MEDICAL AND SANITARY

INSPECTION OF SCHOOLS

FOR THE HEALTH OFFICER, THE PHYSICIAN THE NURSE AND THE TEACHER

BY

S. W. NEWMAYER, A.B., M.D.

FORMERLY CHIEF OF DIVISION OF CHILD HYGIENE; ASSISTANT CHIEF MEDICAL INSPECTOR, BUREAU OF HEALTH; SUPERVISOR OF SCHOOL MEDICAL INSPECTION, PHILADELPHIA

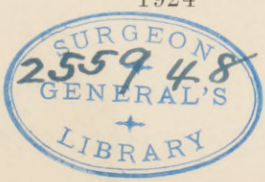
ILLUSTRATED WITH 79 ENGRAVINGS AND 6 FULL-PAGE PLATES

[2. ed.]

LEA & FEBIGER

PHILADELPHIA AND NEW YORK

1924



PRINTED IN U. S. A.

DEDICATED

TO

MY SONS, ALAN AND RICHARD

AND

THE OTHER SCHOOL CHILDREN OF AMERICA

PREFACE TO SECOND EDITION.

THE pioneer days of school health supervision are over. Today one does not ask "Shall we have medical supervision?" but "How shall it be performed?" not "What is this or that city doing?" but "What is the best method suited for our needs?"

Education is preparation for life, and we get that preparation largely through studying and understanding present day problems, of which safe living is one of no minor importance. Cities or towns which pay no attention to the physical comfort and welfare of its children are truly behind in the progress of civilization. Never has there been such an opportunity to teach the correct habits of safe living in a way that will appeal to all. Never has there been such an opportunity to instil into the young an appreciation of the value of sound bodies and minds and to show them how to acquire them. Public health is on a sharp upward curve and our actions and teachings must travel with it if we would progress.

We cannot hope to practise public health and teach hygiene according to old standards any more than we can conduct our large industries and business according to old standards.

The main object of the author is to give knowledge rather than information. This book does not pretend to furnish statistics of what cities are doing nor how each performs the work. Several large cities with highly organized systems are cited to aid organization. The methods of many cities and towns were studied, the good practical features noted and these, including the author's twenty-four years of experi-

ence and thought, are offered to the reader as "ideal" in the sense that they represent the best practice of the day in each of the various activities of school health supervision. There is nothing visionary about them, for they have been proven satisfactory somewhere.

The deficiencies of the first edition due to immature development of the subject have been eliminated. The valuable advice of critics has been heeded where well founded. The entire sphere of school inspection has broadened in the past decade and therefore chapters on new phases have been added. Old subjects, such as communicable diseases, have been revised in accordance with scientific progress and the teachings and opinions of experts in the medical profession.

The author desires to express his appreciation to the hundreds of people in all walks of life, authors, teachers, physicians, dentists, sanitarians, builders and others from whom he obtained valuable data and information through talks, correspondence and use of their writings. He hopes that those who recognize their thoughts in these pages, will take for granted the author's expression of thanks.

S. W. N.

PHILADELPHIA, PA., 1924.

CONTENTS.

PART I.

ADMINISTRATION.

PART II.

THE SCHOOL BUILDING AND GROUNDS.

PART III

COMMUNICABLE DISEASES.

PART IV.

PHYSICAL DEFECTS.

PART V.

THE HEALTH OF TEACHERS.

PART VI.

MENTALITY.

PART VII.

ALLIED SUBJECTS OF SCHOOL MEDICAL SUPERVISION.

MEDICAL INSPECTION OF SCHOOLS.

INTRODUCTION.

PUBLIC education is a question which vitally concerns the national government, as well as every state, city and district, and includes within its scope all classes and races. In its general management the problem is identical for every state, city, and town, but the details, depending as they do on surrounding conditions, are chiefly local matters coming under the supervision of the local authorities without outside interference. In the United States 20,000,000 children, or one-fifth of the entire population, are enrolled in the public schools.

The salaries paid to teachers each year amount to more than $200,000,000, and the total expenditures on public schools exceeds $400,000,000. Besides this enormous annual expenditure there is a permanent investment in public school buildings amounting to over $900,000,000. This requires the levying of a heavy taxation on the people. There is a "general" tax which is levied on the citizens of the State as a whole and a "local" or self-imposed tax levied by each city or town. Four-fifths of the school taxes are of this kind. That this additional burden is cheerfully borne is ample evidence that the people realize the importance of the proper education of children. Not only do the people give willingly of their income, but many of the best and most influential citizens give their services freely in acting as directors for the management of these institutions. To

make this great expenditure for education effective, there must be good teaching, and children physically adapted to take advantage of the education offered.

The progress in medical science, due largely to laboratory research and sociological investigation, has brought to light the causative factors of disease and demonstrated that many are preventable; thus making possible the great advances in preventive medicine, sanitation, and hygiene. Diseases formerly looked upon as visitations of Providence are now known to be almost entirely preventable, and the preservation of health and life by preventive measures has become the watchword of the medical profession. The relation of the schools to these achievements of medical science is of great importance. These endeavors on the part of the medical profession have brought the physician in contact with the school, and have claimed his interest in educational affairs. The physician soon noted the close association between the mental and physical condition of the child. Simultaneously, the teacher outgrew the early educational methods of teaching *en masse*, and advanced to the modern methods in pedagogy of teaching the individual child. Both teacher and physician noted the marked variations in the mental capacities of different pupils, and recognized the importance of a combined study of the causative factors. To them, therefore, medical inspection of schools owes its existence.

Twenty-five years of school medical inspection in America and almost fifty years abroad have carried us beyond the question of why such work is needed, and have placed the best and most efficient methods and systems within our reach. There are few doubters and disbelievers, but such dissenting voices will always be heard for the same reasons that there are people who are opposed to vaccination and antitoxins, or progress along any line. The value of medical inspection of schools needs no greater endorsement than the fact that many of the State legislatures have passed

laws authorizing the establishing of a system of inspection, and in numerous States medical inspections are mandatory.

The history of medical inspection of schools includes the history of both the school doctor and the school nurse. England was one of the first countries to look after the physical needs of the school child. There nurses were appointed before physicians; in America the process was reversed.

School nursing may be considered as a development of visiting nursing. The latter originated in England about 1860 and reached America in 1877, when a New York City Mission sent the first trained nurse into the homes of the poor. Before 1905 the work was sporadic, but since then it has gained considerable headway.

The school nurse, representing a new idea in visiting nursing, began work in Liverpool in 1887, when nurses paid daily visits to a few schools for the purpose of attending to minor injuries and complaints. They also called at the homes of children who had more serious ailments and urged the parents to obtain the services of a physician. The early school nurses were volunteers, and it was not until 1901 that the London School Board appointed salaried municipal school nurses, with definite duties assigned. They examined the children for contagious skin diseases and excluded all cases found. The nurses did not treat the cases, and consulted only occasionally with the school medical officer. Later the nurse tested the vision and hearing, and kept a record of the physical examinations of the pupils. In 1907 a superintendent, and, recently, assistant superintendents were appointed.

The first school medical officer was appointed in London in 1891. His duties were to examine absentees from school who failed to furnish a doctor's certificate. The following year, Dr. Francis Warner published a full report of the examination of 50,000 school children.

In America, Boston is credited with having established

the first system of school inspection, in 1894. New York had a medical inspector, Dr. Moreau Morse, in 1892, but did not establish a system of inspection until 1897. One hundred and fifty physicians were appointed that year by the Department of Health to inspect the school children. These physicians received a salary of $30 a month, and their duties consisted in visiting the schools each morning, to examine all children sent them by the teachers as suspicious cases of contagious disease. This system was in effect until 1902, when the inspectors were required to give more time to the work, and the salary was increased to $100 per month. The system was then elaborated to include a routine inspection of all children in the class-rooms for the purpose of detecting cases of contagious eye and skin diseases. Home visits were made to absentees to detect unreported cases of contagious disease.

