SCHOOL HOUSE EXPANSION STUDY
MASSACHUSETTS HOSPITAL SCHOOL
CANTON, MASSACHUSETTS

Submitted in partial fulfillment of
the requirements for the degree
Master in Architecture,
Massachusetts Institute of Technology.

James Wood Burch
17 November 1952

Lawrence B. Anderson
Professor of Architecture,
Head of the Department of Architecture.
ABSTRACT OF WRITTEN REPORT

SCHOOL HOUSE EXPANSION STUDY
MASSACHUSETTS HOSPITAL SCHOOL

JAMES WOOD BURCH

Submitted in partial fulfillment of
the requirements for the degree
Master in Architecture, 17 November, 1952,
at Massachusetts Institute of Technology.

The Massachusetts Hospital School at Canton, Massachusetts is a home where 150 seriously crippled children receive extensive medical treatment and education through high school. The school house is an unusually good building that has been outgrown, and the purpose of this study is to design additional space according to the needs of the School's educational program.

The Hospital School was established in 1904 by enactment of the state legislature upon the encouragement of a group of public-spirited men. This group conceived the School as a home-school-hospital where the children could profit by mutual association and be given the highly specialized medical care necessary with as little interruption to their schooling as possible.

Self-reliance, initiative and mutual help are encouraged at the School by a sort of "hands-off" policy, whereby the staff guides and encourages the children but also "leaves them alone" to solve many of their own problems. This policy is considered valuable preparation toward the day when the child will graduate and, it is hoped, become a self-supporting asset to his community.
The educational program has been constantly improved and expanded and offers a curriculum comparable to that of the regular public schools, with the addition of vocational courses leading to occupations especially suitable to the physically handicapped, e.g., watch repairing, sewing and printing.

This curriculum is augmented by a broad range of activities: dramatics, music, photography, scouting, baseball, swimming and outings to theaters, etc.

Success of the Hospital School is borne out by the findings of a Boston College student who conducted a survey of 100 graduates and found 90% to be gainfully employed.

The additional school house space proposed here is based upon the recommendations of the School faculty and retains the existing school house for the use of elementary classes.

The available site presents a problem in that it slopes stubbornly away from the existing school house, whereas the School administration requires, and rightly so, a one-story scheme. The proposed new construction attempts a degree of compromise, the site being shown, partially filled, in a downward slope to the new high school and junior high school structures. The new structures are connected to the existing by a ramped, enclosed passage. Effort is made here to design a series of pleasant spaces, in order to achieve an interesting variety of environments through which the youngsters will move during the school day. The reason for this aim is the intention that a school plant should be more than merely a place in which to attend classes. It should encourage the children's presence at all hours of the day, helping to make school a more attractive part of their lives and thereby helping to encourage the desire to learn and to grow with that learning.
17 November 1952
Cambridge, Massachusetts

Pietro Belluschi, Dean
School of Architecture and Planning
Massachusetts Institute of Technology
Cambridge, Massachusetts

Dear Dean Belluschi:

The report for my thesis, a SCHOOL HOUSE EXPANSION STUDY, is submitted herewith in partial fulfillment of the requirements for the degree Master in Architecture.

Respectfully yours,

James Wood Burch
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During my initial efforts to settle upon a particular school building problem for my thesis subject, I was fortunate in having the advice of some eminent professional people. I shall not include in this report the range of information or description of the instructive experiences for which I am indebted. I sincerely thank these people for their considerable efforts in helping orient me toward problems of handicapped children and education:

JANICE RAFUSE, M.D., Supervisor of Clinics, Services for Crippled Children, Massachusetts Department of Public Health

DOROTHY A. OATES, Supervisor of Physical Restoration, Division of Vocational Rehabilitation, Massachusetts Department of Education

H. DALAND CHANDLER, Architect

L. C. ROY, Architect

BASIL CASTALDI, Ph.D., and WILLIAM B. BLACK, School Plant Specialists, Massachusetts School Building Assistance Commission

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NORTHWEST CORNER.
POINT OF CONNECTION
TO ENCLOSED PASSAGE
OF PROPOSED ADDITION.

PROPOSED ADDITION—
AS SEEN FROM SOUTH.
It has been my desire to design for my thesis a school building that presented new and interesting problems to me. After a broad search, I stumbled into a made-to-order situation. My problem is the problem of the Massachusetts Hospital School.

The Hospital School at Canton, Massachusetts, is the home of 150 seriously crippled children. Their school building, containing 6 classrooms, is a pleasant little structure that has been badly outgrown. Miss Brayton, the school principal, obliged me by having put on paper, long before my arrival, an orderly summary of the additional space that her children need if they are to have something like the schools their non-crippled brothers and sisters attend.

My study of this problem involved three important aspects, and in this report I shall discuss them as (1) a general consideration of the problems of crippled children, (2) the Massachusetts Hospital School, and (3) my proposal for expanding the school house.

I. A GENERAL CONSIDERATION OF THE PROBLEMS OF CRIPPLED CHILDREN

Despite their handicaps, crippled children retain potential abilities that can and should be brought to fruition. For their sakes we want this. And it is to the community's advantage. To help them overcome their handicaps and become as self-sufficient and productive as possible, the three aspects of life - the soul, the body and the mind - must be nurtured. Let us consider first the body and the mind - the medical and educational needs.
Children become crippled as the result of accident, or of disease, or of congenital deformity. When the effects are serious, the efforts to restore their bodies require long and specialized treatment. This necessary care demands facilities with which the ordinary hospital is not equipped.

