus, and holding work close to eyes; if frequent headaches occur, and if in reading a child persists in mispronouncing words which it is certain he knows. Such may arise from defective sight. In dictation exercises and copying of work from the board, if frequent mistakes are made, they are pretty certain to arise from defective sight and hearing. If a child has a dull, expressionless face; if he keeps his mouth open; if his face is flat, as tho deformed, with almost an idiotic stare upon it; and if such a child is disturbed by bad dreams, snores at night, is addicted to nightly bed-wetting, such facts pretty well determine that the child is a sufferer from adenoid growths. Thus the teacher may find the defective children of a schoolroom, and yet it must be known that there are children whose defects can be learned only by careful tests by a specialist; and even in some cases the specialist may be unable to learn the extent of the defect.

Since the state provides the school buildings and appurtenances, and then compels the child to attend the school, the state should supply the child with means to keep up and improve his physical being, and to prepare him and keep him in condition to do the work required of him by the school. Therefore the state should carefully examine every child, and see that he gets proper treatment for his defective sight and hearing, and that he is provided with whatever he may need to make it possible for him to see and to hear the work he is to do.

A very different classification of school children should be made than is the custom now. Instead of wholly classifying on the basis of mental aptness, there should also be a classification according to physical capacity and condition. In sight and hearing, the children should be carefully examined and classed according to the degree of these senses possessed by them, and frequent examinations should be made and frequent changes in classification, as children improve or become worse in these senses.

Teachers in the common schools have very much yet to learn from you teachers in special education. Teachers should be carefully trained to instruct children of different degrees of sight and hearing, and to know how to help them to improve physically as well as mentally. The school of the future will be filled with experts, not only in subjects and methods, but also in knowledge of children. The children will be carefully studied and examined, and classified according to physical and mental conditions, and teachers specially trained will take charge of special children, just as at present in our special education we divide into the blind, the deaf, the deaf-blind, the feeble-minded, and the like, and further divide these into classes and groups, and have specially trained teachers to take charge of the special classes.

The patience and close work in the training of feeble-minded children

should be used in the training of children in the common schools. As careful a study should be made of each normal child as is now made of each abnormal child. The physiological method of Seguin needs to be applied to the children in the common schools, and especially to young children; and not till such is the case can our children receive such care and training as they need properly to develop their being.

REPORT OF THE COMMITTEE ON STATISTICS OF DEFECTIVE SIGHT AND HEARING OF PUBLIC SCHOOL CHILDREN

To the Department of Special Education of the National Educational Association:

The Committee on Statistics of Defective Sight and Hearing of Public-School Children, appointed by this department of the National Educational Association at the meeting of 1902, at Minneapolis, Minn., made a most interesting report at the Boston meeting last summer, giving statistics which were collected for the committee thru the Bureau of Education.¹

It was found that out of 34,426 pupils examined in six cities, 13.4 per cent. were seriously defective in sight; and out of 57,072 pupils examined in seven cities, 3.6 per cent, were seriously defective in hearing.

These percentages, obtained from a comparatively small number of pupils, and varying greatly, as the report showed, in different cities, cannot be taken as a definite basis for computing the number of such defective children in the whole country; but they certainly point out most plainly a state of affairs which calls for uniform and methodical examination with the view of alleviating present troubles, of finding out the causes of the defects discovered, and of checking them, if possible, in the future.

The report of last year's committee was accepted, and the committee was enlarged and continued, with the suggestion that methods of testing the sight and hearing of school children should be investigated.

The present committee, before beginning active work, endeavored to obtain the assistance of the Bureau of Education in sending out queries and gathering further statistics; but, on account of the great pressure of work at the bureau because of preparation of the great exhibits for the exposition, the Commissioner of Education felt unable to offer the assistance sought.

The idea of testing the sight and hearing of school children is by no means a new one. In some cities, such as Worcester and Chicago, much systematic work of this kind has been going on for years, but from the statistics gathered last year it was clear that in a great many cities nothing was being done. Therefore the committee, to stir up interest in the work, sent out the full report of last year's committee to superintendents of public schools in about 125 of the largest cities of the United States.

¹ *Proceedings of the National Educational Association for 1903.* A full report, with a valuable appendix, is published in the advance sheets of the Report of the Commissioner of Education for 1902, chap. 46.

It was decided that the committee itself, by experimenting for a short time with various tests, would not be able to obtain results of any value compared with those already obtained in several places where different kinds of systematic tests of the sight and hearing of thousands of school children have been carried on. Therefore the following set of questions was sent out to the superintendents of schools of every city of the United States of 30,000, or over, inhabitants.

1. What method or device is used to test the sight of the pupils of the ——— public schools?
2. What method or device is used to test the hearing of the pupils of the ——— public schools?
3. By whom (whether by specialists or by the teachers of the pupils examined) are the tests made?
4. In case preliminary tests are made by teachers, are the pupils found defective when tested by specialists?
5. Are the kindergarten children, or children unable to read, tested to determine defects of sight, and, if so, what device is used?
6. Do you consider the watch test a proper and sufficient one to be used by the teacher to determine defective hearing?
7. Have you ever used methods, other than those given above, of testing sight and hearing? If so, why did you change?
8. What are the main causes of defective sight among your school children?
9. What are the main causes of defective hearing among your school children?

