STUDENT HEALTH CONDITIONS: A MIRROR OF CHILDHOOD ENVIRONMENT AND MEDICAL CARE

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(Introduced by B. K. Richardson)

Of one hundred pupils entering the first grade, seven will matriculate in college and only two graduate from college. In view of this fact, any opinions concerning childhood environment and the medical care of pre-school, school, and adolescent children based upon the findings in the medical records of freshmen, rest upon the exceptional seven rather than upon the average ninety-three who never seek the advantages of an institution of higher learning.

High-school graduates who arrive at college are on the average from eighteen to nineteen years of age, have weathered twelve years in the elementary and secondary schools, and have passed through the greater part of the stress incidental to adolescence. They have undergone tests which not only magnify flaws of heredity, environment, and education, but have been potent factors of selection. They have also demonstrated a certain capacity to meet the demands of a complex civilization.

They are forms which have set in the same moulds for eighteen years and rarely possess extraordinary possibilities of modification. Habit, physique, mental pattern, and character—the resultants of inheritance, surroundings, and training—are much nearer fixation when the high-school graduate applies for admission to college than is generally supposed. He is more a finished product to be polished than raw material with great potentialities of creation. Any observations, therefore, which may be made concerning registrants physically or mentally not only reflect their past but to a large degree suggest their future.

The health status of students at registration is a five-fold index of childhood environment, medical care, and community intelligence: (1) it is a reflector of health knowledge; (2) it is an indicator of the ability of the public to use the well-established methods of disease prevention; (3) their medical records are testimonials of the illnesses, injuries, and trends of the localities from which they come; (4) their mental attitudes are a revelation of their heredity and training at home and at school;

and (5) the presence of neglected defects and uncorrected subnormalities is evidence of the lack of knowledge of parents, and of the lost opportunities of dentistry and medicine.

Health Education.

The usefulness of knowledge and its claim of priority in application are dependent upon power to preserve the individual, to influence his development, to promote his efficiency, to protect him against fraud, and to create the social fruitfulness which is inseparable from progress.

If we accept the dictum, "The proper study of mankind is man," and that the great natural resources are human, it is axiomatic that education which gives tertiary significance to primary considerations, or which inadequately utilizes those concepts and techniques essential for most effective living, fails to meet its obligations either to the individual or to the state.

Several years ago an investigation in four states by a teacher of biology in one of the high schools of Illinois revealed that 59 per cent of the high-school pupils did not know the mosquito was the only transmitter of malaria, 18 per cent believed in the specificity of the mad-stone in the prevention of rabies, 22 per cent that a horse hair in water would become a snake, etc. To determine the content of a course in hygiene for freshmen, a questionnaire as to the amount of physiology studied in high school showed only 24.6 per cent had taken this subject as a regular semester course.

In certain high schools, English, mathematics, civics, and United States history are prescribed subjects. Some science is required, but physics, chemistry, or both may fulfill the requirement. Students are compelled to know dates, how to ascertain the value of x, how to avoid splitting the infinitive, and the age eligibility of senators; but whether they learn the laws of heredity, the structure and function of their bodies, and the conditions best suited to their existence, is left to the happy choice of adolescent inexperience.

The health knowledge of high-school graduates indicates how active a leaven the local health organization has been in the body politic, is a commentary upon the utility of secondary education and the ability of school administrators to distinguish between decorative and fundamental information. It measures the rate at which the public derives benefit from scientific research purchased by taxation and philanthropy. It points to the type of moral and financial support which health administration will receive in their home communities in its attempt to render service commensurate with scientific knowledge and public need.

According to Vincent, public-health authorities can prevent wholly or in part not more than 20 per cent of the diseases causing death and disablement. If his estimate approximates accuracy, the need of the education of the public in the principles of hygiene is both urgent and imperative, if people are not to "perish for want of knowledge." Nothing stands out more prominently than the disparity between what science can do to promote human betterment and what the public uses to enrich life. Research merely gratifies intellectual curiosity, wastes time, and squanders wealth unless ultimately its application leads to progress. Biologically speaking, the more complex a civilization, the more its artificiality and the greater its demands upon man for adjustment. Although more attention is being paid to the physical and social development of children, the number of the criminal, insane, delinquent, dependent, and mal-adjusted cause even the incorrigibly optimistic to look anxiously to the home, the school, and the church.