Further, their physical handicaps make it difficult and often impossible to attend school along with non-crippled children because

1. Locomotion is difficult.
2. Physical impairment attracts the unwanted attention of curious non-crippled children.
3. Loss of certain parts makes difficult such acts as writing and speaking.
4. The residual effects of some crippling diseases tend to retard the speech or to make more difficult the learning of some one subject, such as mathematics or language, even though the affected child may prove to have adequate intelligence.

For these and other reasons the need for a special school plant for crippled children becomes obvious. This is necessarily a more complex plant than the ordinary public school. If operated by a metropolitan center, there is the additional expense of transporting the children to and from school, while, if it serves a larger area, a boarding school is necessary, with all of its consequent living, dining, recreational, medical and maintenance facilities. In either case, day or boarding school, the educational plant for crippled children is more expensive than the ordinary school plant because its population requires an increased measure of care and supervision, smaller numbers per class, more floor area per child, wider corridors, etc.
The care and education of handicapped children is a costly program. Against this fact, however, it appears fairly certain that the community at least breaks even on its investment - by the economic contributions of productive adults who began life as crippled children. A physically handicapped person, educated and trained to perform a job within his capabilities, can be made self-sufficient and, in many cases can be, and is, a family provider.

With the validity now established of a special program for crippled children, what are the areas of activity that must be included if that program is to approach effectively the needs of soul, mind and body?

To be of greatest value a program for crippled children should provide:

1. Medical care.
   a. Surgery and medication toward alleviating the physical handicaps.
   b. The study of limitations resulting from the various infirmities to which children are subject in order to best adapt the educational and training program to their needs.

I have made an effort to put into figures an accurate estimate of the balance between the cost of care and education of the handicapped child against the taxes paid by him as a rehabilitated adult. I have omitted these figures because I am not sure of their accuracy; however, as far as they went, they indicated a financial gain to the public.

c. Physical therapy to lessen the handicaps either by direct strengthening of the affected parts or by compensatory strengthening of unaffected parts of the body.

2. Academic Program.
A program of studies at least equal to that of a good school for non-crippled children, with added emphasis upon the need to adapt the courses and the teaching to students for whom learning is made more difficult by their physical handicaps.

3. Training.
b. Domestic Arts.
c. Vocational training for occupations suited to the physical limitations of the children.
d. Occupational Therapy - mentally and physically therapeutic activities that stimulate the senses - the desire to do and to make - and which, at the same time, develop the child's ingenuity and encourage him to solve his own problems.

4. Recreational Activities.
a. Clubs and hobbies.
b. Music and dramatics.
c. Social gatherings and outings.
d. Physical recreation - games and sports with emphasis on their recreational aspects - forced exercise being of scant value.

5. Work Program.
Useful occupation of some form to increase ingenuity, resourcefulness and independence - tasks within the ability of the
child but requiring him to strive willingly. Simple assignments: each child make his own bed; cooperative bed-making; quarters policing and library assistance. In such a program the children may be more hindrance than help, but this is a necessary and valuable part of the growing-up process.

6. Psychological guidance with testing program.


8. The intangibles - attention to traits of character. The child should be encouraged, whether or not he is aware of the encouragement,
   a. To be independent.
   b. To be modestly self-assertive.
   c. To endure cheerfully and understandingly the unwanted sympathy of others.
   d. To move through life without being uncomfortably self-conscious.
   e. To realize that, while most handicaps are hidden from view, everyone has his handicap - no one has been perfectly endowed.

Many communities have, at best, inadequate programs and facilities for treating and educating crippled children. Where they have been provided, they must be constantly adjusted:

1. To new developments in educational processes - the adjustments being generally more difficult where crippled children are involved because these children cannot be handled so flexibly.

2. To the changes of social and cultural nature. As our society becomes more complex, the crippled person usually has a greater adjustment
to make than the non-crippled person, e.g., growing cities with their more rapid transportation complexes make it increasingly difficult for the crippled person to get about.

3. To new forms of physical impairment. With the progress of time, one type of crippling disease or accident will be succeeded by another in frequency, so that from one decade to another the medical and educational programs must be adjusted from, e.g., a preponderance of spastic children who walk with canes, to an increasing proportion of paralyzed children in wheel chairs.

II. THE MASSACHUSETTS HOSPITAL SCHOOL

To provide severely crippled children with all of these important aspects of home, school and hospital, a combination theretofor denied them, the Massachusetts Hospital School was founded in 1904 by enactment of the state legislature.

Instrumental in bringing about the enactment was the late Dr. Edward Bradford, Dean of the Harvard Medical School and Professor of Orthopedic Surgery, who, along with several of his contemporaries, felt that the previously established Saint Botolph Street School for Crippled Children in Boston, excellent though it was, lacked, as a city day school, the facilities for giving the severely crippled child the thorough development that he needed.
These men conceived the Hospital School as a home-school-hospital:

A. A home where a balance could be reached between the neglect, on the one hand, suffered by some crippled children in their natural homes and, on the other, the over-sympathy and debilitating care given to others; a home where crippled children could live, work and play in healthy competition with each other and thereby help themselves—strengthen their initiative, resourcefulness and self-reliance—instead of spending their early, more sensitive years vegetating under the cruel gaze of other curious children;

B. A school where, besides the necessary book-learning courses, there could be occupational courses adapted to the children's abilities, the integrated educational and training courses being oriented toward the special needs of these children to achieve a higher-than-usual level of social adaptability.