These questions were sent out to 135 cities, and fifty-five replies were received. In twenty-eight of these cities formal tests of the sight of children able to read are made periodically; in nine others informal tests are made by hearing the children read, by using charts, and by general observation.

In twenty cities formal tests of hearing are made at regular intervals; and in twelve cities informal tests are carried out by means of conversation, reading, and general observation.

In only nine of the fifty-five cities replying are the kindergarten children, or those unable to read, tested for defective sight.

Snellen's standard test types are employed in nearly all cases for testing sight. It has been pointed out by several authorities that this test is not sufficient for detecting "farsightedness," neither is it a test for color blindness, and some other defects of vision, and in a few cities additional devices are employed to make the test more complete. However, the test by means of Snellen's types, simple color tests, and observation on the part of the teacher as to the causes of headaches among the pupils have, in several cities, led to the detection of nearly all cases of defective vision.

Testing the sight of kindergarten children, or those unable to read, is successfully accomplished in Chicago and other cities by means of the illiterate, or "E" test, which consists of placing an *E* in different positions

E W M E

at fixed distances, and requiring the child to place an *E* in the same positions. Naming familiar objects at fixed distances, and recognizing or reproducing

simple geometrical forms from given distances, are other tests that are employed with young children.

A majority of the replies to the committee's questions shows that testing the hearing by means of a watch is not satisfactory. In Chicago the watch is supplemented by the use of the voice, a "clicker," and the audiometer. In Worcester the ordinary voice is used. In all cases where defects of hearing are suspected it is clear that the teacher's observation must count as a part of the test.

The reported causes of defective vision are numerous. It is of much interest to note that only one reply gives bad lighting of schoolrooms as a cause. Lack of proper ventilation, lack of outdoor life, bad postures in sitting, the habit of holding books too near the eyes, poor print, and the constant use of the eyes, are all given as causes, every one of which nearly all teachers are aware of, but noted here because the removal of these causes lies largely with the teachers and principals of the schools.

The causes of deafness as given show little connection with schoolroom life, and their prevention lies rather in the hands of parents and physicians.

A fact worth attention is that the state of Connecticut requires tests of the eyesight of school children every three years by means of Snellen's test types.

In Philadelphia, Jersey City, and Yonkers regular medical inspectors or specialists test the sight and hearing of all school children. In New York and Boston, while every child is not tested, all backward children are given a thoro examination by specialists. In Chicago a regular child-study department is maintained, the head of which has charge of the work of testing the sight and hearing of the children.

At the last meeting of the American Medical Association the following recommendation was passed:

Resolved, That it is advised by the American Medical Association that measures be taken by the various school authorities and boards of education, boards of health, and, if possible, state legislators, to secure examinations of the eyes and ears of all school children in this country, with a view to suitable treatment for the relief of ophthalmologic and otologic imperfections.

In conclusion, the committee reports that it believes periodical tests of the sight and hearing of all school children, including those in the kindergartens, should be made in every city of the United States in order to discover cases of defective vision and hearing.

It believes that these tests should be conducted, where possible, by regular medical inspectors or specialists, but that they may be conducted satisfactorily by the teachers, if they themselves are first instructed by a specialist.

It believes that the parents of all children who are thus found defective should be notified, and the child, if examined first by a teacher, should be sent to a specialist. As many of the defects of sight are directly caused by school life, it does not seem proper to leave the matter to the authority of parents alone.

APPENDIX

A

Cities in which regular tests of the sight of school children are made: Atlanta, Bridgeport, Cambridge, Camden, Chicago, Cleveland, Denver, Duluth, Elmira, Grand Rapids, Jersey City, Little Rock, Lowell, Milwaukee, New Haven, New Orleans, Philadelphia, Rockford, Saginaw, San Antonio, Somerville, Superior, Trenton, Utica, Waterbury, Williamsport, Worcester, Yonkers.

Cities in which regular tests of the hearing of school children are made: Atlanta, Cambridge, Camden, Chicago, Cleveland, Denver, Duluth, Grand Rapids, Little Rock, Jersey City, Lowell, New Haven, Philadelphia, Rockford, Saginaw, Superior, Trenton, Utica, Worcester, Yonkers.

Cities in which kindergarten children are tested for defective eyesight: Camden, Chicago, Cleveland, Duluth, Lowell (in some of the schools), Philadelphia, Trenton, Utica, Yonkers.

Any one desirous of obtaining detailed information as to how tests are carried on in these cities will find much interesting matter in the report of last year's committee. School superintendents are also usually very glad to supply all the information they can.

B

Examples of notices sent to parents when children have been found defective in sight or hearing.

DULUTH PUBLIC SCHOOLS

OFFICE OF _____ SCHOOL.

MR. and Mrs. _____.