The routine inspection of children in the class-rooms resulted in the exclusion from school of large numbers with cases of minor contagious diseases. It was evident that such exclusions had a limited value, and in many instances had a harmful effect, as the cases were not considered by the parents of sufficient importance to warrant medical treatment. This procedure caused enforced absence from school, and not only interfered with the education of the children, but often made them habitual truants.

At this time experiments were made with a trained nurse, Miss Lina L. Rogers, who volunteered to do the work. The result showed not only marked improvement in school attendance, but demonstrated that all danger of infection could be controlled, and that the children could remain at school without danger to themselves or their classmates.

As a result of this experiment the first staff of municipal nurses to be employed in the United States was established in November, 1902, by the Department of Health of the City of New York. In December, 1902, a hospital and dispensary for the treatment of contagious eye diseases was established

by the same department, and in 1905 the medical inspectors began complete physical examinations of all school children.

Notwithstanding these many changes, the results hoped for did not materialize. The physicians and nurses succeeded in obtaining for treatment only 6 per cent of the physically defective children. The records soon amounted to little more than a mere compilation of statistical data, and very little to show for the work. This resulted in the organization of the Division of Child Hygiene, and a largely increased staff of trained nurses.

Experiments showed the economy and efficiency of placing the control of contagious diseases in schools in the hands of the school nurse, leaving the medical inspector free to devote his entire time to making physical examinations of the children. In January, 1912, this system of medical inspection was inaugurated, utilizing the services of 74 medical inspectors and 179 nurses, under the supervision of a staff of supervising inspectors and supervising nurses.

In 1901, the author started a daily class-room inspection of the school children in Philadelphia, and in 1903 inaugurated a system of inspection, utilizing the services of a trained nurse. The success of this work resulted the following year, in the organization of a corps of 50 medical inspectors to perform the work in the schools and control contagious diseases.

In 1911, by act of legislature, a "School Code" was enacted which made medical examination of public school children mandatory in the State of Pennsylvania. To assure such services to all children of school age, the Bureau of Health of Philadelphia promulgated rules and regulations for examination of all pupils of private and parochial schools, to be done by the inspectors of the Division of Communicable Diseases. A separate corps of 50 inspectors and 4 supervisors under a director and conjointly supervised by the Bureaus of Education and Health had charge of the medical work in the public schools. A corps of 40 nurses under a head nurse performed

the follow-up work. This corps has been increased to 8 supervisors, 70 physicians and 80 nurses, and in 1924 was further increased by addition of 12 inspectors and 18 nurses. The objects of the work include:

1. The detection of contagious diseases, thereby protecting the child and the community.

2. The detection of physical defects which prevent the child from acquiring a full education with the least sacrifice to his physical welfare.

3. To find the capacity of the individual pupil to acquire knowledge in accordance with his mental and physical status.

4. To insure the best possible hygienic surroundings for the child while he is in school.

5. To bring a closer relationship between the school and the home so as to carry out more successfully the other aims of medical inspection and insure treatment for discovered defects.

6. To teach the practice of hygiene and healthful living both in school and at home.

PART I.

ADMINISTRATION.

GENERAL CONSIDERATIONS.

INVESTIGATION of the work performed in 500 cities and towns of the United States shows variations from completely organized, efficient systems, to unorganized and partial inspections of the school children. The inspections are made by physicians, nurses, and teachers, independently or in any combination, and in some instances by physical instructors.

Medical inspection of schools is logically most effective when the work is performed by trained physicians, whose services are required when a thorough physical examination is desired. Nurses, teachers, and other laymen may perform a number of the duties, but diagnosis and medical judgment can be obtained only from physicians, who may be part of the staff or volunteer consultants. Volunteer work has rarely proved successful. When something is required for nothing, one cannot command, and services are rendered at the will and desires of the giver. A volunteer often looks for a subsequent reward and if it is not forthcoming he stops work. Small cities or towns which believe they cannot afford the usual compensation for medical services should at least provide a small fee and avoid the uncertain services obtained from volunteer work.

The Need of Medical Inspection.—Thirty years of progress since the first system inaugurated in Boston, has eradicated

all arguments on the need of systematic medical supervision. It is recognized as a necessary part of every educational institution. There are in the United States about 350 cities and towns with populations of 10,000 or over, which have some form of school inspection. The enthusiasm is not confined to the medical profession, as educational executives, school officials and in most instances the public demand these services. No small amount of the progress in public health in the past two decades can be attributed to work started in school inspections. There is no state which does not report in one or more cities some attempt to render medical school services.

Supervision.—In the early days of school medical inspection, the supervision in the majority of cases was controlled by the boards of health. As the work passed out of the experimental stage the boards of education took over control or conjointly supervised. At present about three-fourths of the cities vest the work solely in their boards of education; one-eighth conjointly between the two bureaus; and one-eighth depend on their health departments. The number of towns dependent on private organizations is practically negligible.

The advantages claimed for vesting the power in either the educational or the health departments are varied. Where the only or chief object of the work is the detection of and protection against communicable diseases, there is ample reason for the health department to supervise; where the system has progressed to include the numerous endeavors which correlate physical defects to pedagogy, the educational authorities seem to be preferable. There may be less political interference in educational circles, and the appointments may be more satisfactory, as well as ability to discharge for inefficiency.

Dual responsibility by health and educational departments, though existing in almost a fourth of the large cities, seems to be faulty. This is so because of the sound general business

principles that no one can serve more than one boss. It matters little which department supervises, but results can be obtained only if there is the greatest harmony and coöperation between the two important bureaus.

Neighboring towns with a few schools and a small school enrollment may have the same inspector, and arrange to have visits one or two days each week for physical examinations. The physician could place himself at other times on call for emergencies.

The corps of nurses, through their supervisor, should be responsible to the same source as its medical inspectors. In large organizations the system of placing responsibility must resemble any large industrial organization.

Neighboring towns with a few schools and a small number of pupils may have the same inspector, and arrange the work so he shall devote one or two days each week to examine the children in a district. This physician should be under the supervision of the board of health of the county.

In cities where a staff of physicians and nurses are employed the administrative responsibility is vested either in the board of health or the board of education. In the early years of medical inspection, the boards of health had the supervision in most of the cities, but at present about three-fourths of the cities vest such power in the board of education. As to which is the more desirable is a much mooted question. To the author it seems that there is little difference provided both of these departments work in harmony. The department least dependent upon political activity and most successful in obtaining appropriations is the one which will achieve the most desirable results.

Cost of Maintenance.—The cost of maintenance varies with the school population, the amount and character of work required, and the efficiency of the examiners. The greatest expense is in the salaries for the inspectors, nurses and clerks; printing, supplies, and minor expenditures are a relatively small item even in large cities.

The character and amount of services rendered are often in proportion to the salaries paid. A city that pays a small salary and requires more than three hours' work each day is apt to have the work either slighted or performed by disinterested men unskilled in the best professional knowledge. It is more advantageous to have a small corps of a high standard of efficiency and well paid, than a large one with less efficiency and small salaries. It is a mistake to require physicians to devote their entire time to the work. Half a day or the morning session is sufficient for school inspection, and the remainder of the day should be allowed for private or hospital practice. Such an arrangement assures more ambitious and better trained men.

The annual salaries of school physicians varies from gratis in volunteer service to $5000 in executive supervisory capacity. The general rate for the usual part-time service is $1000 to $1500 payable in ten monthly payments.

