

DEPARTMENT OF THE INTERIOR
BUREAU OF EDUCATION

BULLETIN, 1919, No. 48

EDUCATIONAL HYGIENE

By

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[Advance sheets from Biennial Survey of Education
in the United States, 1916-1918]



WASHINGTON
GOVERNMENT PRINTING OFFICE
1919

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5 CENTS PER COPY

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By WILLARD S. SMALL.

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CONTENTS.—Physical education in the preparation of teachers.—Malnutrition and the nutrition class.—Health supervision.—Closing school as a measure for controlling epidemics.—Eye hygiene.—Oral hygiene.—State legislation for physical education.—The Nation's need of physical education.—Physical education and military training.

PHYSICAL EDUCATION IN THE PREPARATION OF TEACHERS.

Effective physical education of the children of the elementary schools will always be conditioned largely upon the regular classroom teachers. Obviously physical education must have a large place in the preparation of teachers if they are to play well their part in the conservation of the physical resources of childhood. It must be recognized that this part of the preparation of teachers is fundamental and vital, not an accessory to the formularies of mental training and discipline.

There are about 250 normal schools in the country—State, county, and city schools. Returns from 145 of these to an inquiry by the Bureau of Education show the following facts as to extent and character of physical education:

1. Number requiring health certificate at entrance.....	44
2. Number requiring medical examination.....	68
3. Number requiring health certificate for graduation.....	24
4. Number requiring physical exercise of all students.....	124
Gymnastics.....	100
Dancing.....	55
Athletics.....	47
Games.....	102
5. Number requiring practice teaching:	
(a) In callisthenics.....	74
(b) In gymnastics.....	68
(c) In dancing.....	63
(d) In athletics.....	40
(e) In games.....	91
6. Number having special teachers of physical training:	
(a) Male.....	53
(b) Female.....	111
7. Number having gymnasiums.....	110
8. Number having swimming-pools.....	28

The first striking fact is the relative neglect of physical standards for teachers. Less than one-third require a health certificate for entrance; less than one-half require a medical (or physical) examination at any time; just one-sixth require a health certificate for graduation. It may be noted in passing that the health certificate required is rather a certificate of freedom from disease than a certificate of vigorous health.

Two important omissions will be noted: The time devoted to physical education and the kind of instruction in health habits and health knowledge.

The encouraging things in this report are the number requiring physical exercise of all students, the emphasis upon games, both in required exercise and in practice teaching, and the number having gymnasiums. There is a distinct gain in these respects in the last 10 years.

From these returns and from other inquiries, studies, and observations two important generalizations may be made:

1. In a few normal schools a broad and true conception of physical education prevails. It is recognized as organic and general, not as specialized psychomotor training. It sees that its job is to know how children grow into health and to control the conditions and practices that are favorable or unfavorable to such growth. And it sees, further, that the way to make such principles effective in the schools is to make them effective in the preparation of teachers.

Certainly the following elements enter into such a program: Physico-medical examination at entrance and annually, at least, during the course; health certificate for graduation; daily physical exercise, at least one hour, of an enlivening and joy-producing kind; practice teaching of such exercise for children; playgrounds and gymnasiums necessary for such exercise; practical study of hygiene as exemplified in school life and environment; instruction in normal physical diagnosis.

2. The second conclusion is that complete fulfillment of these conditions in normal schools is rare. A few schools meet all the conditions with a considerable degree of thoroughness; more meet some of the conditions well and are short on the rest or meet them inadequately; and others meet all these conditions inadequately or not at all.

There is, however, light upon the horizon. Most of the newly enacted laws interpret physical education in the broad sense indicated above. Some of these, tho compulsory in form, are hardly more than permissive in substance, but they all point to a new emphasis on physical education in the normal schools. Several of them specifically include the normal schools in the application of the law. In other States, some normal schools without the stimulus of

law are doing excellent work. In many instances readjustment of programs and ideals will be necessary. Three things will be required: (1) Time, (2) careful planning of the course in physical education, and (3) broadly prepared teachers.

A minimum of one hour a day of enlivening and joy-producing exercise has already been suggested. This serves a double purpose; to conserve and develop the health of the students and to produce the raw material of personal experience without which it is hopeless to undertake to train teachers to teach.

Complementary to this at least one hour (period) per day should be given to instruction in the principles and practice of physical education. Not to enter deeply into details, under "principles" must be included the basic sciences anatomy, physiology, and hygiene—general, individual, and group; and the values of physical education—educational, social, civic, and economic.

Under "practice," must be included certainly practice in hygienic inspection of school plant; in cooperation with medical inspectors and nurses; in conduct of posture examinations and tests; in direction of drills, gymnastics, and games, community recreation projects; and in teaching habits and ideals of health.

VOLUNTARY ORGANIZATIONS.