By request of the board of education, your child, with many others, has been examined by Drs. Titcomb and Collins for eye, ear, nose, and throat trouble.

As a result of this examination _____ is found to have sufficient trouble with the _____ not only to compel _____ to work at a great disadvantage, but also to menace the child's best development and be a cause of ill-health.

The board of education herewith urges you to have this matter attended to by some competent physician or specialist, believing that it will result greatly to the benefit of your child.

Yours respectfully,

_____, Principal.

WORCESTER, MASS., _____ 190-.

By vote of the school committee, the superintendent of schools has been authorized to have tests made annually of the sight and hearing of all pupils in the schools. This is done by the principals of each school under the direction of competent physicians.

The sight of _____ has been found below the standard deemed necessary for the proper execution of school work. It is advisable that you consult a physician (not an optician). Trusting that you will co-operate by having an examination made at once, I remain,

Yours truly,

_____, School.

By order of the school committee.

C

Superintendent F. H. Beede, of New Haven, reports in regard to the law of Connecticut:

"I would say that the law relative to the testing of the eyesight of school children in this state is very simple. The state law requires that the eyesight of pupils in all schools of the state shall be examined triennially according to the instructions furnished by the state board of education. These instructions are not elaborate. The regular card used for testing the eyesight by physicians is used for this purpose in the schools. Teachers are required by law to notify in writing the parent or guardian of every pupil whose eyes are found to be defective or diseased. The teacher must also make a written report of such cases to the state board of education.

"There is no law in this state requiring the testing of the hearing of school children."

D

Dr. James B. Fitzgerald, director of physical training in the Boston public schools, reports through Superintendent Edwin P. Seaver:

"There is no regular examination of the eyes and ears in the Boston schools. This course was decided upon after consulting some of the most eminent specialists in the city. No examination is made until the child shows some definite symptoms. When this happens, the teachers report the cases to the parents in a formal way and urge that examination be made by a specialist. Usually this is done; but when it is not done, the responsibility is with the parents, where in our opinion it belongs.

"Our teachers are taught the common symptoms of defective sight and hearing, and in my opinion the system works well.

"We *do*, however, have the eyes and ears of backward children examined occasionally by specialists."

Dr. Elias G. Brown, of the board of education, New York city, reports:

"The plan for examining all defectives in the New York city public schools is as follows:

"Children who have difficulty in keeping up with their classes, for any reason, are reported to headquarters (board of education). Being in charge of work for defectives, I visit the different schools and examine all children reported. As yet no attempt is made to examine children who keep up with their classes.

"My examination is into the mental as well as the physical condition of the children, to see, if possible, what it is that holds them back. In many cases it is pure mental deficiency. In other cases it is defective sight or hearing. The test I make for sight and hearing is simple and practical—simply to determine whether sight or hearing is defective enough to prevent usual progress in the school grades.

"The examination is made as follows:

"The child is required to stand across the room and, one eye covered, tested as to ability to tell how many fingers I hold up. Astigmatism is not tested for, unless headaches or some other symptom is complained of by the pupil, or unless the teacher gives a report indicating to me the probability of astigmatism.

"Special classes or special treatment is advised where indicated.

"Children who may have slightly defective eyesight or hearing, but who keep up in grade, are not examined. This step has not yet been reached."

E

WORCESTER PUBLIC SCHOOLS

EYE AND EAR EXAMINATIONS

(From instructions for examinations)

Do not expose the card except when in use, as familiarity with its face leads children to learn the letters "by heart."

First- and kindergarten children need not be examined.

The examination should be made privately and singly, in a room or hall well lighted, and as quiet as possible, apart from the general school session. Eyes and ears should be tested at the same sitting.

Ascertain if the pupil habitually suffers from inflamed lids or eyes.

Children already wearing glasses should be tested with such glasses properly adjusted on the face.

Place a card of Snellen's test types on the wall in a good light; do not allow the face of the card to be covered by glass.

The line marked XX (20) should be seen at twenty feet; therefore place the pupil twenty feet from the card.

Each eye should be examined separately.

Hold a card over one eye while the other is being examined. Do not press upon the covered eye, as the pressure might induce an incorrect examination.

Have the pupil begin at the top of the test card, and read aloud down as far as he can, first with one eye and then with the other.

If the pupil does not habitually suffer with inflamed lids or eyes, and can read a *majority* of the XX (20) test type with *each* eye, and does not, upon inquiry, complain of *habitually* tired and painful eyes or headaches after study, his eyes may be considered satisfactory; but if he habitually suffers from inflamed lids or eyes, or cannot read a *majority* of the XX (20) test type with *both* eyes, or *habitually* complains of tired and painful eyes or headache after study, a card of information should be sent to parent or guardian.

To examine for defective hearing, test each ear separately. Have pupil stand twenty feet distant, facing squarely to right or left, not allowing eyes to turn toward examiner. Have pupil gently press a soft handkerchief to the ear turned away from examiner, and then whisper, slowly and distinctly, or pronounce in an ordinary conversational voice, words or numbers, requiring the pupil to repeat them as soon as heard. If the words are not heard at twenty feet, approach pupil until they are heard, and note the distance, and record in the blanks furnished for the purpose. If found defective, a card of information should be sent to parent or guardian.