C. A hospital where the highly specialized and long-range medical treatment required by these children could be given them with a minimum of interruption to their schooling and their association with other children.

At the time of its founding the Hospital School was almost unique in its three-fold nature. "The whole program is designed to turn out citizens physically and psychologically able to compete with their unhandicapped brethren; to make a living and lead normal productive lives."

COMFORTABLE INFORMALITY, RATHER THAN INSTITUTIONAL GRAVITY, SEEMS TO PERVERSE ALL ASPECTS OF LIFE AT CANTON.

AT CHRISTMAS TIME THE GLEE CLUB BECOMES THE CHOIR
The policies of the Hospital School are set by a five-man board of trustees who are appointed by the governor and who serve without pay.

The policies determined by the trustees are effected by a Superintendent, a licensed physician, who is appointed to office by the trustees and confirmed by the governor. Those who have served the children of the Hospital School are in general agreement that the School has been extremely fortunate throughout its 48-year life in having been guided by trustees and superintendents of the highest caliber. There have been just three superintendents to date and, in the case of each appointment, the governor in office has been sympathetically sensitive to the recommendations of the trustees. This has produced a fortunate continuity of harmonious administration whereby the original conception of the School's founders not only has been maintained but constantly expanded and adapted to new conditions and developments.

Dr. John E. Fish, who served as the Hospital School's first superintendent, for almost forty years, combined his own love for and understanding of children with a clear comprehension of the intentions of the founders.

Through his inspiring example, the primary objective of the School has remained the development in each student of a positive attitude toward life, elimination of self pity, building of character, the knowledge that a happy, productive life "depends as much upon the person's mental outlook as it does upon physical rehabilitation".  

Toward this objective Dr. Fish was motivated by deep convictions. In his own words, "no form of

1 Gates, p. 7.
surgical care or other treatment can be regarded as complete which neglects the social, moral and mental growth of the child", and "it has been found that the placing of crippled children under healthy conditions, thus directly stimulating opportunities for play, study and amusement, tends to destroy any source of self-pity and teaches them to minimize or forget their disabili-

ties."1

The opening of the Hospital School was delayed for four years, until 1908, during which time the school plant was made ready upon a 165-acre tract of farmland at Canton, Massachusetts. The main buildings are situated around a level site overlooking Reservoir Pond and are so arranged that the children can move from one building to another on an almost level paved walk which surrounds a broad green.

The school is open only to children who are residents of Massachusetts. To be accepted, a child must be mentally competent. Those whose disabilities demand the greatest efforts toward rehabilitation are the first accepted. The school does not accept blind, deaf, epileptic or disturbed children as such, though occasionally it will admit a crippled child having one of these conditions in some degree. The children range in age from infancy to 21 years. At 21, the law requires that they leave, although many leave at an earlier age, upon completion of their schooling.

The Hospital School - A Home.

Excepting those requiring constant nursing care and those undergoing surgical treatment, the children live in cottages under housemothers. To make their living conditions as home-like as is practicable, no cottage houses more than 30 boys or girls. Each cottage

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1 Dr. John E. Fish - An Appreciation, Canton, Mass. Hospital School Printing Classes, p. 6-7.
has recreation space and kitchen and dining facilities.

Independence and self-reliance are stressed in the cottages, as they are throughout the School. Each child assists in performing household duties to the extent of his capacity, including the serving of meals in a rotation system. The children are responsible for the personal tasks of dressing and undressing themselves, getting into and out of bed, bathing and going to the toilet. For some children these acts present the greatest kind of problem in coordination and patience, both physical and mental. By cooperative efforts and mutual help they try to solve these problems for themselves. In fact, each time a new youngster comes to the school, the old hands in his cottage compete with each other in helping the new member learn how to do things for himself.

In one such case, a lad arrived, so paralyzed that he could use only the muscles of his neck and part of one arm. One of his most difficult problems was getting into and out of bed. This was a pretty tough one until one boy suggested a sliding arrangement. They got a strip of linoleum which they laid along one edge of the new boy's bed. Slowly he developed the strength and the knack for pulling himself, by his arm, from his bed cart, upon which he spent his days, onto his bed. In the mornings, he reversed the process, sliding back across the linoleum and onto his bed cart. Later, his schoolmates helped develop a prosthetic device which has enabled him to make a living by sewing.

What could be more effective than this spirit of mutual help in promoting ingenuity, self-reliance and comradeship?

New arrivals at the School who have only recently been injured or afflicted are often despondent--their worlds so suddenly crushed. In the worst cases the efforts of nurses, doctors and teachers have little
or no encouraging effect. But the mutual help, jocularity and self-reliance of the other children have been powerful restorative forces and perhaps the only effective treatment.

In the cottages and throughout the School visitors will notice that few special things have been provided to assist the children in getting about. They learn to open doors for themselves, to drink from ordinary drinking fountains and even to handle stairs as much as possible, in order that they may be well prepared to go into the world.

**The Hospital School - A Hospital.**

Some of the children, by the natures of their diseases or deformities, must remain at the hospital in order to receive the constant care and attention of the medical and nursing staffs, while children from the cottages occasionally must go into the hospital for medical or surgical treatment.