The war has given stimulus to many voluntary organizations seeking to improve the health of school children. It may not be invidious to mention especially the Child Health Organization. This is an outgrowth of a committee of the New York Academy of Medicine on "War-time problems of childhood," formed primarily to study the problem of malnutrition among school children. "The revelation of the extent to which malnutrition had been shown to exist among school children of New York and its steady increase, due to ignorance of food values and the rising cost of food, was brought to the attention of Secretary Lane, of the Department of the Interior, who urged the formation of a national committee composed of lay and medical members to study the problem and advise means for its solution. In order to avoid the creation of an entirely new association, an organization to promote the health of school children was perfected as one of the branches of the National Child Labor Committee, which has always been interested in health education."

The following is a program that the Child Health Organization has set itself:

1. To teach health habits to children and to secure adequate health examinations for all children in the public schools of the country, including—

- (a) Stimulation of children's interest by placing weighing and measuring scales in every school and acquainting children with ways and means of reaching the normal weight and height.

(b) Determination of proper standards for examinations with special reference to normal nutrition and growth.

(c) Methods of examination; how extensive for general application.

(d) Health records, which should cover the entire school life of the child and, with scholarship record, accompany him in his progress through school, and in making his application for a work permit.

(e) The arousing of a public demand for health examinations, the teaching of health habits, and the keeping of health records as a part of the regular routine of school life.

2. To consider the urgent problem of malnutrition among school children.

(a) A more careful study than has yet been made to determine its extent and degree, both in urban and rural communities.

(b) A study of the measures proposed to combat this condition, such as, (1) special nutrition classes; (2) making it possible for children to get one or more hot meals at school; (3) instruction of the community in the proper feeding of children of school age.

(c) To furnish information to educational and philanthropic organizations regarding the practical application of the results of these studies.

3. To safeguard the health of children in industry; this involves:

(a) The requirement of physical fitness for each particular job.

(b) The periodical examination of children who remain at work in factories, stores, and other establishments.

(c) The cancellation of permits to work at jobs not suited to the children from the health viewpoint.

4. Propaganda to awaken the public to the necessity of conserving the health of the school child as a basis of national security and stability.

5. To promote or cooperate with other bodies in securing legislation for the attainment of these objects.

The Bureau of Education, through its Division of School Hygiene and Physical Education, in collaboration with the Child Health Organization, is issuing health education material based upon the principle that normal increase in weight is the best rough and ready health index, and that by frequently recording the weights of children in a classroom the interest of children in health habits will be stimulated and sustained. The material consists of classroom weight records and a series of simple health education pamphlets.

Another notable contribution to the devices for teaching health is the Health Crusader plan of the National Tuberculosis Association.

MALNUTRITION AND THE NUTRITION CLASS.

To combat malnutrition by instruction and the formation of health habits is the object of the "nutrition class." An experimental nutrition class was conducted under the auspices of the Bureau of Educational Experiments in Public School No. 64, New York, in 1918. The class was conducted under the direction of Dr. W. R. P. Emerson, of Boston.

In Public School No. 64, Manhattan, where the experiments were conducted, 804 children were weighed and measured. The heights and weights were compared with standard measurements, so that the ratio of actual weight to average weight for height could be determined for each child. This average weight for children who measure 53 inches is 69 pounds. A child of this height who weighs only 62 pounds is 7 pounds, or 10 per cent, less than the average. The accompanying table shows the percentage of children in four different grades who were—(1) 7 per cent or more under the average weight for their height, (2) within 7 per cent of average weight, and (3) more than 7 per cent over the average weight for their height.

Percentage of overweight and underweight children.

		Grade VII.	Grade VI.	Grade V.	Grade I.	Total.
Children 7 per cent or more overweight...	Number...	38	40	21	27	126
	Per cent...	22.0	16.3	16.5	10.6	15.8
From 7 per cent overweight to 7 per cent underweight.....	Number...	110	168	79	185	540
	Per cent...	63.6	67.8	62.2	72.5	67.4
Children 7 per cent or more underweight.....	Number...	25	39	27	43	134
	Per cent...	14.4	15.9	21.3	16.9	16.8
Total.....	Number...	173	245	127	255	800
	Per cent...	100.0	100.0	100.0	100.0	100.0

Different conditions were provided for these four classes, and an attempt has been made to determine to what extent various methods of procedure were successful. These conditions may be grouped under the following general captions:

I. Instruction in health habits.—A child should be taught proper habits of eating; sufficient mastication, the elimination of water as a flush, regular meals at a time of minimum fatigue, stimulants such as tea and coffee not to be used. These are some of the things toward which a child's attention should be directed.

II. Removal of physical defects.—Adenoids, enlarged tonsils, and defective teeth are contributing factors in undernourishment. They supply toxins which interfere with digestion, and the adenoids and tonsils prevent the taking in of sufficient oxygen.

III. Rest and lunches.—Undernourished children are unable to store up sufficient energy during the ordinary night's rest or through the usual number of meals. A rest period once or twice during the day provides an opportunity for recuperation, and food taken at more frequent intervals is more beneficial than the same amount consumed in the usual three meals.

IV. Direct feeding.—It has been assumed in many instances that the reason for undernourishment or malnutrition is inability to procure the necessary food.