The annual cost of health supervision per pupil where organized systems exist is about $1.25. This rate is increased for small school population and decreased in large cities. The cost is very variable depending on many factors. A capable director with business ability can make great savings by wise allotment of work, avoiding waste of time on impractical experiments, and wasted printing of useless forms and literature.

The joint committee of the National Education Association and the American Medical Association has made an extensive survey of the health service in the schools of the United States. Several of their tables are here quoted.

TABLE I.—ANNUAL COST OF HEALTH SUPERVISION AND PHYSICAL EDUCATION PER PUPIL.

Annual cost.	All cities.	Under 10,000	10,000 to 25,000	25,000 to 50,000	50,000 to 100,000	100,000 and over.
$.00 to .24	15	1	10	3	..	1
.25 to .49	19	1	9	2	2	5
.50 to .74	29	..	17	8	2	2
.75 to .99	24	..	8	8	3	5
1.00 to 1.24	39	1	20	9	4	5
1.25 to 1.49	26	..	18	1	2	5
1.50 to 1.74	25	2	16	5	2	
1.75 to 1.99	13	..	7	2	3	1
2.00 to 2.24	25	1	17	4	2	1
2.25 to 2.49	7	..	1	1	4	1
2.50 to 2.74	14	1	7	4	..	2
2.75 to 2.99	1	..	1			
3.00 to 3.24	15	1	6	4	1	3
3.25 to 3.49	5	..	1	1	1	2
3.50 to 3.74	6	..	3	2	..	1
3.75 to 3.99	2	1	1			
4.00 to 4.24	6	1	2	1	1	1
4.25 to 4.49	2	..	1	1		
4.50 to 4.74	2	..	1	..	1	
4.75 to 4.99	1	..	..	1		
5.00 to 5.24	2	..	2			
5.25 to 5.49						
5.50 to 5.74						
5.75 to 5.99						
6.00 to 6.24	1	..	..	1		
6.25 to 6.49	1	..	1			
6.50 to 6.74						
6.75 to 6.99						
7.00 to 7.24	1	..	..	1		
7.25 to 7.49						
7.50 to 7.74						
7.75 to 7.99						
8.00 to 8.24	1	..	..	..	1	..
	282	10	149	59	29	35
Median	$1.37	$1.74	$1.39	$1.24	$1.74	$1.24
Quartile 1	.82	1.12	.77	.80	.99	.79
Quartile 3	2.21	3.12	2.09	2.55	2.37	2.62

NOTE.—Median is that point on the scale at which one-half of the cases fall below it and one-half of the cases are above it. First Quartile (25 per-centile) is that point on the scale at which one-fourth of the cases fall below it and three-fourths of the cases are above it. Third Quartile (75 per-centile) is that point on the scale at which three-fourths of the cases fall below it and one-fourth of the cases are above it.

TABLE II.—CITIES AND STATES HAVING HEALTH SUPERVISION FROM WHICH REPORTS WERE RECEIVED.*

ALABAMA
- Anniston
- Bessemer
- Birmingham
- Gadsden
- Montgomery
- Selma

ARKANSAS
- Fort Smith
- Little Rock
- N. Little Rock

CALIFORNIA
- Bakersfield
- Berkeley
- Eureka
- Long Beach
- Los Angeles
- Oakland
- Pasadena
- Pomona
- Redlands
- San Diego
- San Francisco
- San Jose
- Santa Barbara
- Vallejo

COLORADO
- Boulder
- Denver
- Pueblo
- Trinidad

CONNECTICUT
- Ansonia
- Bridgeport
- Danbury
- Manchester
- Middletown
- Naugatuck
- New Britain
- Norwalk
- Norwich
- Stamford
- Torrington
- Wallingford
- Willimantic

DELAWARE
- Wilmington

DISTRICT OF COLUMBIA
- Washington

FLORIDA
- Pensacola

GEORGIA
- Athens
- Atlanta
- Augusta
- Brunswick
- Rome
- Savannah

IDAHO
- Coeur d'Alene
- Pocatello

ILLINOIS
- Aurora
- Cairo
- Canton
- Champaign
- Chicago
- Chicago Heights
- Cicero
- Danville
- Decatur
- Galesburg
- Joliet
- La Salle
- Lincoln
- Mattoon
- Moline
- Oak Park
- Quincy
- Rockford
- Rock Island
- Springfield
- Waukegan

INDIANA
- Elwood
- Huntington
- Indianapolis
- Kokomo
- Lafayette
- Laporte
- Michigan City
- Muncie
- South Bend
- Terre Haute

IOWA
- Cedar Rapids
- Clinton
- Davenport
- Fort Dodge
- Iowa City
- Keokuk
- Marshalltown
- Mason City
- Muscatine
- Ottumwa
- Sioux City

KANSAS
- Atchison
- Coffeyville
- Hutchinson
- Kansas City
- Lawrence
- Leavenworth
- Parsons
- Wellington

KENTUCKY
- Frankfort
- Lexington
- Louisville
- Newport
- Owensboro
- Paducah

LOUISIANA
- Alexandria
- New Orleans

MAINE
- Augusta
- Bangor
- Waterville

MARYLAND
- Hagerstown

* Prepared by DR. THOMAS D. WOOD, 525 W. 120 Street, New York City.

MASSACHUSETTS
- Arlington
- Attleboro
- Beverly
- Boston
- Brockton
- Brookline
- Cambridge
- Chelsea
- Clinton
- Everett
- Gardner
- Gloucester
- Greenfield
- Holyoke
- Lynn
- Malden
- Marlboro
- Melrose
- Methuen
- Milford
- New Bedford
- Newburyport
- Newton
- Northampton
- Pittsfield
- Plymouth
- Revere
- Southbridge
- Springfield
- Wakefield
- Watertown
- Webster
- Westfield
- Weymouth
- Woburn

MICHIGAN
- Escanaba
- Ironwood
- Jackson
- Manistee
- Marquette
- Saginaw-East Side
- Traverse City

MINNESOTA
- Mankato
- Stillwater
- Virginia

MISSISSIPPI
- Jackson

MISSOURI
- Hannibal
- Jefferson City
- Sedalia

MONTANA
- Anaconda
- Billings

NEBRASKA
- Hastings
- Omaha

NEW HAMPSHIRE
- Concord
- Laconia
- Nashua
- Portsmouth

NEW JERSEY
- Asbury Park
- Atlantic City
- Bayonne
- Bridgeton
- Elizabeth
- Hackensack
- Hoboken
- Irvington
- Jersey City
- Long Branch
- Millville
- Montclair
- Morristown
- Newark
- North Bergen
- Orange
- Passaic
- Paterson
- Perth Amboy
- Plainfield
- Town of Union
- Trenton
- West Hoboken
- West New York

NEW MEXICO
- Albuquerque
- Santa Fe
- Silver City

NEW YORK
- Babylon
- Batavia
- Beacon
- Buffalo
- Corning
- Cortland
- Dunkirk
- Fulton
- Geneva
- Glens Falls
- Gloversville
- Hornell
- Hudson
- Jamestown
- Johnstown
- Middletown
- Mt. Vernon
- Newburgh
- New York City
- Niagara Falls
- North Tonawanda
- Ogdensburg
- Ossining
- Oswego
- Plattsburg
- Port Chester
- Poughkeepsie
- Rome
- Saratoga Springs
- Schenectady
- Syracuse
- Utica
- Watervliet

NORTH CAROLINA
- Durham
- Greensboro
- Wilmington

NORTH DAKOTA
- Minot

OHIO
- Akron
- Alliance
- Bellaire
- Cambridge
- Canton
- Cincinnati
- Cleveland
- Columbus
- Dayton
- East Liverpool
- Elyria
- Findley
- Lancaster
- Lorain

