The Physical and Mental Examination of Public School Pupils in Chicago

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The department of child study and pedagogic investigation was established in the public schools of Chicago September 6, 1899. It owed its being and inspiration to the zeal and insight of Dr. Walter Scott Christopher, a physician of more than local reputation in the treatment of children’s diseases, who believed that the problems of teaching and governing children must be approached from the standpoint of the child who is to be taught and trained.

Quite a number of years previous to his appointment to the Board of Education in 1898, the problems of children’s life which he wished solved were before his mind, and he foresaw the desirability of attacking these problems by scientific methods. He was also aware that the only persons who can satisfactorily handle school questions must be those who have the right of way into the places where children work and play, so that the prevailing and pernicious forces and factors in school life which prevent normal growth and development may be studied to the best advantage. He was conscious of the fact that this end could not be attained until something more than the school room life-record was at hand. He wanted to have a scientific whole life history of the child. Accordingly in an address delivered before parents and teachers and printed in The Child Study Monthly for January, 1896, on the subject The Children of To-day, we find him saying:

there is indeed a strong probability that these little ones differ from their elders physically, intellectually and morally in kind as well as degree. The mere probability is not enough. We must know positively its truth or falsity. The methods of modern science have pointed out the way. Experimental research can solve the problems. A child study laboratory must be established in which the child as an entity shall be studied.

While serving as a member of the committee on the normal school he asked the privilege of appearing before the members of the committee on physical culture to present a plan for studying the physical condition of school children and at the regular meeting of the Board of Education February 8, 1899, the recommendations of the committee were adopted and at its meeting two weeks later the board appointed two teachers who had special training, for the trial work, and appropriated a certain sum of money for the purchase of apparatus, so that on March 6, 1899, the preliminary work of investigation was actually begun. While the main object of this special commission of investigators was a re-consideration of the general problem of the relation between physical status and mental efficiency, the specific topics which they held before themselves and which they attacked, more accurately reveal the aims and ideas which the committee in charge of the work considered of importance. These topics referred to such matters as the following: the physical differences observed in children who are taught in the same classroom; the course of physical power of the children during the school day; the educational merits of nature study, music, drawing, constructive work, manual training; the comparative value of half-day and full-day sessions for young children; the problem of the backward child and the truant; the ungraded room.

The Advisability of Child Study Departments. The preliminary report of the investigation created such a widespread interest and enthusiasm that the committee considered it highly desirable to have the work extended in scope and as this would entail the necessity of continuous study of these and kindred problems from year to year, the idea of the promoters ripened into a desire to establish a permanent bureau of information on such matters. Accordingly, we find the committee re-
porting to the Board of Education September 6, 1899, the results of their deliberations upon the value of the four months' work of the special educational commission. The board at its meeting July 26, 1899, authorized the appointment of a special committee to consider the advisability of establishing in the school system of Chicago an independent department for child study and pedagogic investigation. The special committee so appointed, whose personnel was the same as that of the present standing committee (W. S. Christopher, F. J. Loesch, C. Meier, Clayton Mark, Joseph Stolz) actuated by the results obtained in the preliminary investigation, submitted a report to the board at its meeting September 6, 1899, which was adopted without amendment and from which the following extract is taken:

There are many problems in pedagogy and child life, the solution of which can throw much light on educational procedures and materially assist in the school work; it is also desirable to have in the system a mechanism to determine, when possible, the relative value of various pedagogic methods; the varying educational needs of our large population with its great diversity of nationalities and social peculiarities, should have accurate investigation by scientific methods; the great problems connected with dull and backward children call for earnest investigation; the type of child to be found in the parental school should also be considered. From these and other considerations, we believe that there should be in the school system a department for the investigation of educational and child-study problems. The work of such a department should be lim- ited to such of the various problems as may arise, as have distinct pedagogic bearing and educational value; its work should be conducted in accordance with approved scientific methods, especially the methods of physiological psychology. It should be its duty to make such investigations in child-study and pedagogy as may be suggested by the head of the department and approved by the superintendent of schools and the standing committee in charge of the department. We recommend to the board for its adoption the following:

"That there be and is hereby established in the school system of Chicago, a department of child-study and pedagogic investigation consisting of a director and such assistants as may, from time to time, be appointed to make such psycho-physical and allied investigations having a pedagogic bearing as may be suggested by the director and approved by the superintendent of schools and the committee in charge of the work; and also to give such instruction to the principals and the teachers in the schools as may be directed by the superintendent of schools and the committee."