If this is the condition, food should be supplied. One group of children was given only a midday meal, which was supposed to meet all the demands in the way of quantity and quality of food. Another group was given only instruction in health habits, with recommendations for rest and food and the removal of physical defects. Another group was given the instruction in health habits and provision was made for rest periods and mid-morning lunches, with recommendations for the removal of physical defects. Still another group was given all of the provisions so far mentioned. Comparison of results in these different groups shows that the poorest progress is made where nothing is provided except a sufficient quantity of food. The greatest progress was made by the children who were instructed in health habits, and who were simply advised to have frequent intervals of rest and more frequent meals.

The physical defect which seems to have the greatest effect on the nutritive processes, judged by the New York experiment, is that of the naso-pharyngeal obstruction. Out of the 105 children included in the classes, 69 suffered from this breathing obstruction. Two out of every three undernourished children had difficulty in getting sufficient oxygen. Comparisons of the progress made by those who did not need an operation, by those who needed and did not have an operation, and by those who needed and had an operation performed, show a serious handicap is imposed on children when the obstruction is allowed to remain.¹

SEX EDUCATION.

The war has lifted the veil of false modesty from the question of social hygiene and sex education. Effective methods of instruction in the cantonments have been developed. The Commission on Training Camp Activities through its camp community service has done much to educate the public. The State health departments and the United States Public Health Service have carried on effective educational propaganda. Religious and educational societies as well as medical societies are seriously grappling with the great problems of sex education. The bureau, in cooperation with the medical section of the Council of National Defense, has issued a pamphlet, "Keeping Fit," for high-school boys, giving simply and briefly the main factors in physical fitness, including sex. The appreciation of this pamphlet has been instantaneous and sincere. Requests have come for large numbers of copies not only from high schools but also from the Young Men's Christian Association, Boy Scouts, industrial firms, and many other sources.

The Public Health Service and the Bureau of Education in cooperation are planning a thorough investigation of practicable methods of sex education in the high school.

The Interdepartmental Social Hygiene Board, created by Congress in the summer of 1918, is authorized to pay the sum of \$300,000—

to such universities, colleges, or other suitable institutions or organizations as in the judgment of the Interdepartmental Social Hygiene Board are qualified

¹ Report furnished by Dr. David Mitchell, Bureau of Educational Experiments, 16 West Eighth Street, New York.

for scientific research for the purpose of discovering and developing in accordance with the rules and regulations prescribed by the Interdepartmental Social Hygiene Board more effective educational measures in the prevention of venereal diseases and for the purpose of sociological and psychological research related thereto.

MEDICAL SUPERVISION.

In all foreign countries the medical supervision of schools has suffered during the war. School medical officers, like all other members of the medical profession, have been called to military service. In our own country the same condition prevails, though to a less degree. For example, the consolidation of all health supervision and physical education activities under the school authority was successfully inaugurated in Holyoke, Mass., in 1915-16. In 1917 the efficient director of the work went elsewhere, and under war conditions no competent successor could be found.¹ In few States or communities, however, has there been any improvement in the work of school medical supervision. North Carolina appears to be one exception. The revised law which went into effect at the beginning of the present school year requires that teachers shall make a preliminary examination of all pupils, and provides for detailed examination of all suspected children by the county medical officer or by a physician designated by the State health department. The report of the first year's work under the new law shows that "more than 3,000 teachers properly filled out the cards after careful preliminary examination of more than 150,000 children"; and that of this "number of children, 34,387, or nearly one-fourth, have been carefully examined by the school physician or a specially trained school nurse." The report further shows much successful follow-up work and the establishment of dental clinics. "The most gratifying feature of the year's work has been the uniformly satisfactory work of the teachers in completing the preliminary examination of the children."

CLOSING SCHOOLS AS A MEANS OF CONTROLLING EPIDEMICS.

The following resolution was adopted by the American Health Association at its annual meeting in October, 1917:

Resolved, That it is the sense of the American Public Health Association that the Federal Bureau of Education should attempt to discover what is proper practice as to continuing or closing the schools as a means of controlling epidemics of measles, whooping cough, scarlet fever, diphtheria, smallpox, and poliomyelitis, and that they should publish their conclusions in the annual report of the Bureau and in bulletin form.

¹ See reports of superintendent of schools, Holyoke, Mass., for the years 1915, 1916, and 1917.

This service was accepted by the Bureau of Education upon the condition that a committee of the association be appointed to cooperate with the Bureau in carrying out the purposes of the resolution.¹

The following is a summary of the preliminary report of the committee:

Scope of inquiry.—The committee decided to limit the inquiry to the following three lines: (1) Summary of State laws bearing upon the question; (2) review of literature on the subject; (3) inquiry to be sent to 50 selected cities covering regulations, rules of practice, and results.

1. *State laws.*—An incomplete survey of State laws shows very few specific statutory references to the matter; rather general authority to control is vested in an administrative body.

2. *Review of literature.*—Review of more than 150 papers published during the past 20 years in journals, in official reports, and as chapters of books shows progressive abandonment of faith in, and the practice of school closure as a measure of controlling epidemics affecting school children. Yet even in recent literature there are still some expressions of opinion in favor of closure under special conditions. Analysis of these special conditions shows that they are of three types:

(1) Etiology of the disease unknown, e. g., in epidemics of infantile paralysis, epidemic meningitis, and possibly a few other diseases, it may occasionally still be necessary to resort to closure of schools.