OHIO—*Continued*
Marietta
Piqua
Portsmouth
Springfield
Steubenville
Tiffin
Toledo
Warren
Youngstown
Zanesville

OKLAHOMA
Guthrie
Muskogee
Oklahoma City
Shawnee

OREGON
Astoria

PENNSYLVANIA
Allentown
Altoona
Bethlehem
Braddock
Carbondale
Carlisle
Carnegie
Coatesville
Dubois
Easton
Erie
Farrell
Harrisburg
Haselton
Homestead
Lebanon
Mahanoy City
McKees Rocks
Monessen
New Castle
Norristown
Oil City
Philadelphia
Phoenixville
Pittson
Pottsville
Reading
Sunbury
Washington
West Chester
Wilkinsburg
York

RHODE ISLAND
Newport
Providence
Warwick

SOUTH CAROLINA
Charleston
Spartanburg

SOUTH DAKOTA
Aberdeen

TENNESSEE
Jackson
Memphis
Nashville

TEXAS
Beaumont
Cleburne
El Paso
Fort Worth
Galveston
Marshall
Palestine
San Antonio
Tyler
Waco

UTAH
Provo
Salt Lake City

VERMONT
Bennington
Rutland

VIRGINIA
Danville
Newport News
Norfolk
Portsmouth
Richmond
Staunton

WASHINGTON
Aberdeen
Bellingham
Seattle
Spokane

WEST VIRGINIA
Parksburg
Wheeling

WISCONSIN
Appleton
Beloit
Eau Claire
Green Bay
Marinette
Milwaukee
Oshkosh
Superior
Wausau

WYOMING
Cheyenne
Sheridan

TABLE III.—DISTRIBUTION OF CITIES ACCORDING TO THE INDIVIDUALS CONDUCTING THE HEALTH EXAMINATION. 327 CITIES REPORTING.

	Number of cities.	Percentage.
School physician	98	30.0
School physician and school nurse	97	29.7
School nurse	75	22.9
Health officer	19	5.8
School physician, school nurse and physical training teacher	7	2.1
Health officer and school nurse	5	1.5
Outsiders	5	1.5
Red Cross	4	1.2
School physician and teacher	3	0.9
Physical training teacher	3	0.9
School nurse and dentist	3	0.9
School nurse and teacher	2	0.6
School nurse and physical training teacher	2	0.6
School physician and dentist	2	0.6
Health officer and teacher	1	0.3
Health teacher and health center physician	1	0.3
Total	327	99.8

Laws on the Medical Inspection of Schools.—The movement providing for medical inspection of schools has received considerable recognition from the legislatures of some States; and at the present time many States have laws making inspection compulsory in certain cities or districts. Of this group, Pennsylvania, through its "School Code," enforces compulsory inspection in all public schools. In Indiana there is a most stringent statute, which compels physical examinations in Indianapolis. This law applies to all public, private, and parochial schools, and specifies the tax rate for this purpose. In Ohio the cities must and the rural districts may perform the work. In New York, the children in most of the large cities are examined.

Many States, such as Georgia, Kentucky, Louisiana, Maryland, Mississippi, Rhode Island, South Carolina, and Virginia have no legislation on medical inspection, but there are efficient systems of inspection in many of the cities in the territory. For example, there are 4

cities in Virginia, 5 in Georgia and 8 in Rhode Island that have efficient systems of school inspection without any legislative power for so doing.

Finally, there is a group taking in California, Connecticut, Minnesota, Washington, and the District of Columbia that has by legislation permissible examinations.

The foregoing shows the absolute lack of any concerted action on the part of the States in regard to the medical inspection of schools. In one case the law may be so complete as to specify how frequently examinations shall be made; and again, the physical examinations may consist of nothing more than the testing of hearing and vision by teachers. Nevertheless, what legislation exists at the present time represents progress, and although it is not absolutely necessary to the adoption of medical inspection in schools, it is of great assistance to the work, defines the powers and duties of those in charge, and gives official recognition which aids in obtaining results.

The "School Code" of Pennsylvania contains the following provisions for medical inspection of schools:

12. School Medical Inspectors.

a. Medical and Sanitary Inspection.

SECTION 546. 1, Such medical inspection (annually of all the pupils of the public schools) shall be made in the presence of the parent or guardian of the pupil, when so requested by parent or guardian.—18 May, 1911, art. 15, §1501, P. L. 391.

SECTION 547. 2, The medical inspectors shall, at least once each year, inspect and carefully test and examine all pupils in the public schools of their districts, giving special attention to defective sight, hearing, or other disabilities and defects specified by the (State) commissioner of health in his directions for the medical examinations of schools. Each medical inspector shall make to the teacher, or, if the board of school directors so directs, to the principal or district superintendent of schools, a written report

concerning all pupils found to need medical or surgical attention, and giving careful directions concerning the care of each pupil who needs special care while in school. The teacher, or the principal, or district superintendent shall keep such report until the end of the school year, shall carry out as carefully as possible said directions concerning the special care of pupils while in school, and shall promptly send a copy of the medical inspector's report upon each child to the parents or guardian thereof.—18 May, 1911, art. 15, §1505, P. L. 392.

SECTION 548. 3, The medical inspector shall, at least once each year, and as early in the school term as possible, make a careful examination of all privies, water closets, urinals, cellars, the water-supply, and drinking vessels and utensils, and shall make such additional examinations of the sanitary conditions of the school buildings and grounds as he deems necessary, or as the regulations of the State department of health, or the rules of the board of school directors or of the local board of health require. He shall see that the laws of the commonwealth relating to the health and sanitation of the public schools and the requirements of the local board of health are complied with.—18 May, 1911, art. 15, §1506, P. L. 392.

SECTION 549. 4, (The medical inspector) shall promptly make such reports to the (State) commissioner of health as are required by him or by the regulations of his department, and such reports to the local boards of school directors as he deems necessary, or as are required by the (State) commissioner of health or by the board of school directors. He shall perform such other duties as may be required by the health and sanitation laws of this commonwealth or by the board of school directors.—18 May, 1911, art. 15, §1507, P. L. 393.

SECTION 550. 5, No person having tuberculosis of the lungs shall be a pupil, teacher, janitor, or other employee in any public school, unless it be a special school carried

on under the regulations made for such schools by the (State) commissioner of health.—18 May, 1911, art. 15, §1509, P. L. 393.

Legislation pertaining to the physical examination of school children should provide for the inspection of all pupils whether in private, parochial, or public schools. The examinations should be compulsory and not at the option of the school authorities. Likewise teachers and janitors should be subjected to physical examinations.

To avoid friction between the educational and health authorities, the statute should specify which department is to assume responsibility for both maintenance and administration. For the guidance of the administrative officers the duties of the inspectors should be clearly set forth and provision made for the enforcement of certain recommendations of the examiners. To cover cases where it is impossible to persuade parents to obtain treatment for physical defects which hinder the education of the child, some penal provision should be made to insure the proper execution of any law imposing a duty upon the people.

If there are no public health laws which authorize the exclusion from school for the failure to receive a vaccination against smallpox, or where a communicable disease exists, such provisions should be made in legislation on school inspections.

THE MEDICAL INSPECTOR.

Systems of medical inspection which have for their object not only the detection of cases of contagious diseases but also the diagnosis of physical defects, require trained physicians as inspectors. Some cities and towns conduct the examinations of pupils without the immediate service of a physician. In such cases the work is performed by teachers or nurses, but their diagnosis is, or should be, submitted to a physician for confirmation. These teachers

or nurses should not be called medical inspectors. They are valuable accessories to medical inspection, and each have their place. They may perform equally as well such duties as testing of vision or hearing, but there are few other defects which they can diagnosticate with certainty and safety. School inspections frequently require medical services, and these cannot be rendered by a teacher or a nurse. They are not graduates of a reputable medical school and licensed by the State to practise medicine in all its branches, therefore they are not legally qualified to perform medical duties.