The committee believes that to secure uniformity, Snellen's test types should be used as a part of the test of sight, and the ordinary voice, as used in the tests in the city of Worcester, should be employed in the examination for defective hearing.

The committee believes that these statistics should be collected at regular intervals; that it is not likely it will be done by the Bureau of Education; that

	NUMBER OF CITIES	BY WHOM CONDUCTED		DEFECTIVE CHILDREN		TEST USED	TEST FOR KINDERGARTEN
		Principal or Teacher	Specialist	Referred to Specialist	Sent to Specialist		
SIGHT							
Informal tests ...	9	9	0	2	1	Observation: reading print at various distances.	
Formal tests....	28	25	3	17	7	For "nearsightedness" twenty-four use Snellen's test types; for "farsightedness" teachers depend upon observation. Three report tests for color-blindness.	Four use "E" or illiterate test. One uses pictures of familiar objects; three depend on observation and testing by simple geometrical figures, O, Δ, etc.; one uses intersecting line test.
HEARING							
Informal tests....	12	12	0	1	2		
Formal tests....	20	17	3	7	5	Test used: Fourteen cities use the watch test; six use the voice; other supplementary tests are by means of a "clicker," tuning-fork, and audiometer. On the question. "Is the watch test satisfactory and sufficient?" Ten reported "No," four reported "Yes."	

The figures all refer to number of cities. Total number replying, fifty-five.

the National Educational Association might do it thru a permanent committee; but it points out that there is no provision of funds to carry out such a work.

Finally, the committee urges that the *causes* of defective sight and hearing should be investigated, with a view to educating children, parents, and teachers on the subject, and thus preventing, as far as possible, such defects among our school children.

Reported causes of defects of sight.—Astigmatism,[†] hypermetropia,[†] myopia,[†] acute inflammation,[†] bad furniture, bad posture at desk, congenital causes, constant use of eyes, defective light at home, holding books too near eyes, lack of outdoor exercise, poor food, poor print, poor ventilation of schoolrooms, neglect of parents and teachers.

Reported causes of defects of hearing.—Adenoid growths, catarrh, congenital causes, falls, measles, neglect of parents, scarlet fever.

F. W. BOOTH, *Chairman*;

O. H. BURRITT;

F. PARKE LEWIS;

CLARENCE J. BLAKE;

PERCIVAL HALL;

Committee.

THE CHICAGO HOSPITAL SCHOOL FOR NERVOUS AND DELICATE CHILDREN—ITS EDUCATIONAL AND SCIENTIFIC METHODS

MARY R. CAMPBELL, DEAN OF THE CHICAGO HOSPITAL SCHOOL FOR NERVOUS
AND DELICATE CHILDREN, AND EDUCATIONAL ADVISOR FOR THE
CHICAGO SCHOOL OF SPECIAL EDUCATION

In this era of greatest scientific educational triumphs in the care of all defectives, the blind are trained to have seeing fingers, the deaf to have hearing eyes. After such educational triumphs in the training of one sense to function for another, and the re-educating of the insane to mental balance, dare we not hope much for those whose senses are unimpaired, but whose minds are mentally blind or crippled?

It is not, therefore, of the deaf, nor of the blind, nor yet of the feeble-minded, that I would speak; but it is of those children so slightly subnormal that they cannot be properly provided for educationally with any of these three classes just mentioned, nor can they be educated, as our educational system stands today, with the children in the public schools. I refer to those children who thru accident or illness have been left with imperfect mental and physical functions. They are the hearing mutes; the children of retarded speech; the children who, as the result of illness, must be redeveloped and re-educated; the children who, because of injury at birth perhaps, have

[†] These are, of course, the defects themselves, but were reported as causes.

orthopedic conditions sometimes coexistent with unintelligible speech; and the children who, on account of malnutrition, are temporarily subnormal. These are the children who, with minds working almost normally, have not even a fighting chance. To the wealthy few the special education necessary to bring them out of this subnormal condition is now possible. To the thousands of poor the two or three years of special education and care requisite to develop even the normal attitude in these children is practically out of the question.

Chiefly from this class of children slightly subnormal, because of malnutrition in particular, come the children of wayward tendencies—the recruits to swell the ranks of the juvenile criminals.

How are the needs of such children to be met? Such children require not merely the care of medical specialists, but expert nursing and scientific educational care.

To provide special education for slightly subnormal and invalid children; to provide the laboratory facilities for the scientific investigation of the phenomena as evidenced by such children; and to provide the special training for teachers and nurses who wished to fit themselves for work with such children, were the three primary aims in organizing the Chicago Hospital School for Nervous and Delicate Children.

That the first purpose has been accomplished is evidenced by the fact that 60 per cent. of the children who have received educational and medical care in the school are now working with normal children. The success of the first aim was obtained thru the second—the scientific investigations, some of which have already been published, and others of which are to appear during the coming year. The third aim has been realized, with the exception that the demand for teachers has by far exceeded the supply.