(2) Severity of an epidemic that defies all efforts at control.

(3) Inadequate medical supervision of schools.

With these qualifications, the consensus of judgment in the literature reviewed may be summarized as follows:

The closure of schools is an extremely clumsy, unscientific, and unsatisfactory method of controlling epidemics among school children. It results not only in loss of school time and money, but it fails to control, inasmuch as infected children are at large, playing in the street, without restriction, and therefore spreading the infection.

The modern method, consisting of careful daily inspection of infected schools, isolation of sick children, and quarantine of contacts is both more effective and more economical.

Closing of schools should be considered as a last resort, to be used only when thorough and systematic application of other measures fails to effect control.

¹ The committee consisted of Dr. W. C. Woodward, health officer, Boston; Dr. F. G. Curtis, health officer, Newton, Mass.; Dr. Bernard Kahn, acting director of medical inspection of public schools, Philadelphia; Dr. T. Clark, U. S. Public Health Service; Dr. W. B. Small, Bureau of Education, chairman.

It is also recognized that in sparsely populated rural areas, where aggregation takes place only in the schools, closure may be necessary. It is further recognized, however, that this condition would yield to adequate inspection.

3. *Inquiry in selected cities.*—An inquiry consisting of 14 questions was sent to 50 cities in 31 States. Replies were received from 32 cities in 19 States. The questions covered the following items: Laws or regulations providing for closure of schools in event of epidemic; extent to which closure is practiced; regulations governing exclusion of cases and contacts; frequency of inspection for discovering cases and supervision of contacts; home visitation for discovery of cases; extent and methods of disinfection; extent to which culture tubes are employed for detection of diphtheria carriers in schools and the Shick test for determination of immunes; laws and regulations governing vaccination; results of measures of control and methods of securing cooperation between school medical inspection service and local health authorities.

Minute examination of the returns, many of which were very full and explicit, confirms conclusions reported above from review of literature.

Successful control of contagious diseases in and through the schools is quite definitely correlated with the following conditions: Absence of closure; careful provisions for exclusion of cases and contacts, emphasis being placed upon clinical data rather than upon fixed period of exclusions; careful daily or frequent periodical inspection of schools; systematic home visitation; reliance upon natural and physical cleansing rather than upon chemical disinfection.

Without exception the cities that report reliance upon these measures report that they have had no occasion to close schools since such measures were adopted. On the other hand, the cities reporting inadequate measures of inspection also report reliance upon closure and disinfection by chemicals. The two following cases are typical. The cities are nearly the same size.

CITY A.

1. Regulations require closure for all the diseases specified except whooping cough.
2. Rigid period of exclusion of cases.
3. Rigid period of exclusion of contacts.
4. As much daily inspection as can be given by four physicians and one nurse for 40,000 children.
5. Home visitation; "check every rumor as far as possible."
6. Disinfection is practiced by formalin fumigation and washing walls with strong solution.

7. No definite reply in regard to results except that closure was resorted to twice last year, and that by utilization of teachers and principals there has been a reduction of the preceding year's record of active cases.

CITY B.

1. No law, but power has never been questioned.
2. All contagious cases are excluded until personally examined by epidemiologist.
3. Contacts are excluded at the discretion of the epidemiologist.
4. Nurses inspect daily; doctors on call.
5. Nurses investigate all suspicious cases.
6. Do not practice disinfection.
7. Methods of control seem to be satisfactory. In the four years since adopted, no occasion to close schools and very few recurrent cases.

CONCLUSIONS.

1. Closure of schools as a means of controlling epidemics of the six diseases specified is unnecessary, unscientific, and unjustifiable.

2. Disinfection by fumigation is unnecessary and ineffective. The use of chemical solutions is generally unnecessary. Disinfection by air and sun and cleansing with hot water, soap, and scrubbing is to be commended.

3. The proper method of control involves sufficient inspectorial force of physicians and nurses to maintain close supervision of cases and contacts; enforcement of isolation and quarantine under elastic administrative regulations; the employment of clinical and laboratory tests and reliance upon such data; close correlation of the school medical inspection, on the one hand, with the health department, and, on the other hand, with the school forces; and continuous education of the public.

4. The wide diversities in rule and practice revealed by this study should be eliminated or reduced. It is unreasonable, unscientific, and absurd that there should be such variations in the minimum period of exclusion as from 14 to 42 days (scarlet fever). This is nearly typical of many variations that could and should be eliminated. They do not depend upon adequate or inadequate support of medical inspection; they depend solely upon ignorance, indifference, or unreasonable difference of opinion. Much of this diversity would be eliminated by acceptance by all school health officers of the standards set up in the report of the "Committee on Standard Regulations for Control of Communicable Diseases," submitted to, and adopted at, the 1917 meeting of the Public Health Association. (U. S. Public Health Service: Public Health Reports, October 12, 1917.)

EYE HYGIENE.