If national stability and racial vigor are founded upon knowledge and its use, modern education has the tremendous problem of making performance commensurate with possibility in the promotion of personal and social welfare. It also has the more difficult task of making its rate of constructive accomplishment so exceed that of deterioration that the number registered in institutions of higher learning will steadily increase over those detained in alms-houses, asylums, jails, and penitentiaries. At present, the slight numerical difference between public charges and candidates for academic degrees makes one wonder if the present status of society is not proof of social somnolence and if it is not an indictment of education's appreciation of relative values.

Hints from Medical Histories

The medical record of a student is an index of the health administration in his community, of the progress medicine has made in his neighborhood, of the modernness of the school system in which he has been trained, of his hereditary tendencies, and of the alertness of his parents in preserving his health. It reveals the nature of his environment and the social and economic trends of his age.

Nervous Instability

Of the parents of the members of the Class of 1932 in the University of Illinois, 7.5 per cent of the fathers and 9 per cent of the mothers had suffered what is connoted by the inclusive term, "nervous breakdown." Of this group, a total of 49 students themselves gave a history

of having similar ailment before coming to college. During the year 1928-29, 68 students were seen for the indefinite ailment, "nervousness."

This condition is usually indicative of neuropathic heredity, too strenuous life, or both. Not infrequently it is the result of the too early resumption of work after illness, improper methods of study, cumulative fatigue, unwarranted fear, or worry; rarely is it a true psychosis. Nervous instability is more common in women than men. It is due to more strain upon women from routine, from social demands, and from differences inherent in their nervous and endocrine systems.

The student with a normal heredity from a happy home enters college with few complexes and fewer unwholesome repressions. He makes his own adjustments without difficulty, keeps up with his class, gets along with his instructors, and usually plays his part in college with a fair degree of success.

The problem student is generally home-made. Upon parents rest the greater part of the burden of making surroundings wholesome and training effective in developing well-rounded, socially useful lives. The mental atmosphere of the pre-school child is their creation. Habits are fixed most deeply in the mind in the plastic first five years of life. If the normal desires of the child for self-expression and self-satisfaction are reasonably gratified he develops facility in adjustment and cooperation. If they are suppressed, he acquires an inclination toward resistance and contrariness which may handicap him for life.

In the home, the child may get tendencies to extreme dependence and behavior which destroy initiative and hamper him if not render him unable to make a courageous, aggressive attack upon his surroundings. Stanley Hall had in mind the evil fruit of parental indulgence when he declared, "Being an only child is a disease within itself."

Divided, unhappy homes, and divorced parents are often responsible for the maladjustment of the problem student. Faulty conflicts originate in the association with a neurotic mother, a despotic father, or both. Undisciplined adults are a burden to themselves and a calamity to the child who lives with them. Unless mental hygiene includes parents and teachers, it vainly mops the floor without turning off the spigot.

Injuries and Accidents

The great gain in the reduction of illness and death from communicable disease is being lost through the rapid increase in disability and fatality from accidents. Injury is the chief cause of mortality in children between the ages of 5 and 15 years, 21.4 per cent of the deaths between these being due to accidents. Accidents cause more deaths of school

children than diphtheria, measles, scarlet fever, typhoid, and appendicitis combined.

Between the ages of 5 and 15 years, 58.1 boys and 24.5 girls per 100,000 are killed annually by accidents, the rate for motor vehicles alone being 22.3 for boys and 9.1 for girls. The other outstanding causes at this age are burns, drowning, fire-arms, and falls. Before matriculation in the university, 30 per cent of the men and 16 per cent of the women have suffered one or more painful injuries.

The accident rate for female graduates of high schools is on the increase. As girls participate more and more in the games, occupations, and avocations of boys, their liability to injury rises. The risk in driving and being hit by an automobile shows no sex discrimination. What does it profit a people to save their children from death by vaccination, antitoxin, sanitation, and quarantine, only to have them killed by accident?

Of the students entering college, on an average, 40 per cent have undergone operations. Of the entire student body, 32 per cent have had operations upon the head (in the main, tonsillectomy and adenoidectomy), and 7 per cent have been in need of abdominal surgery, usually for appendicitis. The high incidence of the removal of tonsils and adenoids is an indication of how parents will have radical treatment used for their children once they appreciate its need.