We give the following brief outline of the objects and functions of the department of child-study and pedagogic investigation:

I. Research Work.

(a) Collecting anthropometric and psycho-physical data for the purpose of establishing norms, and for determining such relationships as may be of service in pedagogy.

(b) Applying accurate scientific methods to specific pedagogic problems, particularly methods of teaching and determination of the pedagogic value of various studies.

II. Examination of individual pupils with a view to advising as to their pedagogic management.

III. Instruction to teachers in child-study and psychology.

It soon became apparent in the endeavor to carry out this program that a permanent office and working-room should be maintained for the service of these employees. Accordingly on April 4, 1900, the board authorized the establishment of a psycho-physical laboratory in the department and appropriated a sum of money for the purchase of additional apparatus. This was at first located in an unused store-room connected with the central offices of the board, and on its removal in May, 1902, to more commodious quarters, the department was assigned a room on the same basis as the other special departments of the Board of Education.

How the Work Started.

It will thus readily be seen that the duties and activities of the department naturally have taken two main channels centering around the more or less distinct functions of: (a) Scientific investigation; (b) The practical application of scientific data to concrete school and social problems. That the department for the three years of its existence laid more emphasis on the first of these procedures was due not so much to choice as to necessity; for, as announced in the introduction to the first general report, it seems but natural that the starting point for a systematic pedagogical study of Chicago school children should be an attempt to determine the laws of their growth and mental development.
If children are to be tested and examined there must be some criterion or standard of reference by which the status and defects of any child examined in the laboratory can be precisely evaluated. It was then a necessity for the department to have at its command a set of norms, or measuring-rods, of the physical growth and mental development of children so that differences of kind and degree might be readily discovered and described, and to this task the department at once directed its attention.

Norms of physical growth were at first secured. These referred to such definite and easily ascertainable data as height, height-sitting, weight, endurance, strength, lung-capacity, voluntary motor control, visual and aural acuity; and as these were taken upon a large number of children for each age between six years and eighteen years inclusive, it is believed that the data is fairly representative.

After the rate of annual and semi-annual increase in growth and development were determined by these various indices, the correlation of the physical and the psychical was attempted. In order to deal satisfactorily with this general problem of school life, one must have, of course, a safe criterion of the indices of mental efficiency in addition to a precise statement of a well-grown and a well-balanced physical equipment. In the first statement of mental efficiency, the department took the school standing of the children by grades as an index of "general intelligence." It was of the opinion that while inability to grade regularly in school does not in each case indicate the lack of native capacity, nevertheless the school-standing might be adopted as a matter of expediency until norms of mental growth could be established.

It was in point of fact the correlation of school-standing with height and weight, made by Dr. Porter in his investigation of the school children of St. Louis in 1892, and the alleged coincidence of superiority in size and school advancement, that assisted in giving more definite form to the ideas of the members of the original committee and that intensified the desire to give the experiment greater scope and precision by adding more vital and specific marks of mental capability and by employing a greater variety of indices of physical status and change than had heretofore been employed. The inaccuracy of school-standing as a measure of native mentality is due to many factors. The repeated failure, however, of a child to advance with the great majority of children of his own age is at least presumptive evidence that a situation prevails which requires investigation, and of course this non-adaptivity may indicate the presence of great individual peculiarities in the child, defective sense-avenues, deranged motor connections, and so on, or on the external side, the lack of uniform conditions in the school-room, viz., of being in school regularly with teachers of at least average ability.

As an experiment in the first stages of the investigation there was added to the stated position of children in school grades, an estimate made, independently of the examiner, by the teacher of each child in such mental functions as attention, memory, judgment; and further, a statement of the child's best school study, his poorest subject of study and his school deportment. While this has always been required of the teacher of each child examined by the department and such data has uniformly proven valuable to the examiners in the diagnosis of cases, it has never been shown that it yields readily or safely to scientific computation.

The conviction soon was forced upon the examiners, by the large number of cases of mis-fits encountered, i. e., the non-adaptivity of children to prescribed courses, that the failure to make regular school progress ought in itself to be measured and evaluated. Consequently, it became an indispensable desideratum to have in an adaptable form, norms or indices of mental development throughout the school years. Before any so-called practical application of such data should be made, measurements ought, in strictness, to be sedulously carried on for a number of years on large numbers of children representing all grades, and possibly
also on a smaller group of children, each one measured semi-annually from the
time he enters the elementary school at
the age of six years, until he leaves the
high school. The department, however,
secured data on a few reliable and rep-
resentative mental functions, such as per-
ception, memory, association, attention,
imagination and judgment, on relatively
small groups of children, and these have
proven perfectly workable for its practical
purposes and problems and are being
gradually expanded and verified.

