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The Massachusetts Medical Society.

PAPERS READ BEFORE THE ANNUAL MEETING OF THE SOCIETY, JUNE 9, 1920.

PREVENTIVE MEDICINE IN ITS RELATION TO SCHOOLS.

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THE keynote of this session of the Massachusetts Medical Society is "Prevention," and the old adage, "An ounce of prevention is worth a pound of cure," might well be taken as the text of our morning discussion. It reflects the trend of the times: Conservation and Prevention in all phases of modern life. In our own special field, of medicine, this trend is wide in its scope and seeks to protect the human individual practically throughout his life cycle: from the earliest possible time after conception continuously throughout the active part of his adult life. The trend is manifested by three active movements: Infant Welfare, Medical Inspection of Schools, Industrial Medicine. The first two are devoted to the care of infants and children—"Preventive Pediatrics"; the third concerns itself with adults.

Infant Welfare seeks to promote the health and development of the new individual by care

of the pregnant mother during her pregnancy, labor, and confinement, by the care of the infant after birth up to two years of age, and recently by the more forward-looking organizations up to the fifth or sixth year.

Medical Inspection of Schools seeks the welfare of children by protection against contagious disease, by the promotion of good health and proper development.

Finally, Industrial Medicine seeks to protect men and women engaged in the manifold activities of our modern complex and intensive life by study of their bodies, fitting the individual to the job, and by the establishment of hygienic surroundings conducive to health and consequently to greater efficiency.

Thus modern medicine is seeking through these three comprehensive movements to promote the health and happiness of the human race, both as individuals and as communities. In all the movements the keynote is Prevention. This paper deals with the second movement, Medical Inspection of Schools, conceived of as a measure of preventive medicine.

Medical Inspection of Schools is of a two-fold nature: contagious and developmental. The movement started with the first as its objective and was an attempt on the part of the community to protect itself against contagious disease by exercising medical supervision of pub-

lie schools, rightly recognized as the chief disseminators of such disease. It is thus communal rather than individual in its nature. Out of this first or contagious side of the subject grew the second or developmental part of the work. The latter is an attempt to promote the proper growth and development of the individual child during his school life by constant study and investigation of his body, and by the education of the child himself in the care of that body. It is individual rather than communal in its nature. The contagious side of school inspection is now thoroughly understood, is firmly established and has the hearty coöperation of home, school and government. The developmental side of the question, however, is not so well understood, nor is its importance generally appreciated by either home, school, the medical profession at large, or town and city governments. It is the purpose of this paper to discuss only the developmental side of school medical inspection, touching briefly upon its necessity and outlining a plan for its application.

The necessity for a more widespread and thorough medical inspection of schools is well known to those familiar with the physical condition of the young of our country. Exact knowledge as to this condition of the 22,000,000 schoolchildren of America is not available inasmuch as no comprehensive survey of large numbers of these children has ever been made; but that there is something radically wrong with far too large a proportion of them is now being realized, due, partly to the teachings of pediatricians and other workers in child-life, partly to the reports of the draft examinations in the war.

The pediatrician has known for years of the existence of large numbers of mal-nourished and under-nourished children whom he has encountered daily in hospital, dispensary, and even private practice. Recently he has had the opportunity of learning the "end-results" in some of these unfortunate children—an opportunity furnished by personal experience in the army and by draft reports already mentioned. Experience in the Medical Corps of the Army produced upon the mind of the pediatrician certain vivid impressions; perhaps the most striking of these was the acute sense of "too late," as he observed certain phenomena: in his own wards numerous troops with poor general development and marked physical defects;