Tuberculosis

Tuberculosis is the most common disease in the family history of our students; one in fourteen has either a father or mother who has it or has had it. Where this disease has existed in parents, one in every twenty-five of the men has had tuberculosis of the bones, joints or lungs. Where it exists in the home, the risk to the daughters of the family seems to be several times that to the sons. This observation must be taken with reservation because it is based upon only 3,000 students. It does, however, indicate that even slight differences in the closeness of contact and the more sedentary life of girls than boys are reflected in the morbidity rates. These findings are not inconsistent with the mortality rates for the state. Although during the last decade the death rates have been higher for males than females, the decrease has been greater among the former than the latter. Tuberculosis is on the increase in girls in the 'teen age. In Illinois, the mortality rate of girls from 15 to 19 years is 64 per cent higher than that of boys of the same age.

This increase is also due to starving, style, and speed—which decrease bodily resistance. Warned against stoutness by advertisements, inspired to become a sylph by paragraph and picture, and urged to reach

for a cigarette instead of a sweet, some girls take too little food for growth, tissue repair, activity, and warmth. Their insufficient clothing lowers bodily temperature, too much social activity saps vitality, and an obsession to be petite makes conditions favorable for the bacilli to multiply; tuberculosis develops and a once-healthy girl starts for the sanatorium. Disease is the bonus received when vigor and strength are exchanged for fads, fashion, and frolic.

Communicable Disease

The incidence of communicable disease in students before registration shows the usual high rates for chickenpox, measles, mumps, and whooping cough. A greater percentage of the women than men have had diphtheria, measles, pneumonia, scarlet fever, and whooping cough. Mumps, smallpox, and typhoid fever have been slightly more common in men. For the five-year period under consideration, 4.3 per cent of the men and 5.1 per cent of the women had rheumatic fever, approximately a 25 per cent increase of the latter over the former. For the same time, 17 per cent of the women had had tonsillitis, but only 7 per cent of the men.

It is not clear whether this higher occurrence of communicable disease and greater prevalence of sequelae in women are due to the less resistance of the female than the male, or to the fact that girls are likely to receive more exposure to disease when it occurs in the home than boys. Whatever the cause of their greater susceptibility, it means more infections of the middle ear and more organic heart disease in women than men.

Acquired heart disease in high-school graduates usually has its origin in rheumatic fever, chorea, tonsillitis, scarlet fever, and diphtheria; rarely in athletics *per se*. Occasionally, a heart is damaged by too strenuous activity, but generally the injury is associated with too early resumption of training in convalescence from infection.

The stellar role in juvenile heart disease is played by rheumatic fever, ably supported by chorea and tonsillitis. Children with dental caries and those subject to repeated attacks of tonsillitis seem predisposed to arthritis. Adenoids, diseased tonsils, and decayed teeth should receive prompt attention to prevent them from becoming portals of entry for bacteria causing damage to the heart. Parents should know that "growing pains" are usually rheumatic fever in disguise and that children with such symptoms require constant medical supervision to give their hearts maximum protection.

With the exception of scarlet fever and diphtheria, high-school graduates from the country, whether men or women, have had 12.1 per cent more communicable disease than those from the city. Those from the city have had about 5 per cent more diphtheria and scarlet fever. How much of this difference represents greater susceptibility of one group than the other, how much better control of communicable diseases, and how much more efficient health administration, is conjectural.

In the rural sections where opportunity for contact is less than in the city, the rates for the "dreaded diseases," diphtheria and scarlet fever, are lower; those for supposedly "harmless," chickenpox, measles, and mumps, are higher. When they come to college, students from the country are more susceptible to both of these diseases than their classmates who live in town. The explanation of this difference may lie in the greater precaution taken in rural homes against the spread of infections for which there is a wholesome fear.

The Use of Well-Established Methods of Prevention

Diphtheria, smallpox, and typhoid fever are diseases whose means of prevention have obtained such a degree of efficiency that their presence is proof of lack of information, prejudice, or procrastination of parents, the want of initiative and alertness of the family physician, and a social myopia which renders a community blind to economic loss, disease, and death unaccompanied by flaming head-lines in the newspaper or a catastrophe.

On matriculation, 8.1 per cent of the men and 9.6 per cent of the women have had diphtheria, which a Schick test and toxin-antitoxin would have prevented. These men and women have been needlessly subjected to a disease which has a predilection for the heart and is a factor in the high mortality rate of cardiac disease. Lest it be assumed diphtheria is near extinction, it should be noted that for the year 1930 a total of 2,911 cases had been recorded by the State Department of Health up to April 28.