In towns where it is impossible to command the services of a physician, the teacher or a nurse may act in the capacity of examiner and refer suspicious cases to a physician who may volunteer his services.

Number of Inspectors Required.—The present systems with their varied and many duties compared with early pioneer days, require placing 3000 pupils as the maximum number to be supervised by one inspector. In suburban or rural districts 2000 is a sufficient number. Figures will vary with the amount and character of work to be done; depending on the number of pupils in a school, the distance between the buildings, the character of the population, the probable number of defects found, and the system of inspection employed. Where the schools are situated, in suburban or outlying sections, several miles apart, an inspector should take a smaller number of pupils, as much time is lost travelling between the schools. In a congested section of the city with schools close together, he can spend more time in actual work. Among the foreign population a greater number of defects exist, and more time is required to have recommendations carried out. On the other hand, if the children are American born, parents generally attend to their physical needs promptly, requiring less effort on the part of the medical inspector. The school population that should be assigned to one inspector also varies with the number of duties and the

system of inspection employed. A system overloaded with clerical work decreases the probable number of pupils that can be efficiently cared for.

Examinations where parents sign consent cards is a mistake as often those with glaring defects fail to procure consent. Examinations by family physicians instead of authorized medical inspectors proved a failure in New York because results were unsatisfactory even with a regulation form furnished.

Qualifications and Training of Inspectors.—Any competent, conscientious physician may be trained for the position of medical inspector. The great number of applicants for these positions makes it difficult at times to choose. The "merit system," or civil service examination, which eliminates favoritism and political interference, has solved the problem in those cities where such methods are adopted. Where practical questions pertaining to duties of the position have been asked, and due allowance made for previous training, the civil service method has been successful.

The appointment of physicians as school inspectors, where civil service examinations and rules are not observed, should require much though by the appointing powers. The personality of the doctor, his previous training, his interest and enthusiasm in the work, are all worthy of consideration. It is desirable to have a physician who has had previous training in the diagnosis of contagious and skin diseases, and practical knowledge of some of the specialties, particularly the eye, ear, nose, and throat. Internes from hospitals for contagious diseases receive valuable training for this work. Previous experience in some social work, giving an idea of the relation of home conditions to physical defects, serves the inspector in a number of ways, and should be considered in making an appointment. Several universities offer a special course to those desiring to apply for such positions. It is unfortunate that more of the medical colleges do not offer special courses to train physicians in this

new postgraduate work. In the author's opinion, if the remuneration to medical inspectors was larger, more men would take special courses to better qualify for the positions. That there are methods of training a corps of physicians after appointment is true, but the time which can be spared for such instruction is limited. Such after-training may consist in personal instruction at a hospital for communicable diseases, and lectures on skin diseases and the other specialties by experts. Instructions on the practical work in the schools may be given by supervisors or trained inspectors.

Duties of Inspectors.—The physician should visit daily all the schools assigned to him. He should examine the children sent by the teachers for suspicious signs of contagion. Accuracy in diagnosis is necessary to prevent epidemics. When a communicable disease is found in a school, every precaution must be taken to prevent the occurrence of other cases.

The medical examiner should not only diagnose physical defects which may handicap a child in its schooling, but also try every conceivable means to have such defects corrected. The glaring defects may be called to the physician's notice by a teacher, but the greater number must be found by a thorough systematic physical examination of each child.

The responsibility of the school physician for the healthful living of the children at school and at home is of importance. He should recognize insanitary and unhealthful conditions at school, which may cause illness, and aid the teacher in her instructions on hygiene, thereby directing the children in proper living at home.

Investigations and reports from various cities often estimate the amount of work performed by medical inspectors by the number of pupils examined and number of hours spent in doing the work. These are poor criterions. Quantity is a minor consideration compared with quality, which is measured by results obtained, especially in the correction

of defects found. The work performed naturally varies with the capabilities of the inspectors. Some are quick and accurate in diagnosis, interested and persistent, and at the same time tactful in recommendations to parents, thus achieving results. Others fail to recognize important physical defects and even contagion. Furthermore, they may be disinterested and fail to obtain results from recommendations. Due allowance must be made for the character of school population. Most of the foreign element take kindly to recommendations for treatment, provided the inspector aids them in obtaining the necessary medical assistance. Some parents, however, resent being told that their children have certain defects, and object strongly when urged to seek advice. Many of these cases are converted by tactful consultations between physician and parent.

Equipment of Medical Inspectors.—The equipment needed for the medical examiner depends on the duties he is to perform and whether they include the supervision of contagious diseases in the homes. If he enters infected houses he should carry a leather bag containing a gown of rubber or white duck, a cap, pair of rubbers, lysol or bichloride of mercury tablets for disinfections of hands, rubber gloves, syringe for administering antitoxin, placards and literature issued by the health department for instruction of families. The contents of the bag can be constantly disinfected by adding to the equipment a tin box with perforated lid containing gauze kept wet with formalin. White duck or muslin gowns, towels and other washable equipment which permit of boiling should frequently be so treated.

An ample supply of blanks and cards for recording the work performed should be carried or kept at the schools. Few cities allow the medical examiners to undress children for thorough physical examinations, and he must, therefore, depend more upon subjective signs and symptoms than upon the use of instruments of precision to diagnose defects. A stethoscope is occasionally required for examinations of

the chest. Culture outfits for the laboratory diagnosis of diphtheria are frequently required.

Vaccine virus and diphtheria antitoxin should not be carried by the inspector unless for immediate use. Virus and antitoxin not kept on ice rapidly deteriorates and becomes inert.

In each school there should be a room set aside for the inspector and nurse in which examinations can be made. This room should be well lighted and if possible at least 20 feet long, to admit of examination of vision.

Several test cards should be placed on the wall in a good natural or artificial light. Running water at a sink or wash bowl is necessary. A small medicine closet should be equipped with such supplies as may be required for emergency—bandages, cotton, adhesive plaster, collodion, bichloride tablets, aromatic spirits of ammonia, alcohol, and a number of wooden tongue depressors. The latter are inexpensive, and can be thrown away after an examination, a distinct advantage over a metal depressor carried by the inspector. Toothpicks or wooden applicators are handy for many purposes. This same closet may contain the equipment necessary for the nurse, such as ointments and lotions. All poisons should be kept separate and in colored bottles plainly labeled "poison." This closet should always be kept locked, and when not in use the key kept in the office of the principal. A supply of record blanks and literature for instruction should be in each school.

Additional Work during Summer.—Where medical inspectors are under the supervision of the health department, and paid for twelve months' work, they can be utilized during the summer months in campaigns to reduce the mortality among infants. They can supplement the inspectors engaged on contagious disease, and if smallpox is prevalent, they can constitute a special vaccinating corps. In Philadelphia the parochial and private schools are medi-

cally supervised by the corps of inspectors of the Bureau of Health. The lessened number owing to summer vacations doubles the assignment on communicable diseases. Where the examiners are employed by the Board of Education, they should be subject to the same rules as teachers and allowed the summer months free. Where summer schools exist, those attending have received physical examinations earlier in the year and the occurrence of communicable diseases is rare.

DIRECTOR AND SUPERVISORS.