in the surgical wards, the reparative work of his surgical confreres; in the camp-at-large, the drilling in corrective exercises and gymnastics by "developmental" battalions. He recognized in these cases of mal-development, in these physical defects, the "end-results," the sequelae, of conditions remediable in early life. Then came the reports on the draft board examinations showing 35% or 40% of rejections on account of conditions which again he knew were present and remediable in early childhood. The constantly recurring thought was, "Too late. How did these thousands of youth arrive at this comparatively late age in such a physical condition? How prevent this in the future?" The answer was simple and obvious: Discover and correct these conditions in early childhood, or even in infancy. But how reach those millions in order to make any impression on the child-population at large? Again the answer was obvious: By organized effort, acting through agencies already at work on the problems of child-life, *viz.*, infant welfare, medical inspection of the schools. By the extension and more intensive application of these two movements to constantly widening fields throughout the country, it was conceivable that large masses of infants and children could be reached and studied, defects removed, proper development promoted; resulting ultimately in a more healthy and vigorous American stock to fight the battles of adult life, whether of war or more happily of peace.

We are concerned here only with the elaboration of a plan for the care of school-children. Such a plan must be broad and comprehensive in its scope, must be based on certain general principles. Its object being the care of the child's body throughout school life, it must provide, first for the study, and second for the development, of that body. It may provide for study of the body by repeated physical examinations; it may promote development by training the child in proper care of the body and by coördinating home and school influences. The plan thus involves physical examination, education, and organization.

1. **Physical Examination:** This examination seeks knowledge of the child's body, both generally and locally; generally, in regard to the nutrition as a whole, as manifested chiefly by weight and height; locally, with special reference to the condition of certain anatomical parts of the body, *viz.*, the eyes, ears, nose,

throat, teeth, glands, chest (external), heart, lungs, spine, and feet. It should be made upon all pupils at least once a year. In addition to this general examination of the school population as a whole, two groups of pupils need special investigation, *viz.*, the athletes, and the backward or defective children: the athletes to guard against over-exertion in the more violent sports, such as football, basket-ball, rowing and track; the backward children, to determine causes, if possible, and to classify.

The examination having been completed, abnormalities or defects, if present, should be reported to the parents, with the advice to consult the family physician for treatment and management. Two such reports are to be made: one, written, by the school physician; another, oral, by the school nurse in her "follow-up" work. Finally, the results of these examinations and reports should be recorded carefully, the records passed on from grade to grade with the rest of the pupil's school history, due weight being given to this particular part of his record as a whole in the matter of class-work, promotions, participation in sports and other school activities. The record for the complete school course, from kindergarten through high school, may be kept on one card and should cover the physical condition of the pupil from beginning to end.

2. Education: "Knowledge is Power." The education, taking the term in a broad sense, is necessary for both children and parents. With the child, it should consist of daily instruction in physiology, general hygiene, or certain principles of right living; with the parents it may consist of conferences, general and special: general conferences with groups of parents, such as Parent-Teachers' Associations, at which are discussed the general principles of school medical inspection, its aims and object; at which also, helpful criticisms and suggestions may be made. Special conferences over the individual child should be held, a "consultation" of home and school; the home being represented by the parents and family physician; the school by the principal, grade teacher, school nurse and school physician. (I have known personally excellent results follow such consultations.)

3. Organization: It is obvious that if the plan thus briefly outlined is to be carried out successfully, careful thought must be given to the arrangement of details. The general super-

vision of the work should be in the hands of a physician, preferably a pediatrician, as "medical director" or "school physician." The work is done partly within, partly without the school: "Intra-School" and "Extra-School."

"Intra-School": The medical director must provide for the examination of the pupils and the keeping of the records. He should also take cognizance of matters touching closely the health of the pupils during school hours: the heating, lighting, ventilation of school buildings; the sanitary arrangements, the school lunches and playground activities; and in the capacity of consultant may render valuable help to the grade teachers, the teachers of physical training, of domestic science and to the dietitian, in their respective spheres.

"Extra-School": Here the medical director will find the success of his department dependent upon the spirit and attitude of the home, and his work greatly facilitated by the coöperation of certain community organizations.