Smallpox showed an incidence of 4 per cent in the medical histories of the men and 3 per cent in those of the women. Of the former, 26 per cent and of the latter 54 per cent were unvaccinated on registration. There should, therefore, be no surprise that 2,318 cases should occur in Illinois during the first seventeen weeks of 1930 nor that since the World War smallpox has cost Illinois enough money to build an eighteen-foot hard road from Danville to Quincy.

Only 16 per cent of the men and 5 per cent of the women, all in the ages in which the individual is most susceptible to typhoid fever, had been immunized against it. Of both groups, 4 per cent had had the disease and undergone the immediate and subsequent hazards associated with a serious illness of 4 to 6 weeks.

The extent of the employment of tried methods of immunization is a test of the knowledge and character of the individual, the effectiveness of health administration, the initiative of the medical profession, and the ability of a democracy to use the results of the research for which it pays.

Physical Examination

The relative general development of men and women shows little variation. The former tend to be average; the latter, to extremes of thinness or stoutness. These trends are also found in children from nine to sixteen years of age and are apparently normal. About 3 per cent of the students have excellent development and approximately 5 per cent are classified as having poor physiques.

Only 41 per cent of the men and 60 per cent of the women had all their teeth, had no cavities, their gums were normal, and their teeth did not need cleaning. Of the women, 25 per cent and of the men 5 per cent had some enlargement of the thyroid. Of these men, 73 per cent had a slightly enlarged thyroid, 25 per cent moderate and 2 per cent marked hypertrophy. Of these women, 48 per cent showed slight simple goitre, 46 per cent moderate and 6 per cent marked. This struma was almost entirely due to adolescence and locality. This type is amendable to time and iodine. Organic heart disease was present in 3 per cent of the men and in 5 per cent of the women.

Hernia is relatively rare in women, but one man in twenty-eight was found to have this abnormality. As this condition is curable by surgery, its presence indicates the failure of parents to appreciate its nature and its incurability in adults without operation. It may also point to failure of the family physician to advise radical treatment.

Albuminuria is present in about 5 per cent of the students examined; about one-half of it is orthostatic and one-half persistent. The latter form is commonly associated with diseased tonsils, discharging ears, root abscesses or other focal infection, the removal of which often causes the condition to disappear. It also may indicate a kidney damaged by scarlet fever or other communicable disease.

Of the men 35 per cent and of the women 42 per cent have had their tonsils removed; in 11 per cent of the former and 17 per cent of

the latter, they were diseased. Only 46 per cent of the men and 71 per cent of the women have normal eyes by the Snellen chart; 8 per cent of the men and 11 per cent of the women wear glasses. About 5 per cent of both men and women have structural curvature of the spine and a similar number, third degree flat foot.

Physique is the product of heredity, nutrition, activity, health and environment. The individual can do nothing about his inheritance but the other factors are subject to modification by his parents and himself. When the skeleton, teeth, musculature, weight and posture show the marks of an unbalanced diet, uncorrected defects, lack of exercise and poor surroundings, the evidence is conclusive, medicine, economics, and education have failed in their duty to society.

Never was an Elijah so needed to proclaim from a Mt. Carmel that bodily defects and unwholesome mental attitudes must be corrected in the first decade of life if corrections are to be more than compensation, substitution or an attempt at the impossible. Eyes which have passed through the turn-stile of astigmatism to myopia may be refracted but not cured. Hearing lost through otitis media is seldom found. Bridges may take the place of molars, but facial asymmetry persists. Corrective exercise may be invoked but a structural scoliosis and a rigid flat foot remain. The heart inadequately safe-guarded when the child had chorea, diphtheria, rheumatic fever or tonsillitis may be protected, but never restored. Kidneys and blood vessels damaged by communicable disease far too often end prematurely the careers of promising individuals at the height of their usefulness.

Bodily defects must be corrected in their incipiency when childhood provides the plasticity and the recuperative power to make success possible. Thought, action and habit must be given direction at a tender age before reaction, mental attitude and character are fixed in unwholesome or antisocial patterns.

Truly, speaks the proverb old,
With a meaning vast,
"The mill cannot grind
With the water that is past."