As mentioned at the outset, the variety of crippling effects which the children have suffered are the results of congenital deformities, diseases and accidents. These effects are classified generally by the medical staff in three categories, as disorders of bone, of muscle or of brain and nervous system. Separation between the categories is not always clearly definable and, of course, diagnosis of some of the ailments is still difficult or impossible - as it will always be.

The medical care program of the Hospital School was envisioned by the founders as a humane service, a service aimed at correcting deformed parts, restoring injured and weakened organs and developing the children's bodies so as to give them their maximal physical strength and flexibility. This may appear to be an axiomatic objective, but on either side of this aim lies a pitfall, one being lethargy, the apathy that
so often overtakes those in secure jobs, including
doctors, and the other, the exuberant temptation to
perform surgery, perhaps ill-advised, when so many
subjects can be had for crooking the finger. The
founders apparently sought to steer a course between
the secure lethargy on the one hand and the guinea
pig attitude on the other. The consulting physicians
of the school seem to be in general, but not complacent,
agreement that this difficult tight rope has been
walked rather well by the medical staff through the years.

Within recent years the School has sought
and received the approval of the American Board of
Orthopedic Surgery. As a result of this approval,
physicians who are working toward certificates of qual-
ification from the Board receive credit for work in
residence at the Hospital School. The Hospital School,
in concert with other hospitals, has established a
program whereby doctors remain in residence at Canton
for periods of six months to a year. This rapid turn-
over in resident staff brings to the Hospital School a
stream of new ideas and influences which is leavened
by mixture with the ideas and experience of a large
and excellent visiting staff of surgeons, physicians
and specialists from the Boston area. It is felt that
the visiting staff, enlarged and put on a paid basis
in recent years, has been more active and of greater
value than formerly, when it was a volunteer group.

All of the children are under constant super-
vision of the medical staff, and each child is reviewed
periodically at a clinic conducted by one of the visiting
surgeons. The clinics are attended by the resident
physicians and other members of the School staff, in-
cluding nurses, therapists and teachers who, after
each child's dismissal from the room, attempt to deter-
mine what can best be done to improve his condition.
STUDENTS CONSIDER SAFETY PROBLEMS DURING A RED CROSS SPONSORED CAMPAIGN

THESE LITTLE NIPPERS HAVE CONGENITAL DEFECTS. AT THE HOSPITAL SCHOOL THEY SHALL HAVE THE BEST OF ORTHOPEDIC CARE PLUS UNINTERRUPTED SCHOOLING.
Besides the medical, dental and surgical work, the hospital program includes physiotherapy and occupational therapy. The physiotherapy work, including heat, massage and electrical stimulation of affected limbs, plus hydrotherapy and exercise, has been contributory in graduating some children from wheel chairs to crutches, and others from crutches to canes. Compensatory efforts are made by the physiotherapists to increase the strength of sound limbs so that they can help do the work of weakened or paralyzed limbs. Devices such as stairs and ramps are employed in the attempt to prepare, for their futures in the world at large, children who have never been able to move themselves from one level to another.

The occupational therapy includes weaving, painting, clay modeling and other activities which, while giving valuable mental and physical therapy, have the added values of being recreational and artistically stimulating. Some creditable and sensitive painting is being done here today by one lad who has the use of only one arm. Another who is paralyzed from his neck down, executes gay and precise paintings with a brush held between his teeth; the merit of his work is indicated by the fact that he has a volunteer apprentice, a moppet who stands beside him on crutches and sets the brushes between his master's teeth.

The Hospital School - A School.

The school program at Canton, including both academic education and vocational training, has been constantly changed, adapted and improved throughout the years.

Further, the school is the center of many of the children's activities. The founders planned that the new institution should not only have within itself a feeling of community life but that the children
should enter, as much as possible, into the lives of other communities.

The school began early to make a reality of this intention by starting clubs, teams and traditional outings. Two of the earliest of these activities were the band and the baseball team which were organized by Dr. Fish. In their sports and other activities, as in their cottage duties, each child participates to whatever extent his limitations permit; thus "the legless pitcher who trained himself to strike out normal boys of the local schools will always be remembered, and so will the batter with artificial legs who was supplemented by an armless boy running bases."1

The extra curricular activities, adjuncts to the schooling program, undoubtedly help to give the Hospital School the happy atmosphere that visitors can not help noticing. Many of these activities are under the supervision of the teaching staff, who are, as devoted teachers always are, unselfish with their time and efforts. In the words of the School Principal, "We are very fortunate in having an understanding faculty whose main interest is the betterment of the physically handicapped child . . . . The teachers in the lower school each teach two grades, which means double preparation, and the teachers in the high school group each have six class periods a day besides extra-curricular work. The extra-curricular work is . . . hobby clubs . . . educational motion pictures . . . religious education . . . school paper . . . and other activities which take place after the school day is over."2

The school has instituted a training program for intern teachers, qualified teachers who need exper-

1 Dr. John E. Fish - An Appreciation, p. 8.
2 Margaret Brayton, Principal's Report for School Year 1950-51.
ience in teaching crippled children before embarking on their own careers in this field. Each year two or three teacher-trainees come to the Hospital School on scholarship for a year of practical experience. This program parallels the resident physician plan recently effected by the medical department and is affiliated with Tufts College, the year's work counting as one-third credit toward a Master in Education degree.