How hearing mutes have been taught to talk; how the erratic and nervous child, but temporarily subnormal, has been brought into such poise and balance that he can work with normal children, is too long a story to tell at this time. To present in full the methods that have brought some of these children out of a condition of twilight and beclouded minds into rational beings would necessitate a thoro presentation, covering all the daily observations of teachers and nurses during a period of two to three years—the time required in producing the permanent results. To give an idea of the kind of children and of the methods employed in accomplishing these satisfactory results with them is the object of this presentation.

Every child in itself was a problem, and a very complex one at that, with its many coexistent disorders. How to overcome a child's anæmic condition, how to overcome special defects and orthopedic conditions, and how to give the child as much educational work as he was able to do, were taxing problems, not the least of which was how not to sacrifice the individuality of the child by all the necessary therapeutical measures and technical laboratory work. How to preserve the personality of the child was the greatest problem.

Necessarily the peculiar needs of the individual children shaped our laboratory methods. The child who was subnormal mentally and physically had to have outlined for him a method of educational procedure different from that of the child who was supranormal mentally, but subnormal physically. The child who was abnormal in sensory defects, but whose central condition was apparently normal, could not be approached in the same way as the child whose defect was central.

Fully 75 per cent. of the children admitted since the organization of the school in 1899 were suffering from malnutrition and anæmia, in addition to other pathological conditions. The typical cases—such as speech-defect due to injury at birth; general orthopedic conditions due to instrumental birth; functional neuroses; psychic epilepsy; paralytic cases due to infantile meningeal troubles; juvenile insanity; defective speech due to infantile illnesses; stammering, stuttering; partial deafness; cases of disproportionate mental development—were some of the infirmities of the children brought to us for treatment; the most difficult cases being those in whom, coexistent with speech-defect, were other orthopedic conditions and marked motor inco-ordinations. Many of such children had minds very nearly normal, or whose mentation was even supranormal.

None of the problems presented by the peculiar infirmities of such children could be adequately met by an exclusively analytical method—a method too often employed in the study of children. The analytical had to be supplemented by the observational, and this, in turn, by the experimental, and in some cases by chemical analyses of foods and excretions. It was by combining these methods that the problems worked out at the school yielded such fruitful results. The daily life of the child was recorded in minute detail.

Every child was constantly under skilled observation from the time of his awaking in the morning until his retiring at night. There were three trained nurses for the ten children under observation, and fourteen teachers, including the special teachers, the tutors, and supplementary teachers.

The empirical data gathered by the nurses covered such points as the following, which I present in the same sequence as recorded in the nurses' daybook:

1. A report on how the child slept and rested during the night.
2. The time of his awaking in the morning.
3. The child's emotional tone on awaking.
4. The child's temperature, pulse, and respiration on awaking.
(The object of taking this record before the child arose was to determine his normal pulse before physical exertion).
5. The kind of bath given the child—whether salt, cold or tepid, or a shower bath.
6. The time of dressing and length of time consumed in dressing.
7. The child's attitude toward others.
8. The quantity of water taken during the morning.
9. The kind and quantity of food taken for breakfast.
10. The exact time of the performance of physical functions, with a record of the kind and quantity of eliminations.

11. The pulse record taken immediately *before* a period of special mental effort.
12. The pulse record taken immediately *after* a period of special mental effort.
(This was to show the effect of fatigue on the pulse as induced by particular work.)
13. The general social conduct of the child during his free play period.
(The children were very carefully observed during their play time, for the child is most truly himself when he plays.)
14. The pulse record at midday, to show the effect on it of the morning's physical and mental fatigue.
15. The kind and quantity of food taken at luncheon.
16. The pulse record immediately after eating.
17. A report on the afternoon nap—duration, the effect on mental efforts for the afternoon.
(The records of a number of children showed that better work was done from four to six in the afternoon than at any other time during the day. It seemed as tho they were reinforced both physically and mentally.)
18. The pulse record of the child immediately after his afternoon nap.
19. The kind and quantity of food eaten at dinner.
20. The time during the day when the greatest hunger was manifested.
(Inasmuch as hunger is one of the strongest and most imperative of the child's feelings, it seemed one of the most important points to record was when this feeling most strongly evidenced itself.)
21. The mental condition and social attitude of the child during the children's social hour.
22. The temperature, pulse, and respiration of the child at bedtime.
23. The kind of evening bath—whether hot or tepid.
24. The kind of massage—whether dry rub or oil massage.
25. The exact time of going to sleep.
(A very careful note on the last point, to show accurately the number of hours' sleep per day the child had.)

The data gathered by the teachers were both empirical and experimental. They covered the following points:

1. A note was made as to the kind of day, whether sunny, cloudy, rainy, snowy, warm, hot, chilly, or cold; and the apparent effect on the child.
2. The physical and mental condition of the child on entrance into the class was carefully noted.
3. The pulse at the beginning and at the end of mental activity was taken to show the effect of the particular lesson.
(From this group of special data we were enabled to arrange the children's programs of work so that the lessons producing the greatest fatigue would not come too close together, and so that the hardest lessons would come at the time of the child's period of maximum energy.)
4. The child's emotional tone was very carefully noted, and its relation to the child's physical and mental attitude.
5. The child's dominant interest.
(This was sometimes taken as a central subject, and about it was grouped his other work.)
6. A report of the lesson—its aims, methods, and results.