Even with such definite denominators
at hand, it must be remembered that the
examiner of children is under the neces-
sity of supplementing his measuring-rods
by a complete family history of the indi-
vidual, including such matters as the
child's inheritance, his health record and
the rate of development of his fundamen-
tal life activities. With a scientifically
determined and properly adjusted code
of physical and mental norms secured
from thousands of children, experience
has shown that the examiner can safely
measure by comparative position any
child who is under observation and out-
line the probabilities of his attaining the
growth and power which the strands of
his inheritance make possible.

Having at command a few representa-
tive norms, and with the expectation of
these being increased in number and com-
plicity as the work progresses, the de-
partment has taken upon itself more and
more of the practical work, with the hope
that when once this feature of its duties
is gotten under control, much more time
can be again given to distinctly scientific
research. This transition to the practi-
cal work was gradual and has its own
history, into which it is not necessary to
enter in detail. The first school-room
problem, undertaken in the second year of
the department's existence had refer-
ence to school-hygiene. We were asked
"to determine what sizes of desks are best
suited to the pupils of each of the dif-
ferent grades, and what proportion of the
desks should be adjustable." Another
problem of similar nature was an effort
to determine the course of power through-
out the school-day of pupils doing regu-
lar work, so that the most difficult tasks
could be assigned and the most exhaust-
tive work expected of pupils at those
periods of the day when the storage of
energy is at its highest.

The investigations soon
took on a more pedagogic
character. An examination
of visual constructive imagination was
undertaken with a view to securing some
definite information concerning the power
possessed by pupils in the upper grades
of the elementary schools and the lower
grades of the high schools to conceive and
construct objects and relations in the ab-
sence of these objects or of conventional
symbols. Again, the vexing problems of
spelling were attacked and an analysis
made of the usual abilities of school chil-
dren in this exercise, and of the ways
of teaching spelling, as these are related
to the different kinds of memory and to
the methods of study which make de-
mands upon this mental power.

Another problem upon which the de-
partment undertook to throw some light,
was a consideration of the comparative
value of oral and silent reading of chil-
dren as a means of getting information
during their first years in school. In the
transition that takes place in the knowl-
edge-getting processes from the natural
conversational methods of the child's
early home life, to the artificial ways of
school life wherein the child's interlocu-
tor largely appears in "cold type," it was
found that it is unwise and unsafe to
rely wholly upon silent reading in getting
acquainted with the stores of information
which society as incorporated in the
teacher considers worth while.

Further, along the same lines of in-
vestigation, the school-problem of writing
was examined. It was found that the
only style of writing more or less strictly
taught in the Chicago school system, the
vertical writing, was rather quickly aban-
don ed by the children as soon as it came
well under control, and the attention of
the pupils naturally became deflected
from the symbols to the symbolized. This
is largely what obtains in mastering any
human activity, but it was found to be
so particularly patent in such a relatively
simple series of human movements as
writing, that the attempt to foretell and define its path of direction was considered especially valuable for teachers of writing, and that it was worthy of having attention drawn to this change from the vertical writing to certain forms of slant writing, even during school years, was demonstrated by the fact that the suggestions and recommendations of the department were, some two years later, virtually adopted throughout the entire city.

Along with this change in the character of the subject-matter investigated, has come about a remarkable increase, year by year, in the number of children who are given a psycho-physical examination by the department, so that this extremely practical pedagogic function has become more and more exciting. Such an examination should be given to every child in the schools at least once a year, but as this is wholly beyond consideration for obvious reasons, the only feature of such an examination for all children with which the department is concerned is the supervision of the annual testing of the sight and hearing of the elementary school pupils. This preliminary examination is given by the teachers in the schools and such children as are suspected of suffering from defects or disorders of these sense-organs, are subsequently sent to the laboratory for further assistance and come under the heading of special cases.