Dr. Nils Wessel, psychologist of the visiting medical staff and vice-president of Tufts College, called upon to appraise the school program in 1951, stated in his report: "The morale of the teaching staff is much better than the average for institutions of the type of the Massachusetts Hospital School. By and large, they possess, individually, a strong interest in the special problems of the children in their classes and a sincere concern for the effectiveness of their teaching."¹

Prior to being admitted to the Hospital School, a child must pass a psychometric examination in order to assure the school administration that he not only can benefit from the education program, but that he also can become a well-adapted and stimulating addition to the student body.

The educational program at the Hospital School has been constantly expanded and improved. Among the first children who entered the School, there were many who had reached adolescence without ever having had a single day's schooling. Twenty-five years ago it was felt that many of the children were physically unable to attend school for a full day. At that time each child attended class for only an hour and a half each day. In time it was found that most of the children could be adapted to longer school hours and, further, that they

¹ Principal's Report
needed more education if they were to become competitive citizens. The lower grades, accordingly, have been increased in recent years to full-day sessions, and the high school, which was added to the curriculum in 1946, has been on a full-day schedule since its initiation.

The high school curriculum is comparable to that of other high schools, and its graduates who have entered college have found themselves well prepared.

Even prior to the inception of the high school, Hospital School graduates have been readily able to continue with schooling. Twenty-former students have attended college, and twelve of these have gone on to do graduate work. To date 700 young adults have been graduated from the Hospital School, among whom are seven teachers, three legislators, two artists, three lawyers, a doctor, a nurse and a social worker. With high school now included at Canton, it is probable that the number who go on to higher education will increase, and it should be understood that work with the mind, not with the body, is the forte of these people.

Vocational courses, suited to the limitations of the children, have been important since the founders conceived the idea for this school. Courses in watch repairing, printing, cobbling and agriculture have been quite successful and the alumni roster shows the names of many men who have worked at these vocations for years, a number of whom own their own businesses. Several of the graduates are employed in working the school farm which produces much of the milk, meat and vegetables eaten by the youngsters. The boys in the watch repair and printing courses undoubtedly gain added inspiration from their teachers, both of whom have themselves overcome serious physical handicaps.

Sewing, cooking and dressmaking courses are available for the girls, and it is interesting to note that many of the women graduates have married and
GRADUATES OF THE WATCHMAKING COURSE HAVE ALL BEEN ABLE TO MAKE COMFORTABLE LIVINGS AT THEIR TRADES. THEY ARE ASSURED OF EMPLOYMENT. SOME OF THEM CONDUCT SUCCESSFUL BUSINESSES IN THEIR HOMES.
produced children. The domestic science courses, however, are equally valuable to the graduate who remains single.

An excellent commercial course is offered, including general business training, commercial law, shorthand, typewriting, bookkeeping and Civil Service preparation. This program was begun by Miss Brayton in 1929 as a stenographic course and over the years has equipped many young graduates to go directly into self-supporting jobs. The Principal's records show 98 graduates employed in clerical work. Many of the alumni have used their stenographic training as a means of livelihood while attending college or vocational school to prepare for a variety of careers.

In order that each graduate have a well-rounded background, students in the commercial course are encouraged to study some of the cultural subjects, while those preparing for college entrance are advised to take advantage of the commercial course.

In fact, the needs of each individual are considered carefully in all grades in order that everyone be prepared for his future as well as possible. This is no small undertaking when it is realized that these children are subject, not only to all of the intellectual and personality variations of other children, but also to as many aberrations of physical capacity as there are students - each case being different.

In line with the Hospital School's practice of encouraging or requiring the children to do all they can for themselves, the school, as a matter of course, has had every child attend classes who was not confined to the hospital. Even those who could be safely and sensibly moved from the hospital have been trundled over to classes on bed carts daily. This practice, however, has not been an inflexible rule and, for those who must remain with their nurses, the school has given
bedside teaching in order that no student fall behind his classmates in his studies. The school is flexible too in providing special kinds of teaching for any child who may need it, as in the case of one boy who is being instructed in braille after having lost his sight.

The faculty, under advisement of the medical department, schedules each child for some form of physical education in keeping with his limitations. For some children this may be physical therapy or special exercises, while for others, it may be sports: baseball, badminton, swimming and basketball.

Besides Catholic, Protestant and Jewish religious services, regular classes in religion are conducted for all three faiths.

Happily so, misconduct and obstreperousness are not absent at Canton, and the school council, composed of the principal, two teachers and eight high school students, convenes bi-weekly to consider school matters and review demerits.

As in other schools, these youngsters have clubs and activities of both recreational and educational nature, such as: French club, science club, glee club, school magazine and square dancing.

The dramatics group is quite active and successful. Besides its annual Christmas play, it presents a play to the public each year. Recently, in Quincy, it presented "The Man Who Came to Dinner" under the sponsorship of the Quincy Rotary Club. Proceeds from these well-attended public productions are applied to the needs of the Hospital School.

Trips and outings of any nature are a thrill for the children, and the school conducts as many as possible. Circuses, ball games and ice shows are musts, and the graduating class usually makes a day-long trip down the coast with dinner at a choice restaurant.
To an outsider, and perhaps to some of the children, the most glorious day of the year must be the annual Alumni Day, for not only does it mark the end of school but on this day the old grads come trudging in, two or three hundred strong in shiny automobiles with children in tow, and there is band music and refreshments and movies. The kids don't get to have dinner with the old grads, but that day will come.