The report of the Provost Marshal General on the First Draft under the Selective Service Act stated that "the specific source of defect showing the largest percentage of rejectives was eyes," 21.68 per cent. It is to be remembered that this was prior to the promulgation of the regulations providing for "limited service." The second report of the Provost Marshal General shows that of "Grade D disqualified for any military service," 10.65 per cent were rejected on account of eye defects. The percentage of men relegated to "limited service" on account of eye defects is not given, but obviously it was large. From the point of view of military efficiency, as well as from the point of view of industrial efficiency and of general human welfare the conservation of vision is still "one of the most serious problems of educational hygiene."² The most important contribution to this subject since 1916 is a survey of the causes and extent of defective vision as related to school environment and of effective methods for prevention and correction made in New York in 1916-17, by Mr. J. H. Berkowitz for the Bureau of Child Welfare of the Association for Improving the Condition of the Poor. This study covered the nature and extent of defective vision in school children; the preventable causes of defective vision within the schools and the factors in school life contributing to deterioration of eyesight; conservative and preventive measures; clinical facilities for correction of eye defects and agencies for supplying glasses to needy children; and necessary improvements in facilities and methods in these various fields. Intensive investigations were made in a large number of classrooms of physical conditions and school practices relative to eyesight. The facilities and methods of the municipal and privately owned clinics and dispensaries were carefully investigated. A limited inquiry was made into the follow-up methods.

In final form the report³ of this survey included not only the results of the investigations in the New York schools but also data from about 40 other cities in the United States and from foreign cities, summaries of important earlier investigations, appendices (text of important reports difficult to obtain), and bibliography.

ORAL HYGIENE.

As was to be expected from our knowledge of the condition of teeth of school children, a large amount of dental disease was found among the drafted men. The percentage of rejections for this cause was not large: 8.50 per cent in the first report of the Provost Marshal

¹ Operation of the Selective Service System to December 20, 1918.

² Report of the Commissioner of Education, 1916, ch. 19.

³ This report is soon to be published as a bulletin of the Bureau of Education.

General, 5.69 per cent in second report; but it is stated by Dr. Fones,¹ as result of his work with men stationed at Bridgeport, that "the appalling need for prophylactic work among these soldiers and the interest and willingness of the men to have this treatment can hardly be realized." Thus the need of systematic work for the conservation of the teeth of school children is again emphasized.

This work must be both prophylactic and reparative. In most cases where dental clinics have been established in the schools, the emphasis is upon reparative work for indigent children. As an educational project, however, obviously emphasis should be placed upon prevention and conservation.

PREVENTION EMPHASIZED.

Bridgeport, Conn.—Arguing that it is impracticable to repair the decayed teeth of all the school children and that it is repugnant to American ideas to dispense charity in the public schools, Dr. Alfred C. Fones, of Bridgeport, has sought to "evolve a plan for the prevention of dental decay and the establishment of clean mouths as an active part of our great free educational system."

Following is the substance of the plan as reported by Dr. Fones in the third year of operation:²

We have tried to work out this plan in Bridgeport, and after three years we find that our educational and preventive dental clinic is the most important part of our school and health systems. Under the plan of this clinic every child undergoes an examination of his mouth and receives a prophylactic treatment of his teeth, accepting it as much a part of the school curriculum as his geography lesson. Every child is taught a method of brushing his teeth and is educated in the care of his mouth just as he is taught physiology or callisthenics. In this way the municipality accepts one-half the responsibility of aiding and educating the children in the prevention of dental decay, while the home care of the mouth and proper feeding is assumed by the child and his parent.

The work of the clinic is divided into four distinct parts. First, the actual cleaning, polishing, and examination of the children's teeth in schools. Second, the tooth brush drills and classroom talks. Third, stereopticon lectures for the education of children in the higher grades. Fourth, educational work in the home carried on by special literature to gain the cooperation of the parents. It may be well at this point to make clear to those outside the dental profession what a prophylactic treatment really is. It consists mainly in the thorough cleaning, by means of orange wood sticks in hand polishers, of every surface of every tooth. This means the removal of all stains and accretions on the teeth and especially of the sticky, mucilaginous films known as bacterial plaques, which are the initial stage of all dental decay. The importance of removing these plaques can thus be readily understood. This work of prevention of dental decay is essentially a woman's work, and to the dental hygienist it opens up paths of usefulness and activity in helping humanity in masses.

¹"An Educational and Preventive Dental Clinic." Nat. Dental Assoc., 21st An. Sess., Oct. 23-26, 1917.

²"Mouth Hygiene for U. S. Soldiers, Nat. Dental Assoc., 21st An. Sess., N. Y. City, Oct. 23-26, 1917.

In 1913-14 we trained the first class of dental hygienists in Bridgeport, and two of these women were selected as dental supervisors when our clinic started in the fall of 1914. We had received \$5,000 to carry on a demonstrating preventive clinic for the children of the first two grades of our schools, and our corps consisted of 8 dental hygienists and 2 supervisors. In but one year our city officials were so impressed with the results of our work that the appropriation was doubled, the corps enlarged, and a woman dentist added, and now, the fourth year of our clinic, we have a corps of 20 dental hygienists, 2 supervisors, and 2 women dentists, and an appropriation of \$21,529. The money is appropriated through the board of health and the clinic is conducted by a sub-committee of this board.