The Home: It is of course vital to have the hearty and sympathetic help of the parents; they are and should be the final authority in deciding what shall be done to the bodies of their children, and in arriving at such decision they may be urged by the school to seek the advice of their family physician. The success of this part of the work depends largely upon the tact and general character of the school nurse and the way in which she does her "follow-up" work.

Community Organizations: The second "extra-school" agency which the medical director may use to attain results is the group of community associations now existent in all American cities and towns, associations moved by a civic conscience, with a desire to render social service to their fellows. They were in existence, of course, before the war, but their number was greatly increased and their civic spirit quickened by the war, and there is now happily a marked desire on the part of many of them still to "carry on" and to apply their energies to the problems of peace and reconstruction. The director of school medical inspection will find in these community organizations invaluable help in the discharge of his responsible duties. "Intra-School" they will supply "volunteer workers" who will assist him in the manifold details of the examinations; "extra-school" they will supply transportation for nurse and pupils: for the nurse in her

house-to-house visiting; for pupils who must attend special clinics: eye, throat, dental, orthopedic or nutrition.

Curves showing grade by grade the percentage of boys (black line) and girls (dotted line) who are 10% or more below the average weight for their age and height.

The general principles of procedure thus briefly outlined have been carried out by me recently as medical director of schools in a suburban town. We have just completed our first year. The results have not been analyzed, hence a comprehensive report cannot be given at this time. It is possible, however, to give a brief summary as to the nutritional condition of the pupils studied. The total number examined is 1552; of these, 618, or 39%, are below the average weight of American children of corresponding age and height;* in most of these children the degree of nutrition is not severe; but in 262, or 16%, of them there is a marked condition of under- or mal-nutrition, 10% or more below the average weight. This latter group has been classified according to age and grade, the percentage or proportion to the whole grade calculated, and curves plotted on these percentages, separately for boys and girls (Chart 1). According to this chart, 17% of the girls and 24% of the boys enter the kindergarten to begin their school career handicapped by a considerable degree of mal-nutrition, at least 10% in weight below their average mates of the same age and height. From the kindergarten to the eighth grade, 10% to 20% of the children continue in this same group. The curves of boys and girls run fairly parallel up to the eighth grade. In this grade, at an average age of 14.1 years, the pupils enter the high school, and we note a sharp divergence in the curves of boys and girls: a marked drop in that of the boys; a considerable rise, to 30%, in that of the girls. The total number of both boys and girls examined, however, is

* The standard of comparison is the Height and Weight Table for Boys and Girls, issued by the Child Health Organization of New York.

small; furthermore, there has not been opportunity to inquire into causes; personal, social, or economic; consequently, no conclusions are justified. The figures are given merely as a matter of record.

The whole group of severely under-nourished children throughout the school system should receive intensive study, and plans for such study are now being formulated.

Dr. Thomas D. Hood of Columbia University informs me (personal communication) that the percentage of mal-nutrition given above do not differ much "from those which are found in other communities of good social standing." Such words from such an authority indicate a rather widespread state of mal-nutrition among our American school children, 22,000,000 in number. It requires but little effort of the imagination to see the connection between such percentages at these tender ages and those of the draft rejections. What are we going to do about it?

PREVENTIVE MEDICINE AND HYGIENE IN RELATION TO COLLEGES.

BY ROGER I. LEE, M.D., CAMBRIDGE, MASS.,

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THE student population of a college or university represents a somewhat unique problem in regard to preventive medicine and hygiene. This population has somewhat unusual features. The students live largely in college dormitories. They eat in special boarding places. In their ordinary activities of work and recreation they are associated almost exclusively with fellow students. There are, to be sure, contacts with the outside world, but speaking largely, these contacts are occasional. We can regard the problem of preventive medicine and hygiene in colleges and universities as the problem of a very specialized community and, furthermore, of a community with a specialized industry. Looked at from that point of view the college community will have its own community problems and its own industrial problems. Probably all colleges and universities will present variations so they cannot be accurately contrasted with each other, although a comparison between colleges or between a college and another community or another industry will furnish data of considerable interest.