In general it may be said that the following kinds of cases are brought to the laboratory or are examined by the department in the schools. First, normal bright children sent by the school principal or more often brought by the parents of the child. These may be precocious children whose natural curiosity or the imposed school course of study and home régime may seem to make too great demands upon their physical strength and well-being. In such cases recommendations and suggestions are made to the parents or guardians pointing to the causes and to the possible measures which can ordinarily be adopted to remove or ameliorate conditions. Again certain children may have failed to make satisfactory progress in certain studies and they are brought in to the central laboratory to determine the physical or mental causes of these special deficiencies. Many parents, principals or teachers bring in children to learn the nature and extent of their sensory defects. If these children require more attention than the public office affords and their case demands medical or surgical treatment, they are referred to the family physician or to a public dispensary.

The second group of special cases which come to the attention of the department forms the rather large number of sub-normal children. These may be found on examination to be of so low a grade of mentality that they are only slightly removed from the second or higher grade imbeciles. If such happens to be the case, the department in its report to the superintendent of schools, submits the data and recommends that inasmuch as they are practically custodial cases and invariably prove a great source of anxiety to the zealous teacher, and as they form a distinct detriment to the progress of the other pupils of the room as well as present an economic loss and waste of energy in the teaching machinery, the school management committee protects the other pupils by formally excluding them from the schools under its charge. The department, through its informal connection with the Children's Hospital Association and the Bureau of Charities, exerts its good offices in behalf of the parents or guardians of these children with the object of having them admitted to the public institutions of the state or to private organizations adaptable for such charges. It is our great misfortune that the number of such available institutions is so small and the accommodations are so limited that only a very small proportion of the total number of such cases can be satisfactorily cared for. If, on the other hand, these sub-normal children are discovered to possess such a degree of mentality as to warrant the hope that at the age of fourteen years they will be able, with special training, to complete the equivalent of the fourth grade, they are sent on our recommendation, to the ungraded rooms for sub-normal children,
which rooms form an integral part of the public school system of Chicago. On each child, so disposed of, a special and simple report is sent to the teacher in charge of the room, detailing and describing the peculiarities of body and mind and suggesting methods and devices by which his special needs can be met. It should be noted that these children are usually classed with the so-called backward children. It will, however, be found upon a careful examination of such a general group that although all sub-normal children are backward in attainments, the converse does not in the same sense obtain. The sub-normal child may be arrested in development, or retarded in mental unfolding, or of unbalanced mental growth, which conditions only superior care and special training can ameliorate; whereas the backward child who is found at or above the fifth grade at the age of fourteen is a recoverable case in the full sense of the word and usually is reached by a concentration of the same forces and pedagogic arts which are successful with the average normal child. This may necessitate the placing of a smaller number of children together and of making certain provisions so that the specific causes of backwardness in each instance may be known and successfully combatted.

The next group of special cases which the department examines is made up of deaf children or children with very defective hearing. Each child who enters one of the rooms for the training of deaf children undergoes a psycho-physical examination, and if the child is normal in mental equipment and is found to be deaf, or so defective in hearing as to be practically deaf, the case is reported to the superintendent of schools in the regular order, and the child is admitted to one of the rooms in the regular day-schools for deaf children.

Again, all children on whose behalf parents or guardians make request for admission to the rooms for crippled children must be examined by the department in addition to the regular examination given by the school medical inspector. The inspector determines whether the child is a cripple and requires the free service of a bus to carry him to and from school, and the department decides whether he is mentally capable of profiting by the instruction which the Board of Education gives in these rooms.

Further, the department has a special branch of its work conducted at the parental school so that every truant and incorrigible child is given a psycho-physical examination at least twice during his term of residence, first at or shortly after his admittance to the school and again before he is paroled. The examiner further assists the corps of instructors and family officers in studying the peculiarities of each boy.

Finally, the practical work of the department extends to children who are brought into the Juvenile Court. During the first week of February, 1905, the judge of the court, in his endeavor to gain all the information possible about these little charges, sent over to the laboratory of the department, two children whose conduct and appearance raised certain suspicions relative to their sanity and normal physical status. That the report to the court on the psycho-physical examination which was given to these cases had contributed something of importance may be inferred from the fact that in the succeeding seven weeks nearly seventy cases were examined and reported on. The department cannot at present handle all the cases of delinquency, dependency and truancy in which the court is interested, but it willingly co-operates in special cases with this civic body, in attacking a problem with which it has at bottom so much in common; and further it is the present plan of all interested parties to have a regularly established branch of the department in the new juvenile court building, so that the mental and physical status of each child may be thoroughly investigated before a final disposition of the case is made.