Qualifications and Training.—In cities employing a large number of inspectors, it is necessary to have a director, or chief of the division, and, if numbers warrant, one or more assistants or supervisors. A supervisor can manage 10 to 15 medical inspectors. The director is responsible to the superintendent of schools or the head of the health department. His duties are to superintend the work of all the inspectors. If supervisors or assistants are employed, they are responsible to the chief or director for the work performed by the men under them. The success of the department is largely dependent upon the efficiency of the director. He must have executive ability combined with a thorough knowledge of the subject of medical inspection. He should know the sections of the city in relation to social conditions. A man of education and refinement, coupled with a pleasing personality, is one much desired. Tact and diplomacy will serve him well on many occasions. Resourcefulness, friendliness, and firmness, coupled with gentleness, are traits of value. He should be a good teacher and disciplinarian, capable of directing wisely. His strength, energy, and judgment should not be dissipated on small details and minor duties, which can be cared for by others whose times is less valuable.

The only previous training which will prepare a physician

for the position of director is former service as a medical inspector and experience in some executive position which entailed his managing others. The same qualifications are required for his supervisors or assistants.

Duties.—The director must outline a practical system of inspection suited for his city. The system must be simple and not burdened with unnecessary clerical work. He has under his care a number of men with varying ability and personalities, and it is his duty to organize his corps that there shall exist uniformity in the work. The physician who has formerly specialized on the eye, must be watched that he does not report only eye defects; the nose and throat specialist must be discouraged from devoting too much attention to these organs, and so on with all the specialists. However, it is well where another inspector is in doubt, to utilize the knowledge of those men in the department who are experts on the subject. The director does well to gain the admiration and respect of his men by kindness and thoughtfulness. When one man has failed to do a thing properly, the individual should receive censure rather than the department. Respect the opinions and welcome suggestions from the inspectors.

It is necessary for the chief to make occasional visits to the schools to watch the character of the work performed and to lend encouragement. These visits do not always show the true quality of an inspector's work, for he may put forward an extra effort for the occasion. Questioning the principals of schools as to the quality of the work is also bad policy and avails nothing. Few inspectors fail to stand well with the principals, and such questioning only leads the school authorities to doubt the efficiency of their visiting physician. When necessary, tactful investigations can be made without the knowledge of principal or doctor. The requisites which are set down for the chief also apply to his assistants.

Supervisors should occasionally compare work performed

and results obtained by each inspector under him, as well as those under other supervisors. This affords opportunity for fixing fair averages and correctly diagnosing shortcomings. The individual work of each inspector as to ability, quantity and accuracy can be studied by a reëxamination of part of a class by the supervisor. Censoring for minor errors or doubtful ones where one opinion may be equally correct as another is bad policy. Praise and commendation when deserved earns good returns.

Supervisors should have an intimate knowledge of the entire district and assignments in regard to social conditions, school population, distance between buildings, and cooperative tendencies of principals, teachers and parents.

Executive Ability and Office Control.—The chief sources of information which the head of the department has at his command, as to the work performed by each one under him, are the reports of his supervisors and the daily reports of each inspector. This shows how necessary it is to have a system that is simple and practical and not overloaded with numerous forms. The daily reports should tell him almost at a glance where something is going wrong. It is impossible for a chief to inspect the work of each man each day. He must depend on those under him, and if he is fortunate enough to have confidence in the work of a subordinate, it is well to show this trust. Encouragement and interest in the work can be given to the medical inspectors by occasionally calling on them to perform some special work which they may be individually interested in, and from which the department can benefit. A custom of going elsewhere for advice and suggestions regarding work which can equally as well be obtained from the employees of the department is poor policy. It disheartens the members of a corps, and tends toward routine and monotonous work that is detrimental.

Many of the present systems of medical inspection have a great variety of forms which add to the clerical work

and detract from the practical results. These systems, with their large number of blank reports, are subject to frequent changes by revision and additions, which tend to make confusion in the department. A glance in the office closets and store-rooms for discarded forms and literature is an index of efficiency. While simplicity and practicability should be the essential features in designing recording blanks, allowance must be made for gathering statistics of value. Good statistics based on actual work are necessary for the adjustment of activities. Good judgment and logic in evaluating statistics and reports is a valuable asset.

Among the various procedures of value in increasing the efficiency of a corps of inspectors and nurses, and improving the uniformity of the work, two things should receive emphasis. Each year practical talks should be given by supervisors and outside experts on subjects directly relating to medical supervision.

The work performed by each physician and nurse should be detailed on a general summary sheet to obtain averages for each endeavor and each defect found. To each inspector should be mailed a note with information "The average for the city is———." "Your average is————."

This information serves as a guide for the physician to endeavor to check or improve phases of his work.

BUREAUS OF CHILD HYGIENE.

Eight large cities in the United States have a Bureau of Child Hygiene as a part of their health department, and in three of these cities medical inspection of schools is one of the functions of the bureau. The work includes everything which pertains to the child from birth, and even prenatal conditions, until the child reaches the working age. Factors for the reduction of infant mortality, including supervision over midwives, maternities, baby farms, day nurseries and foundling institutions, are important features of the work.

Medical inspection of schools and the enforcement of laws relating to child labor, including the issuing of employment certificates, are performed by the same inspectors or a separate corps under the supervision of this bureau.

In Philadelphia the Division of Child Hygiene includes the care of the child to the time of entering school, and public school inspection is under the supervision of the Board of Education.

Philadelphia employs 82 medical inspectors, a chief of school medical inspection, and 9 supervisors, one having charge of nutrition work. The follow-up work is performed by 98 nurses under a head nurse responsible to the director of school inspection. There are 280 public schools with an enrollment of 250,000 elementary pupils, 40,000 high school and continuation pupils. The department of public school medical supervision is conjointly under the Bureau of Health and the Board of Education.

As the "School Code" failed to arrange for the inspection of the parochial schools, the Bureau of Health assigned these schools to the communicable disease inspectors in charge of the wards where such schools are located. This work is supervised by the assistant chief medical inspector.

Chicago has school inspection as a part of its Child Hygiene Bureau, and for its 400,000 pupils in both public and parochial schools employs 100 medical health officers or inspectors and 41 nurses. For administration purposes, 5 of these medical health officers are selected to supervise the other 95 without extra pay. Two of the nurses supervise the other 38. The city is divided into 95 districts, to each of which is assigned a medical officer.

New York City has a Division of Child Hygiene under the supervision of a director, who is responsible to the Commissioner of Health. The staff of the division for school inspection includes 87 medical inspectors, 8 supervisors, 211 nurses and 15 supervising nurses. The nursing staff is directed by a superintendent of nurses, who is respon-

sible to the chief of the division. In each borough there are 1 or more supervising nurses to superintend the work of the nurses detailed to that borough.

The functions of the division are educational and administrative. Its educational functions consist in teaching parents, particularly mothers, in the care of infants and children, and in the need of timely prevention and treatment of physical defects.

The administrative functions of Child Hygiene are:

1. The medical inspection of school children to detect the presence of contagious diseases, and the examination of the children to determine the presence of physical defects.

2. The enforcement of such laws of the State, such provisions of the "Sanitary Code," and such other regulations of the Board of Health as bear directly on the protection of the health of children of the community.

3. The supervision and regulation of the practice of midwives in the City of New York.

4. Through permits, the regulation of the conditions under which children are boarded out and the supervision of women engaged in the care of children.

5. The supervision of institutions harboring children and of day nurseries.

6. The issuance of employment certificates to children who have complied with the provisions of the child labor law, for the purpose of preventing the employment in factories or in mercantile establishments of children who are physically unfit to be so employed.

School Medical Inspection, New York.