Other observations of both teachers and nurses showed a record of—

- a) Any unusual manifestations.
- b) Anything that might deflect or modify a child's emotional tone—such as parents' visit, peculiar influence of teacher, etc.
- c) Anything that might affect the natural unit of the child's life.
- d) Anything normally naughty.
- e) The effect of weather on the mental condition of a child for a given day or for a number of given days.

In addition, the weight and height of the children were taken every twenty-eight days. Blood counts with the anæmic children were made every seven days, and a monthly digest report of the condition of certain children was sent the consulting physicians.

Seemingly unimportant phases, such as the relation of preferred foods and better digestion, and the relation of pulse deviation to emotional tone, threw great light on the emotional tone of the child as affecting his general physical and mental activity. The fact that a teacher could, by referring to the nurses' record for the day, find out the exact number of hours of sleep the child had, explained to her many times the cause of Johnnie Jones' irritability, and why he seemed to have got out of bed on the wrong side, and could not concentrate his attention. The children were studied as carefully during their sleeping as during their waking hours.

During sleep it is generally admitted that the pulse is slower and more regular, and yet many times I have observed that the pulse of some of our most nervous children during their sleep indicated almost the same rate of beat as during the daytime, thus showing that mentation of some sort was going on. I made a particular study of some very nervous children who dreamed a great deal, and in one case the pulse beat was higher at this time than during the mental activity of the day. Nervous children, as a rule, dream a great deal, and thus is much of their nervous force consumed, incapacitating them for mental effort during school hours.

A very careful study was made of the emotional tone as affecting the pulse, and of the pulse as affecting the emotional tone. This emotional tone is an index of the current state of the nerve centers as a whole, and is therefore an index of the mental dynamics of the child.

From these charts you will see a connection established between the emotional tone of the child, his pulse beat, and his eliminations.

We found, after a study of some three years, that a markedly subnormal pulse coexisted with the subnormal mental activity of the child. A child with a pulse of 56 to 64 beats could not be expected to do the work of a child whose pulse was 80 to 90; neither could a child whose pulse was bounding from 80 to 110 and 115 do the careful, concentrative, even work of the child whose pulse was averaging 80 to 90 beats. Brain conditions were changed when, by close study of the pulse during any period of work, the pedagogical stimulus was changed. After a very careful study of the relation of the child's pulse to mental fatigue, we sometimes rearranged the child's entire program of work for the day, based entirely on the fluctuations and deviations of pulse beats. These pulse records of the teachers and nurses were made by tactile investigation rather than by the distracting mechanical registration of the sphygmograph.

Taking a child's respiration was another of the teachers' and nurses' methods of anticipating the nervous climax in the child. To calm an excited, nervous child by a few systematic deep-breathing exercises, to reduce the nervous condition, was another simple, but effective, mode of treatment.

When the child is first admitted into the school, he is given a thoro physical examination by one of the neurologists. The family and personal history of the child are taken. In investigating hereditary causes of the trouble, we

did not confine ourselves to the parental history only, but went back even to the great-grandfathers and the great-grandmothers, and to their collateral history. Curious as it may seem, with our particular children, grandmothers and grandfathers were less important factors in the causes of the condition of the child than the condition of malnutrition in the immediate life-history of the child.

After the neurologist had made the preliminary examination, a series of anthropometrical and psychophysical measurements were taken, to afford some basis for the pedagogical methods to be prescribed. This initial examination also included a microscopical analysis of the blood and the kidney eliminations. In the anæmic children blood counts were made every seven days.

While in the statement of methods I am presenting to you only cross-sections, as it were, of some of our researches, I wish it clearly understood that every child was taken in relation to its entire situation. That is to say, if we were studying the development of the mathematical concept in the child, we did not confine our records and observations only to the period of presenting that particular subject-matter, but these records showed, in addition, observations as to how and to what extent the child could apply the idea of measuring magnitude from one subject to another; for instance, from cooking to manual training, or from music to chemistry and physics. If the investigation was one on the restoration of the speech function, our observations were not confined to the child's work during the technical lesson, but covered all manifestations of the speech function, and other factors that might modify and develop the expressive side of his life. Nor did we, in our study of the correlation of the physical and mental states in children, confine our observations to one or two phases of coexistent phenomena. Obsessions and compelling impulses were analyzed by the data preceding and succeeding the overt act. It is unfair to judge a child by a momentary mood, for he has his emotional overtones and undertones; therefore, as it is the whole action that asserts the child's being, we studied the whole child, not the child in part.