Time will not permit giving a detailed report of our clinic from its start in 1914, but it may be said that the system now employed is very similar to that used originally.

The dental supervisors oversee and direct the work of the dental hygienists, give classroom talks, toothbrush drills, stereopticon lectures, attend to the distribution of literature to children and supplies to the hygienists, and arranging for the moving and location of hygienists in each school.

The work of the dental hygienists consists in making the examination and records of the teeth, giving the prophylactic treatments and instructions in the home care of the mouth.

When the equipment is placed the hygienist begins work for the children of the first grade and takes each grade in succession through the fifth. The charts are made of each child's mouth, one for the parent and one which is a permanent record for the files, showing the conditions found in the mouth for a period of five years.

Aside from the actual cleaning of the children's teeth, the work of the supervisors with tooth brush drills is considered very important, and every effort is made to present this phase of mouth hygiene to the children in a way that will be educational and interesting. It has been quite a problem to secure a good brush that can be sold for 5 cents, and up to the present time nothing better has offered than factory seconds of a good make of brush.

On the day preceding a toothbrush drill a notice is sent to the parent requesting that the child be allowed to bring his tooth brush to school, and that it be securely wrapped in clean paper. Announcement is made in the classrooms that any child may purchase a new toothbrush for 5 cents. The drill proper is given with the children seated, while the assistants pass up and down the aisles helping the children to hold the brushes correctly and to make the right movements. There are four positions for holding the brush and two movements in each drill. The children brush to count in a stereotyped form, it being intended to teach merely the correct form of brushing and not meant for the actual cleaning of the teeth which would require running water and dentifrice. A second talk is given up to the care of the brush and the necessity of hanging it in a clean place. The children repeat the drill standing, and the brushes are wrapped in clean waxed paper to be taken home.

It is hardly possible to estimate the educational value of the toothbrush drill in the classroom. It is accepted by the children as part of the curriculum, and therefore something to be learned and remembered. The teachers have aided in many ways to assist the children in forming the habit of daily brushing.

When the children of the first and second grades receive their first treatment, it is frequently found that while many of the deciduous teeth are decayed, the few permanent teeth erupted at that age are sound, with the exception of the six-year molars. The very first small cavities are just appearing in these

teeth, and we believe that the small children entering the prophylactic system should all start on the same basis, that is with sound permanent teeth. We have two women dentists who work with the hygienists in our schools and confine their efforts to the filling of the first permanent molar teeth. We term this preventive dentistry also, as the effort is made to thus prevent the development of large cavities in these, the most important teeth of the denture.

As yet we are not fortunate enough in Bridgeport to have a free dental clinic for the poor, but the work is now progressing rapidly on a welfare building where such a clinic will be conducted. In the meantime the board of health employs a centrally located dentist to relieve toothache for any child in our public schools presenting the relief cards issued by the dental committee through the school principals, but no attempt is made to do any reparative work

REPAIR WORK EMPHASIZED.

The following facts in regard to plans and cost of operation of dental clinics in four cities were gathered by the District of Columbia Dental Society in the autumn of 1917:

Philadelphia.—There are eight free dental clinics for school children, four of which are located in public schools and four in health division centers of the Bureau of Health. The entire staff in the dental dispensary consists of: (a) Chief of dental dispensaries. (b) Thirteen assistants. (c) One attendant.

The cost is \$15,000, divided as follows:

- \$9,100 for salaries of assistants, \$700 per year each.
- 2,500 for salary of chief of dental dispensaries.
- 800 for salary of attendant.
- 2,600 for maintenance and supplies of clinic.

No specific number of children is allotted to a clinic. Each one takes care of as many as possible. During the month of May, 1917, 2,370 visits were made by children to the clinics, an average of nearly 300 per clinic per month. The children are brought to the clinics by school nurses, parents, older children, probation officers, and others. The assistant dentists receive \$300 a year each for three hours of continuous working service per day.

Chicago.—Chicago supports nine full-time and four part-time clinics. The budget for 1917 provides \$11,000 for salaries and \$1,500 for supplies.

Each clinic cares for an average of 10 or 12 children daily. In 1916, the report on dental service showed: New cases, 7,049; treatments given, 30,749; fillings, 28,877; crown and bridge work, 63; extractions, 20,554; visits of dental surgeons to dental clinics, 2,191.

Children are selected for treatment in the dental clinics upon the basis of examination given by school health officers. The parent is advised of defects found. School nurses follow up these cases, and if parent can not afford to pay for a private dentist the nurse arranges to take the child to a dental clinic. The child is entitled to free dental work if the income of the family is \$3 or less per person

per week. The nurse collects eligible children at her school and takes them to the dental clinic and brings them back again. Nurses are scheduled to dental clinics according to an arranged program.

The school dentists receive \$100 per month 10 months of the year. The hours are from 9 a. m. to 3.30 p. m., with one hour for lunch.