Two years ago a Boston College student made a follow-up study of Hospital School graduates. One hundred graduates returned completed questionnaires, and the information derived proves the worth of the Hospital School. Eighty-five of the one hundred were employed at the time of the survey, while six others who had been employed were, at that time, constructively occupied in further study and training.¹

This lad has made his home at the hospital school for 6 years. Today he is a very bright first grader and runs happily about despite congenital absence of both arms and one leg.
III. PROPOSED SCHOOL HOUSE EXPANSION

In this problem I have made an effort to design more than a good learning environment. I have had in mind a pleasant arrangement of interior and exterior spaces through which the children could move, not just during class hours, but all through the day. I should like to see school houses not go blank at 3 P.M. but instead be active and encouraging places, even at night. I feel it is unimportant that they be made spic and span at 4 P.M., only to stand empty and stupid waiting for 9 A.M.

This addition should be not just buildings, but a group of places that would attract the children at all times, increase their enjoyment of school and possibly, thereby, help to increase their interest in school work — places which, while not luxurious, might be esthetically pleasant and so, help to increase the sensitivity of the people who frequent them. I have wanted this to be a place where the children would prefer to be. I believe that schools, like churches, should always be open. The Hospital School, in its secluded setting, offers this possibility.

At the same time I have tried to reach some compromise between these philosophical desires on the one hand and, on the other, an economically feasible design. This latter is an intangible and at best is impossible to define. An attempt at balance has been made by suggestions of simple materials, assemblies and structural systems. Much more could probably be achieved with further study.

As mentioned in the introduction, the program of requirements had been carefully composed by the faculty before I arrived upon the scene, and I herewith excerpt that program from the Principal's report for the school year 1950-1951:
VIEWS OF SCHOOL HOUSE
Physical Plant

There is a crying need for centralization of the school classrooms in one building. At the present time, the nursery school and kindergarten are housed in the old sewing room and the first and second grades in the old printing shop in the industrial building. The third, fourth, fifth and sixth grades as well as the speech classroom are all housed in the Fitzgerald Cottage. Both the industrial building and the Fitzgerald Cottage are wooden structures and are at some distance from the schoolhouse. The science classes are held in the rear of Morrison Hall, and the music classes are held in the library. With more and more children on bed-carts and in wheel-chairs, the problem of transporting children back and forth has become tremendous. Because of the interchanging of classes, from the seventh grade through the twelfth, the majority of high school courses are held in the schoolhouse, but there is much traveling back and forth to the science laboratory at Morrison Hall, the vocational building, and the library.

Two years ago, your principal spent much time in studying modern architecture for school buildings, and in cooperation with the members of the faculty, arrived at the following needs for the addition to the present schoolhouse. It must be remembered that prior to the erection of the present schoolhouse, in 1927, the classes were held in the old dormitories, and were anything but adequate. The present schoolhouse was a great step forward, but by building only six classrooms in the schoolhouse, the administrators did not
anticipate an expansion of the educational program. When I came to the school as principal in the fall of 1929, each child attended classes for only one and one-half hours a day, thus each classroom provided for three grades. It was soon demonstrated that such a program did not meet the time requirement for the children, and before long we were able to give each grade a half-day's time. This left us short of space when we held the music classes as well as the commercial classes in the schoolhouse. Four years ago when we started the high school program, we realized that an addition to the schoolhouse would be necessary, and since that time our teachers and students have been patient with the inadequate classrooms we have been able to provide, as they anticipate the building of an addition to the schoolhouse which will take care of this problem.

It would be shortsighted, indeed, to add to the schoolhouse and not provide adequately for the needs of our students and for the equipment of a comprehensive school, where physically-handicapped children may be taught under one roof without the terrific problem of transportation to and from classes to buildings an eighth of a mile apart. I suggest that the addition to the schoolhouse might continue with the main corridor in the schoolhouse west, to the road above the ball field, thence south and then east, back to the schoolhouse bridge, thus forming a quadrangle. The present schoolhouse was far ahead of the times in its modern structure, and I believe that a new modern building will
tie in without a noticeable difference in architecture. Perhaps a cupola over the center section might tie the addition in with the present schoolhouse. In order to provide for the needs of our children, and in order to have the requirements of an adequate school building, we ought to have the following:

**Auditorium**

To hold approximately 100 students, many of whom will be in wheelchairs and on bedcarts.

This will be used for educational motion pictures so must be arranged with inside shutters to darken the room. Should have platform with speaker's desk for school assemblies. Suggest sloping floor, sound-proof ceiling.

**Library-Study Hall**

Large enough to accommodate 30 to 50 students for studying, as well as 2,000 volume library.

**Laboratory**

One which can be used for general science and chemistry, as well as physics.

**Domestic Science Kitchen**

To accommodate ten students at a time, and placed near the schoolhouse reception room.

**Teachers Room or Reception Room**

Large enough for students to entertain at tea at least 25 people. Fireplace in room would add tremendously.

**Principal's Office**

Should be large enough so that students on bedcarts may come for consultations. Preferably on south side of building.
Stenographer's Office

Must connect with Principal's office, but must be separate for confidential work with students and staff. May be small, but large enough for desk and files.