I have indicated to you somewhat of our laboratory methods of gathering data on the child's physical and mental life. By these records we were able to establish approximately the individual norm of the child, and also his pathological norm. From our child-study notes we were conversant with his greatest and least deviations from these norms, and with the conditions producing these deviations. Our technical laboratory investigations may be briefly explained by the statement that during one investigation the children were weighed every twenty-eight days, blood examinations were made every seven days, the pulse was taken on an average eight times a day, the food was weighed and chemically analyzed before and after cooking, and the kidney and intestinal eliminations were submitted daily to chemical analysis—all this in addition to the educational work which was being carried on simultaneously.

I am not going into the technical explanations of our scientific method, for

these investigations are soon to be published. Suffice it to say that, as a result of these scientific investigations, we have reached a few conclusions which will be valuable in the care of both normal and abnormal children. We have learned—

1. That the majority of nervous children should have from twelve to fourteen glasses of water per day—two quarts at the very least.
2. That children from five to twelve years of age should average fourteen hours of sleep per day.
3. That children should have the heaviest meal of the day in the evening.
4. That young nervous children require hot baths at least once a day to help reduce the nervous condition.
5. That a close relation exists between pulse deviation and non-elimination.
6. That young nervous children, because of their excessive activity, require more carbohydrates, and should be fed five, six, and even seven times a day.
7. That the so-called abnormal craving of children for candies and sweets is nature's demand for sugars.

A few points were observed that may throw light upon certain forms of insanity. We do not state our conclusion on these points dogmatically, but inasmuch as no data or literature on the subject are to be found elsewhere, we bring forth these points in the hope that further investigation along this line may be made that may throw light on the nervous phenomena of children. Briefly summarizing:

1. By chemical analyses we found that stomach indigestion produced acerbity of disposition, oversensitiveness, fretfulness, and irritability.
2. These chemical analyses also showed that obstruction of the small intestine produced variability, erratic conduct, and similar manifestations.
3. By chemical analysis we found also that obstruction of the large intestine produced stupidity, languor, accompanied by heavy headaches, particularly over the eyes. Moodiness, moroseness, and melancholia were also mental accompaniments of this physical condition.

While we have spent much time in taking psycho-physical and anthropometrical measurements—which were taken, by the way, not to detect defects so much as to show us the rate of growth of a child, and his sequence of developing out of a subnormal into a normal condition—our greatest attention was paid to the physiology of the child's life, his mental as well as his physical physiology, the function side of the child's life being to us more important than the anatomy side. It was the living, growing being, the pulsating, human organism, that was of more importance than the mere anatomical skeleton of the child, which simply showed disproportion, deficiencies, and downward trend.

May I add here that we have found that, in general, stigmata revealed in physical and psycho-physical measurements are no criterion of moral perversions; that anthropometrical measurements do now show or prove the existence or non-existence of criminal tendencies? I may add further that my own conclusion on this point is substantiated by the elaborate investigation of Dr. D. P. MacMillan, of the Child Study Department of the Chicago

Public Schools, and by no less great authority than the New York police representatives of the Bertillon and finger-print system.

The tentative data, however, afforded by the psycho-physical measurements show that the subnormal condition is quantitative, not qualitative; that subnormality is simply a question of degree. In outlining our educational work, we corroborated these measurements by the pedagogical results obtained, and we found that our children could do the same educational work, but in a less perfect way. In all the educational work of the school we have given these subnormal children exactly the same kind of work as was given in the Dewey School and the University of Chicago School of Education. Some of our children, however, could only approximate the work.

With all this scientific investigation and the necessarily great amount of technical work for overcoming the neural defects of the little patients, the motive side of the child was given pre-eminence. Children think in situations, and in our educational work we aimed to keep paramount the meaning side, the desire side, the feeling side, the social side—the controlling elements of the emotional tones of children.

Notwithstanding that one of the main purposes of the school is the scientific research into the physical defects of children—defects that go toward producing general backwardness and mental infirmities—the most beautiful aspect of the school is from the child's standpoint; for everything that is done has a direct bearing, not only upon the needs, but on the desires and wishes, of the children. It is to the child an ideal world. Every child has his particular talents developed. If he shows a marked talent for music, the efforts of the teacher are concentrated along that line. Great attention has been paid to the effect of music both in the way of mental development and in controlling the emotional tone. Some of the children only six years old have been taught to compose, to read, and to write music, as well as to play. Lessons on the piano, violin, and other instruments were given. If manual work seems to be his particular bent, special attention is paid to a child in that line. If simple problems in physics and chemistry interest him, his scientific tastes are satisfied and directed, and the toy steam engine, so dear to the heart of the small boy, is explained by simple problems in physics, and thus his concept enriched. What a child loves to do, he is encouraged to do, unless his desire partakes too much of the nature of an obsession, in which case his attention is diverted by a counter-attraction. The child's natural sequence in the way of personal interests is followed. When a little invalid enters the school, there is no break between his home life and this new environment. A very careful study is made of the child's likes and dislikes, his preferences and tastes, and there is no new arrest in the child's development by the teacher forcing her arbitrary sequence upon the child's own natural mental sequence. To understand the needs of such a subnormal child, it has been most aptly said by a well-known educator that the teacher must get inside that child and look out upon the world thru his eyes.