Cincinnati.—The health department and the oral hygiene committee of the Cincinnati Dental Society, in connection with the public-school department, operate three free dental clinics for the benefit of public and parochial school children whose parents are unable to pay for dental services. The movement was launched about eight years ago by the Cincinnati Dental Society and was financed entirely by this organization until 1912. The oral hygiene committee still supplements the insufficient appropriation made by the city. The city budget provides \$4,500; the balance is made up by the oral hygiene committee. There is well planned dental inspection once a week in some schools, conducted by members of the Cincinnati Dental Society. Children who are in need of dental services are referred to their dentists, but if unable to pay can take advantage of free clinics. Reasonable effort is made by principals and teachers to minimize the abuse of charity, and they must certify that the cases are worthy of charity.

The dental operators are paid at the rate of \$50 per month for three and one-half consecutive hours per day. The pay of the dental assistants is from \$500 to \$720 per annum.

Detroit.—All free dental work is done under the direction of the board of health. At the present time there are 12 clinics in the city. These clinics are located in school buildings, hospitals, settlement houses, and one in the board of health building. There is a fund of \$20,000 to maintain these clinics, and from this fund the salaries of the inspectors who examine the mouths of children of school age twice yearly are paid. During the past fiscal year some 20,000 children were treated in these clinics. No social service division is maintained in this department, but dependence is made upon the school teachers and nurses to "tip us off" when we are being imposed upon.

Salaries of operators as follows: \$1,000, \$1,200, and \$1,800 per year, respectively; half-time inspectors, \$50 per month. Clinic assistants are employed at the rate of \$40 per month.

STATE LEGISLATION FOR PHYSICAL EDUCATION.

Within the past three years, eight States have enacted laws providing for State-wide physical education, namely, Illinois in 1915; New York in 1916; New Jersey, Nevada, Rhode Island, and California in

See Bureau of Education Bulletin, 1918, No. 40, "Recent State Legislation for Physical Education."

1917; Delaware and Maryland in 1918. In six other States, Massachusetts, Connecticut, Pennsylvania, Nebraska, Ohio, and Colorado, legislative attention has been given to this matter, but no legislation has yet been enacted. In New Jersey and Massachusetts special commissions made exhaustive investigations and reports as the basis for legislative action. Though this legislation in all but two States was enacted prior to the current year, it did not become effective until this year, except in New York and Illinois. In New York, however, the law was amended in 1918 so that the law in final form will not be in full effect until 1918-19.

The most significant feature of this legislation is the broad and comprehensive interpretation of physical education given either in the statutes themselves or in the administrative programs adopted by the State departments of education. In the New York program physical education is interpreted as covering: "(1) Individual health examination and personal health instruction (medical inspection); (2) instruction concerning the care of the body and concerning the important facts of hygiene (recitations in hygiene); and (3) physical exercise as a health habit, including gymnastics, elementary marching, organized supervised play, recreation, and athletics." In the California statute the aims and purposes of the physical education are specified: "(1) To develop organic vigor, provide neuromuscular training, promote bodily and mental poise, correct postural defects, secure the more advanced forms of coordination, strength, and endurance, and to promote such desirable moral and social qualities as appreciation of the value of cooperation, self-subordination, and obedience to authority, and higher ideals, courage, and wholesome interest in truly recreational activities; (2) to promote a hygienic school and home life, secure scientific sanitation of school buildings, playgrounds, and athletic fields, and the equipment thereof."

The Rhode Island syllabus states that "Physical education may be defined as including healthful, sanitary environment; medical inspection; instruction in physiology and hygiene; and exercise in the form of such motor activities as marching, gymnastics, dancing, supervised play, and athletics."

With the exception of the Nevada law, all of these State laws provide for compulsory physical education in all their public schools. The most notable weakness is the failure to provide adequate financial support for administration and supervision, and the failure to provide administrative means for making the laws locally effective.

The results of the first year under the new law in New Jersey are summarized by the State commissioner as follows:

Physical training systematically taught this year for the first time in many schools, will be more effective next year. It has already enlivened the schools.

created new enthusiasms and contributed to the welfare of children and teachers. . . . The public needs to realize that money expended for health education, both rural and urban, is money better spent than for almost anything else. . . . We need not only better medical inspection, but also more school nurses, in country as well as in city. It can not be said with emphasis too great that physical training is preparedness. Its purpose is no other than to increase our man and woman power.

THE NATION'S NEED OF PHYSICAL EDUCATION.

The war has suddenly revealed to us and to all other nations the basic value of human life. It is no longer merely the voice of the philanthropist crying in the wilderness the doctrine of the individual's right to abundance of life; it is the Nation in its hour of crisis demanding the fullest physical capacity of all its men, women, and children. "The truth is pounded home with every succeeding engagement on land and sea that the conservation of human life is now a part of practical affairs, something to receive its place in the everyday consideration of those responsible for national progress." In war's terrible markets human life is the basic legal tender. Money, munitions, ships, and all the other essentials for the prosecution of war are but promissory notes.

This is recognized in the English education bill which at this date (June 30) is in the final stages of passage. It includes provisions for a comprehensive and thorough program of health conservation and physical education. This program covers adequate medical supervision both of children in school and children in industry, and physical education in all elementary, secondary, and continuation schools, and the provision of proper equipment for the same, and provision for physically and mentally defective children.