1. School population: Public schools 817,621 pupils, 545 schools; parochial schools 153,806 pupils, 227 schools.

2. Appropriation for school inspection 1922–1923:—The appropriation for the Bureau of Child Hygiene is not segre-

gated by functions, so it is impossible to give an accurate estimate of the cost of school medical inspection service. For one thing, the large item of printing is not paid for by this department but is included in the budget of another city department—the Board of City Record—and we do not know how much this work costs. Again, the medical inspectors and nurses are called upon at various times to perform work not connected with their regular assignment and no provision is made for charging this borrowed service to the other lines of work. I might say that the budget of the Bureau of Child Hygiene for all activities covered (including personnel and supplies) is over $1,000,000 a year but I would not care to estimate how much of this is spent on school medical inspection alone.

3. Number of medical inspectors:—87 school medical inspectors; 8 supervising medical inspectors.

4. Number of nurses:—211 school nurses; 15 supervising nurses.

5. Number of clinics:—9 clinics for treatment of contagious eye diseases and refraction; 20 dental clinics.

CITY OF CHICAGO, 1922.

1. School population is approximately 600,000.

2. Number of school buildings:—approximately 600.

(These figures include public, parochial and private schools.)

3. Appropriation for school inspection in 1922 was about $165,000.00. The exact figures as to the appropriation for this type of service cannot be given for the reason that the budget provides funds for the expenditures of the entire bureaus, covering all classes of work.

4. The appropriation for school inspection in 1923 was about the same as that for 1922.

5. Number of medical inspectors:—120 on communicable diseases, 10 on diphtheria prevention work (paid for out of the corporate fund) and 50 on physical examinations and

smallpox vaccinations (paid for out of the Municipal Tuberculosis Sanitarium fund).

6. Number of supervisors:—21, 15 medical and 6 nursing.

7. Number of nurses:—Health Department 61, Municipal Tuberculosis Sanitarium 50.

8. Clinics under this Department, kind and number:—Dental clinics operating in 10 centers located in public schools, in charge of a staff of 4 dental surgeons, who work part time only (four hours per day). A dental clinic is conducted and located in each of the 8 Municipal Tuberculosis Sanitarium Dispensaries; all these clinics are open to school children.

SCHOOL NURSE.

In many cities where physicians were employed to perform the school inspections, innumerable defects were recorded, but only a small percentage received treatment. This was due to indifference or ignorance on the part of parents, who did not realize the importance of the recommendations, and to the inability of the physician to spare the time to personally explain to them the dangers of certain diseases. It was evident that some connecting link was necessary between the doctor and the parents, the school, and the home. The school nurse has filled this gap in medical inspection.

In the early days of school inspection, the duty of the physician was to detect contagious diseases and exclude all such cases. No distinction was made between the major infections, such as scarlet fever and diphtheria, and the minor contagious skin diseases, impetigo and ringworm. Children afflicted with any disease known to the medical profession as contagious or communicable were excluded until cured, and often remained from school longer than the illness warranted, due to failure to obtain medical advice and treatment. Many pupils were thus deprived of schooling when a few treatments at school would

have made it safe for them to remain in the class-room. The system not only deprived the child of valuable hours of teaching, but tended to make truants of those with a weakness in that direction.

With the progress of school inspection came the examination for physical defects which might interfere with the progress of the child. Many defects were found and many written recommendations were sent to parents, only to receive scant attention. Although records and reports were plentiful, results were not forthcoming.

Poverty, indifference, and ignorance were causes assigned for the failure to obtain treatment for the defects found by the school physicians. It was evident to those in authority that to obtain results some auxiliary to school inspection was needed. The trained school nurse with her "follow-up" system was the solution of the problem. Her work has steadily grown, and become systematized, and today it is conceded that school nursing is one of the most important parts of the work of medical inspection. The thousands of cases in the care of nurses can be accurately determined, but there is no way to estimate the benefits to the school and the child, the suffering alleviated, the number of children brought to a condition in which they receive the full benefits of school instruction, or the number of lives saved.

Number Required and Appointment.—Most school physicians are employed to perform a certain amount of work, and while in some cities a specified number of hours is assigned, rarely the entire working day is required. School nurses, on the other hand, must work the entire day and six days per week. The working day includes the five school hours, some of the noon recess, and also time after school. The greater amount of time allotted to her work does not permit a nurse to attend a greater number of pupils than the school doctor. Three thousand pupils is a fair average to apportion to one nurse. This number of pupils will require her entire time, and will not permit any outside

or additional work, such as teaching mothers the care of infants or supervising milk depots. In cities where nurses must perform other duties, it is advisable to assign a nurse to each inspector or one to a district.

The appointment of nurses depends upon which municipal department has control of school inspection. If a city employs only a few nurses, paid by the educational authorities, the selection may be made by the superintendent of schools, the board of education, or its committee on elementary schools. Where the health department has the supervision, the appointment is made by the director or the health officer. It is inadvisable to have the supervision of nurses and of physicians under different departments, as it admits of lack of coöperation and probable friction.

In cities employing a large corps of nurses, and where not specified by law, considerable annoyance and responsibility can be saved for the appointing power by utilizing eligible lists from civil service examinations. To obtain the most efficient help through such examinations, the questions must be practical and pertaining to the duties of the position. The averages, however, must not be based solely on the answers; due credit should be given for previous experience and training, as well as for judgment, tact, and personality judged by personal interviews.

Where civil service lists are not used, the person who makes the appointments may profit by considering the opinions of the chief or supervisor who is directly responsible for the work of the department. In all appointments the head nurse should have previously interviewed the applicants.

When more than five nurses are employed, it is advisable to have a supervising nurse who should outline and superintend the work. She should be responsible for those under her and report to the chief inspector, and should preferably have served as a school nurse. Supervising nurses are valuable additions to assure success.

Qualifications.—A school nurse should be a graduate of a reputable training school and should have had one or two years of private work. Experience gained in visiting nursing is also of great advantage. Preference should be shown the nurse who seems to be interested in work of this character. School nursing requires gentleness, yet firmness, tact, perseverence, and resourcefulness. An efficient nurse is willing to be supervised and does not oppose criticism of her work. This quality is acquired by a good hospital training. The character and temperament of the applicant as well as her physical health should receive serious consideration. A thorough physical examination should be required of all applicants for the position and cases eliminated where ill health is likely to result in repeated absence from work.

A knowledge of a foreign language, especially Italian, Russian, or German, greatly aids in obtaining results among foreigners. Conversing in their native language wins the confidence of parents unable to speak or understand English, and is a distinct advantage over the use of an interpreter.

One occasionally meets a nurse who adversely criticises the work of the physician or the teacher. This unfortunate trait or acquired habit, creates disloyalty and antagonism. While this assertion may seem unnecessary, the author knows of several instances in which such actions have been the undoing of an otherwise efficient nurse.

Duties of School Nurses.—Where a nurse conducts the medical inspection in lieu of a doctor, she examines the vision and hearing of the pupils, recognizes signs and symptoms suspicious of contagion or physical defects, and refers the cases to a dispensary or physician for confirmation of her diagnosis. Upon the recommendations of physicians she urges parents to have defects treated. She also combats uncleanliness and aids in the teaching of hygiene.

Nurses working in conjunction with physicians in school

inspection are assistants to the physicians, aiding them in the physical examinations and procuring treatment for defects found. In class examinations, with the assistance of the teachers, she designates the pupils who should receive an early inspection by the physician.

After diagnosis by the physician, the nurse takes full charge of the case and uses all available methods to have the parents obtain treatment. By home visits and school consultations she establishes a better understanding and closer coöperation between the school and the home.

The function of the school nurse acting in the capacity of a social educator on public hygiene is of great importance.