Music.—In addition to the purely motive side of the work in music, the work is interesting because of the double purpose for which it is given. The speech center and the leg, arm, and finger centers of the brain are adjacent. To assist in developing speech, finger exercises on the piano—finger gymnastics—are given to assist in developing the right co-ordinations and to develop the motor area in the brain. Often a child's first knowledge of number and mathematical concept he gets thru the work in music. In fact, every educational phase of the school is correlated with music.

Speech.—For developing retarded speech or for developing speech in hearing mutes, or to restore the speech function in young children who thru illness have lost the power of speech, the normal co-ordinations of ear and voice are first set up before the eye and ear co-ordinations, or the eye and voice co-ordinations. The success of this method of developing speech lies in the fact that the children learn their vowelization by the sensation of voice-placing and tone-placing. They are given much technique to free them from technique. Notwithstanding that in the majority of speech cases many technical lessons are necessary both in speech and music, the thought side is given much prominence.

Gymnastics.—In the orthopedic gymnastics, which are almost entirely therapeutical in nature, little can be done along this line, but with the introduction of music the exercises become purposeful, and when it is explained to the child that certain treatments will help him to regain the use of his little crippled legs or arms, these exercises become full of interest and meaning to him. And even in these treatments the "why" side of his nature is being satisfied, altho it be by these sometimes painful manipulations upon his own poor little twisted body.

Sometimes it is not the little legs that are twisted. It may be that, because of spinal meningitis, the child has a twisted and twilight mind; for here, in this child's sanitarium with educational provision, children with crooked little backs, crooked little legs, and crooked little minds are admitted, to find benefit and relief thru these special methods.

One of the most interesting phases of the work is the way some of these little cripples take their work in dancing. Unable to stand on their legs, they are placed on their backs on a mattress on the floor, and the gymnastic teacher puts the legs thru the rhythmic dancing movements in time to music. This is done so that, altho the little patient himself cannot execute the required movements, these exercises will assist to develop the motor area in the brain so that the child will eventually gain motor control over his legs, and it will not take him so long to relearn to walk.

While special attention is given to overcoming speech defects and other neural defects, the majority of children are receiving instruction in cooking, simple physiology, elementary physics and chemistry, reading, writing, music, voice-training, and all kinds of gymnastics. Some of the best work is done in sloyd. Those children who are unable to stand sit while at the bench. All sorts of things are made—boxes, paper knives, doll-houses; anything that

the childish mind conceives is fashioned out in wood. In this work technique is subordinated to motive.

As the special methods evolved and developed from our more purely pedagogical experimentations are soon to be published, I have not gone into detail here. Suffice it to say at this time that the generalizations from the conclusions reached are as follows:

1. That music as a factor in the educational development of all young children, both normal and abnormal, should be given greater emphasis.
2. That technical drill on speech—the physiological alphabet—should be given young children, in order to free them from technique.
3. That young children, both normal and abnormal, should be given more dancing. Dancing movements are a prerequisite in developing other motor co-ordination—speech in particular.

Also as a result of these conclusions, the following questions have been raised, calling for further investigations:

1. To what extent is the general nervous condition of children at the age of nine to eleven due to an insufficient quantity of water and of sugars, rather than to that particular period of growth, as is generally conceded?
2. Are not insufficient sleep, and unwise distribution and insufficient number of meals, influential, tho ignored, factors in causing the physical and nervous breakdown of children at that age?

The sanitarium was organized in the fall of 1899. With the opening came more applications than the building could possibly hold. Twelve children were admitted on probation, and from that time to the end of the present school year in May, a period of less than five years, over four hundred children have been examined and tested. Of this number about fifty have been admitted for treatment. With the limited accommodation of house capacity, and the assisting staff, but few children could be cared for. However, the results obtained by the laboratory method, which we were thus better able to work out in minute detail, have made it possible for us to formulate such generalizations from our data obtained as may be applied to the care of both normal and abnormal children. In our investigations we have not sought to be able to establish glittering generalizations, but we have worked for a few fruitful results upon which pedagogical procedure may be based. We lay no claim to originality of method. We have simply brought together in one method of investigation the empirical, the analytical, the experimental, and, merely for corroboration, the statistical method.

The new era in child study is marked by laboratory methods. We are leaving behind us the methods of statistical evidence; the new child study, as does the study of medicine at the present day, demands laboratory methods and experimental evidence.

While we might have obtained much from tradition and hearsay knowledge in the handling of such children, we wanted a first-hand knowledge, and, for this reason, in our child study laboratory we have spent a great deal of time upon recording in minute detail the daily life-history of the child.

We need more laboratory schools for the scientific investigation of sub-normal children. An ounce of prevention is worth a pound of cure, and who knows but what many of the four hundred children we have examined would not have needed special care had their mothers been properly instructed?

Would not a national child-study laboratory, under the auspices of the Department of Special Education of the National Educational Association, be one means of extending the ideals and aims of this section, and also of promulgating the cause of all abnormal children?

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