In France, a strong committee has been formed, of which several members of the Chamber of Deputies are members, for the study and promotion of physical education, social hygiene and race conservation. The committee proposes to cooperate closely with the public authorities, the universities, the faculties, the commercial centers, the industrial centers, the financial powers, and the press.

Its program includes a general method of rational physical instruction; a system of schools of physical education for instructors of the Army and of both sexes; simplification of school programs and introduction of a physical test in all examinations; emphasis upon outdoor exercises; outdoor schools and open-air colonies for physically abnormal children; complete reorganization of school medical inspection; the employment of trained teachers of gymnastics; legislation restricting juvenile labor; and a larger place in the training for military service to physical education and athletics.

In this country, likewise, we are recognizing that physical efficiency of the citizens is not only a matter of individual or local or

State concern, but also a matter of supreme national concern. The fact that the first draft figures show a wide variation in the percentage of physical effectives that the States can contribute to the national defense—an extreme variation of 33 per cent—lifts the question at once into the field of national statesmanship. The experience of the training camps is a conclusive demonstration of the need of a national program that shall produce not only physically sound but also physically educated citizens.

President Emeritus Eliot, of Harvard, in a weighty address on "Certain Defects in American Education" (Teachers' Leaflet No. 5, Bureau of Education, June, 1918) states the case clearly and forcefully:

To secure for every child in the country a complete course of physical training is a great national object in war times and peace times alike, and part of the expense of the course should be borne by the National Government. The Swiss Federal Council prescribes the program of physical training for every school in Switzerland, and appoints and pays the national inspectors who see that this program is carried out. The federation also makes a small contribution to the cost of this training throughout the Republic. The war with Germany has already taught us that the United States should henceforth and at once do the same thing in aid of the much larger expenditures of the States and the municipalities on the same all-important subject, and should make sure that the training is actually given. When a proper course of physical training has been in operation in the United States for 12 to 15 years, the productiveness of the national industries will show a great increase, and the young men who are to fill the permanent Army and Navy of the United States will come to the annual mobilization with bodies already fit for the work of a soldier or sailor.

The commission on the national emergency in education of the National Education Association emphasizes strongly the importance of physical education and health conservation in its program for Federal legislation.

In its bill providing for the creation of a department of education and the encouragement of the States in the promotion and support of education, it specifies that two-tenths of the \$100,000,000 asked shall be devoted to physical education and instruction in the principles of hygiene and sanitation, and for providing school nurses, school dental clinics, and otherwise promoting physical and mental welfare.

The American Federation of Labor in its educational program includes the following planks:

The provision of ample playground facilities as a part of the public-school system.

Continuous medical and dental inspection throughout the schools.

The organization and equipment of special classes for children who are subnormal, either mentally or physically, and also special classes for children who are found capable of making more rapid progress than is possible in a standard school.

The establishment of complete systems of modern physical education.

Numerous patriotic, civic, health, and philanthropic organizations have taken a similar position. A national committee on physical education has been formed with purposes similar to those of the French "committee" already named. More specifically it is devoted to the promotion of State and Federal legislation for physical education. The committee, in its proposed program for Federal legislation, adopts the interpretation of physical education as illustrated in the best recent State laws. "It assumes physical activity as the basic thing, but conditioned upon, and integrally related with, wholesome physical environment, individual physical examination and record, medical supervision of schools and school children, development of health habits and instruction in health knowledge, hygienic school management and procedure, and cooperation with all agencies that make for physical upbuilding and the moral growth inevitably incident to sane, wholesome, active physical life."

It asks that physical education be for boys and girls alike; for all children between 6 and 18 years, inclusive, in all schools and in industry; for provision for investigation and demonstrations in the interest of progressively scientific standards; for Federal aid to the States and Federal cooperation in the administration of all State systems, but with guarantees of State autonomy and initiative.

The National Physical Education Service¹ has been established by the Playground and Recreation Association of America at the request of the national committee on physical education to organize and manage the movement for State and Federal legislation for physical education.

PHYSICAL EDUCATION AND MILITARY TRAINING.

Physical education as interpreted by the individuals and organization cited above is not a substitute for military training. With respect to boys, it is premilitary training. It is a program for producing physically fit men and women by physically educating boys and girls during the period of immaturity. The program stops at 18 years of age. Efficient military training can not begin earlier than 18 years. If universal military training should be adopted, this program would insure maximum preparation of a maximum number of young men for military training. It is preparatory military training in the following ways: By the selection of boys fit for military training through recurrent physical examination during the growth period and the early detection and correction of remediable defects; by systematic training through graded systems of exercises adapted to children of different ages, through corrective

¹ Headquarters, 818 Connecticut Avenue, Washington, D. C.

exercises for postural and muscular defects, and through intensive physical training and athletics for the older boys; by systematic training into health habits and instruction in health knowledge; and by increasing the physical efficiency of those whose defects would confine them to limited service, through early detection of defects, through specialized training of such individuals, and through keeping them out of occupations for which they are unfit.