Three Examination Rooms

These should be small, for use in mental testing, speech training, etc., done with individual children. No special outlook needed, as distractions should be at a minimum.

Nursery School-Kindergarten

To open onto play area, and have large sink in classroom, and private toilet facilities connecting with classroom. Walls of plaster so that murals may be attached or painted on them.

Arts and Crafts Classroom

Fitted up much as classroom in vocational building is, as we want to have these classes in the one building.

Woodworking Shop

Fitted with electrical woodworking tools and benches.

Music Room

Soundproof room, large enough to hold glee club of 50.

English Classroom

History Classroom

Mathematics Classroom

Language Classroom (French and Latin)

Science Classroom

Commercial Classroom (Shorthand, Business Law, etc.)

Office Practice Classroom (Typewriting, business machines, etc.)

Special Class Room (for speech, remedial work, etc.)

(Present six classrooms will be used for the first six grades)
Suggestions

Soundproof ceilings and walls as far as possible.
Plaster walls in classrooms, rather than brick or tile (if possible).
Chalk boards of white or pale green, rather than slate.
Wall space in classrooms for maps, etc.
Ample coat closet space.
Ceilings with non-glare fluorescent lighting, concealed.
Concealed radiators to avoid injury of children.
Individual lockers in corridor.
Water-cooled drinking fountains - low for wheelchairs, high for walkers.
Dark room connected with science laboratory for developing pictures.
Cupola to tie in present schoolhouse with addition.
Toilet for teachers connecting with Reception or Teachers Room.
Toilets for students connecting with as many classrooms as possible.
Tile for floors and colors for walls to be different for each room.
Bookshelves to be built into each classroom.
Ramps from classroom to play area for kindergarteners.
Larger than normal doors for wheelchairs and bedcarts.
If we have to have tile on walls, then please don't have buff color - rather a soft aqua color.
Bulletin boards in classrooms and in corridor.
The Commonwealth of Massachusetts may well take pride in its program for crippled children, as I am convinced from my visits to other such educational institutions for the physically-handicapped, that the Massachusetts Hospital School is one of the best in the country in its rehabilitation of the crippled child both physically, spiritually, educationally and vocationally. We are turning out good citizens who are able to make their way in the world through the understanding leadership of the staff at the school, headed by its able superintendent, and the unselfish cooperation of the Board of Trustees.1

Following initial discussions with Miss Brayton, in which we exchanged ideas and reached preliminary agreements, I submitted drawings of 5 different expansion schemes. She, together with the Superintendent and the Medical Director, gave each of these proposals generous and careful consideration. The resultant design is the development of the scheme agreed-upon as best meeting their needs and requirements, and into it I have embodied most of their suggestions.

Existing School House

The existing school house (built 1929) is an unusually pleasant building. Its scale is good and it fits very well into its setting. It has monitor windows that give good distribution of natural light, and the south wall is fitted with glazed doors on barn door hardware to open the classrooms onto a piazza and toward a pleasant view. The kindergarten-nursery school class and the elementary classes will be housed here.

1Principal’s Report
I have shown a small blister to be built at the west wall of the existing building to house the special facilities necessary to a kindergarten and, coincidentally, to act as a buttress to the existing west wall which is bowed outward at the cap.

Site

I propose filling the site to the piazza level along the south wall of the existing school house to provide two advantages: (1) a pleasant relationship between the indoor space and the school yard and (2) an ease of access to the outdoor space, a part of which is levelled to form a playground for the elementary school children. From there westward, the site is shown filled to give a downward slope toward the new classroom wings. This downward slope lessens the amount of fill required and provides the necessary slope for the auditorium floor, the auditorium being best situated in this central location.

Simple wooden benches and tables are indicated at several points in the school yard as gathering places. I should hope that occasionally such gatherings would turn their conversations to studies, hence the tables. But then -

The two ends of the existing driveway which is obliterated are used to provide access lanes to the building, one to the woodworking shop at the north side of the site, the other to a storage and utility room below the library at the south side.

Auditorium

The auditorium is not intended as a full-fledged auditorium but rather as a hall for school assemblies, simple dramatic productions, music programs
and educational motion pictures. I have also intended that the glee club practice here where they will be less likely to serenade classes in session.

The floor slope is a compromise between ideal vision of the stage and the children's ability to handle slopes. But visibility does not appear to have suffered noticeably.

The fixed seating along the axis is intended to give as many opportunities as possible for wheel chair drivers to sit next to pedestrian friends at assembly. The fixed seats are two feet wide in rows of four foot interval; these greater-than-usual dimensions are planned to accommodate a variety of postures. Further, no student must pass before more than three other seats if he should have to leave the auditorium during a program.

The floor, rubber tile on concrete, is terraced into seven rows. Each level is nosed with a low concrete safety curb which will, I regret, deny the boys the pleasure of bouncing down the auditorium in their wheel chairs during its unoccupied periods. From the aisles the floor must be warped into each row.

The space in each row not fixed with seats is intended to take a single row of wheel chairs and bed carts, in the helter-skelter alignment that I am sure the children would produce, and still leave adequate width for a wheel chair to pass behind each row.

The front and rear rows are shown clear of seating in order that they may serve as generous cross aisles. However, movable seating may be placed here, as in the other rows, with ample space remaining for traffic. Storage for movable seating is indicated under the stage. Exits are at the front of the auditorium to make emergency vacating a downhill process.
The stage and its ramp also have safety curbs. The toilets and dressing closets shown at the sides of the stage are for use in minor dramatic programs and as a necessity for those students who are destined to spend their lives close to these facilities but who, nevertheless, may be on stage during school assemblies. Access to the storage room below stage is provided by a stair from the front aisle and by a trap door in the stage. The storage space is intended, in part, to hold the film library.

I have not been able to harden myself enough to exclude windows from the auditorium. The two windows must be equipped with draw draperies or movable louvres to darken the room for motion pictures.

An enclosed passage connects the auditorium to the lower and upper schools, both of which will use it.

New Classroom Wings

The axes of the two new classroom wings parallel the axis of the campus which, it happens, was set at almost the ideal solar orientation for classrooms on a double-loaded corridor. Such orientation, I feel, is important despite the possible need for curtains during mid-winter. I advocate the joy of direct sunlight whether it splashes on the floor or just filters through the curtains. The louvres over the classroom windows extend as necessary to shield out the direct sunlight from about 9:30 A.M. to 2:30 P.M. in June.

The classroom wings are offset from each other to avoid the monotony of a long corridor. The offset occurs at a point where it will produce its greatest advantage as an acoustical barrier between those I assume will be the more quiet classrooms, and the less quiet.
Library

The library is at the extreme end of the quieter section and so located as to be easily accessible for evening use by the students. I feel the library should not be a relentless study hall, but a study lounge. While I have indicated space for serious work, I have also tried to provide for an informal, comfortable atmosphere that will attract students to it at all hours.

Classrooms

The classroom size was determined empirically. The school has about 140 students today, although there have been twice this number in past years. Two or three new cottages might double the present enrollment. (There is no dearth of applicants.) The land does not appear to be suitable for expansion beyond a capacity for 300 children at most, and it is questionable, to me, that more than this number should be in one such school anyway.

The site for the school house addition does not lend itself to development beyond this proposed expansion, so I consider it imperative to plan now for the maximum student body that seems possible. Of course, there is also the possibility that the school will never again have 300 children, and for this reason I have not attempted a fully-developed school for such an enrollment but have, instead, made it a little scant for 300 and generous for 150, by the following process:

In this decade the recommended optimum high school classroom provides about 30 square feet per student. My students, naturally, need more space.

If the enrollment were 300, and 16 of the 19 classrooms shown were in use at any one period,
there would be about 19 students per classroom. Adding only 10% to the above area allowance, my classrooms would, at maximum enrollment, accommodate 19 students at 40 square feet each - admittedly a snug fit. At present enrollment, however, the same classroom provides each student with 80 square feet. This figure compares reasonably well to the 100 square foot allowance in the school for crippled children recently completed at Fresno, California. The Fresno School, incidentally, is for younger children who move about more during their classes and consequently require more space.

Movable storage cabinets on casters and fixed open shelving are provided for student work. A double display case is indicated at each classroom, one section showing to the corridor, the other, to the classroom, with a movable divider panel so that displays on the corridor side can be changed from within the classroom. Below the display cabinets is a two-foot deep space for file and storage drawers. The storage closet next to the display cabinets is also two-feet deep and equipped with by-passing doors. In the front corner of each classroom is a small closet for the teacher's personal belongings. It is my intention that these storage and display units are identical and prefabricated to be set in place.

Hollow core wooden doors, armored, are indicated between corridor and classroom. These are double acting pairs of 2 foot-4 inch leaves. A single leaf is relatively light and wide enough for most pedestrian children to pass through with ease. The doorway depth of 2 feet-6 inches allows the doors to open without projecting into the corridor. Elsewhere in the building doors are generally 3 foot-4 inch wide single leaves.

Classroom heating and ventilating is accomplished with cabinet units powered by the existing central steam system.

Arts and Crafts

I envision the arts and crafts room as a place for the children to haunt both during and after school hours and to it I have assigned a large general space with north light. Lightweight panel partitions that can easily be moved are indicated. These may be used to subdivide the space for various activities or to set up display backdrops to form a small viewing gallery for student work.

Woodworking

Woodworking is shown in a separate structure, the only way to assure maximum possible acoustical isolation of machinery noises. It is located next to Arts and Crafts so that these two activities may be united as much as possible.

Court

The court provides an outdoor assembly area for the entire school but particularly for the high school students. The arts and crafts room and the science laboratory are located adjacent to the court in order that they might have the advantages of a cloistered outdoor classroom. The garden area around the court is intended for student gardening. These garden plots might be related to the adjacent biology classes and could be embellished with dancing cupids sculptured by the art students. If an outdoor study hall is considered feasible, this is the place for it, and the stage is intended for any use the school might want to make of it.

The ramp at the west side of the building is intended for emergency use and for access to the athletic
field. The veranda below the library is an adjunct to the athletic field and might serve as a rendezvous.

To restate my intention, I have sought, in this design, to reach a compromise between esthetic-sociologic requirements, on the one hand, and economic considerations on the other. If I have veered from this effort at compromise, it has been toward the expansive, preferring to make my solution to the problem more complete rather than show something less than I should like.

This project has been both educational and inspiring to me. I hope it will help the Staff of the Hospital School to develop their ideas toward criteria of what they will want to achieve when they finally acquire the school which they need and deserve.
Afternoon spin on a homemade scooter. Today this young man has a responsible job, a wife and three children.
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MASSACHUSETTS

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