Equipment of Nurses.—The school nurse should wear a regulation outfit, one which will at all times distinguish her in her work. A neat, plain, dark blue or gray dress made of linen, chambrey, or of other washable material is best. This uniform is of equal value, and serves the same purpose as a badge, assuring her entrance to the homes. She becomes known by her uniform, which even affords her protection when working in the tenderloin districts.

Nurses in uniform have gone with perfect immunity in neighborhoods where men would fear to enter. Here they have not only been welcomed, but notorious characters have led them to residences they were seeking.

In a few cities a special bag is provided for the nurses. These bags should not be too cumbersome, but large enough to hold a few drug supplies, instruments and record cards. She should have a clinical thermometer, bandage, scissors, wooden tongue depressors, and applicators or toothpicks, medicine or eye-droppers, absorbent cotton, adhesive plaster and safety pins. A few drugs should be carried in the bag, including aromatic spirits of ammonia, alcohol, tincture of iodine, tincture of green soap, bichloride of mercury tablets and lysol.

Drugs should be placed in 1- or 2-ounce vials and

plainly labelled. All poisons should bear a conspicuous "poison" label. Cotton, bandages and gauze should be kept in a tin box. These bags should be frequently inspected for cleanliness and replenishing. Where there is a supervising nurse, inspections of outfits should be made at regular intervals.

FIG. 1.—Nurse's outfit in school.

At each school the nurse should have a closet in which to keep supplies, record cards and literature. These closets should contain the things described under the medical inspector's outfit, be kept locked and the key remain in the principal's office.

Methods of Work.—The work of the school nurse is performed in the schools, at homes, and in dispensaries. She

should visit daily every school under her care, beginning with the first school soon after the opening exercises. Nurses as well as physicians should have a fixed schedule of visits for each day. A copy of such schedule should be filed at the central office and a copy in each school assigned. These schedules make it possible to locate physician or nurse when needed. Daily time reports should be rendered by all employees, preferably at end of each week. These should state places visited, time of arrival and departure. When there is an unavoidable absence, lateness or change of schedule, the central office should be so notified. In her box containing the record cards there should be two separate compartments, (1) containing new cases, and (2) cases under treatment. The nurse should go to the principal's office, announcing her presence and receive the cards of patients referred to her by the physician at his previous visit. She should then send for these children, taking usually one, but not more than two or three from the class-room at a time, and treat or instruct each case in a room set aside for her work. When finished with a child, another case is sent for, using the child just leaving as a messenger, and so proceed until all the new cases are disposed of. Then the cases under treatment that need attention that day are sent for. The same system in sending for the children applies with these cases, and the work should be planned so as to finish with the pupils of one class-room before taking up the next. This creates less confusion and annoyance to the teachers.

If a child is to receive instruction regarding uncleanliness of head or body, such instruction should not be given before another child, unless there are a number of pupils requiring the same instructions. When preparing a printed circular of instructions to be carried home to parents, the nurse should fold the circular and place in an envelope, thereby respecting the feelings of the child.

If a parent's attention is to be called to an existing defect,

one of the following forms has already been sent home with the child by the inspector.

Mr.....

Dear Sir:—This is to notify you that

....., a pupil in the .....School, is in need of medical attention for .....

..... Your are advised to consult a physician, hospital, or dispensary without delay.

Very truly yours,

Philadelphia,.....19..... .....

Medical Inspector.

There is no advantage in having separate notification blanks for the various defects. If this simple form does not arouse the interest of a parent to the point of action, other steps must be taken.

Before resorting to a visit to the home, the nurse should send by the child a request for the parent to come to the school. These visits are termed "school consultations." A parent may be notified to call at the school in the interest of the child, and a time set which is convenient to the nurse, by using the following form. The card should not specify any particular disease, and should be signed by or with the name of the principal of the school. A request from the principal will bring a quicker response than from the physician or nurse.

.....School District, No.....192....

Mrs.....

Dear Madam:—Your child, ..., has been found by the medical inspector to be suffering from defects which greatly interfere with $\begin{matrix}\text{his}\\\text{her}\end{matrix}$ work at school.

Kindly call at the school on.....at.....o'clock, in order that we may explain to you what can be done to help $\begin{matrix}\text{her.}\\\text{him.}\end{matrix}$ *This is very Important.*

.....

Principal.

At school consultations, the nurse should be tactful in her manner of informing parents of the existence of certain defects in the child. Little is accomplished by exaggerating the dangers from an unattended disease; it not only frightens the parent, but if the physician to whom the child is eventually taken belittles the physical ailment, the parent loses confidence in the nurse and school inspector. Instead of saying a child is backward due to a physical defect, the nurse should emphasize the fact that the child may learn more readily and with less exertion if the defect were corrected. Most parents resent being told that their children are mentally dull. It is also advisable not to use medical and other scientific terms in explaining the illness of the child. Such terms are not generally understood by the public, and, by confusing them, tend to defeat the purposes of the consultation. The nurse should avoid arguments regarding a diagnosis, as these also tend to jeopardize any favorable impressions that may have been made. If the parent seems refractory and unwilling to act upon suggestions, the teacher or principal may be called upon to aid in accomplishing the object of the visit.

Should the parent neglect to call at the appointed time, the nurse should not censure the child or send threatening communications to its home. The proper way is to learn the reason for the parent's absence. A mother may have been detained by the care of an infant or other home duties, or the time appointed may have been inconvenient. If the child's excuse for the parent warrants, list the case for a visit to the home, unless assurance of results from a second request. There are few cases, where the parent calls at the school to inquire what is desired, which fail to receive prompt attention.

A parent may be willing to have the child treated, but pleads lack of funds to pay for services and lack of time to spend at dispensaries. In such cases the nurse should offer her services and request the parent to sign a card granting

her permission to obtain any necessary treatment. The accompanying blank is for this purpose:

To the Principal,

.....*School:*

I hereby authorize the School Nurse to take my child

.....

to an institution to have $\frac{\text{her}}{\text{his}}$ physical defects properly treated.

.....

Parent's Signature.

Date.....

Residence.

This authorization in writing relieves the nurse from any responsibility or blame for proceeding to have the child treated, and protects her in case a parent should deny having given permission.

Even with one of these permits properly signed, the nurse should never consent to any operation at a hospital without again consulting and obtaining the written consent of the parent.

The nurse should always encourage the consultation with the regular physician of the family, and only upon evidence of poverty should dispensaries or school clinics be advised. Parents desiring to avail themselves of the services of a dispensary should be told by the nurse the location of the nearest one and the clinic hours for the disease to be treated. She should arrange one or two afternoons each week to take cases to the dispensaries and school clinics.

After disposing of all the old and new cases, and time permits, the nurse may make a preliminary inspection of the pupils in one or more class-rooms. Where there is no physician to perform class-room inspections, the nurse may utilize these opportunities to discover children with physical defects, but where her work supplements that of the physician, she should select a class not recently examined by the

physician and adopt the following procedure: Without disturbing the exercises she should walk slowly up and down each aisle, observing each child for cleanliness or eruptions on skin, suspicious of contagion. Having noted the names of the children, those requiring immediate attention are sent for and the others are called at the next visit.

The nurse should divide her morning hours so as to allow a stated period of time to each school. When one of these periods is completed she should proceed to the next school on her route and perform the work in the manner outlined above.

A certain number of visits to homes are needed to make the work effective. These visits are made after school hours and on Saturdays, unless there are many visits, when part of the afternoon session can be used for this purpose. At the homes the nurse should observe the building and social conditions, and should suggest remedies for insanitary conditions where needed. In this way the nurse becomes the social visitor and should acquaint herself, where possible, with existing poverty. She should be able to decide when a case is worthy of free medical services, also when glasses should be furnished free by the city. It is necessary at times to devise ways and means for obtaining a brace, a high shoe, or other appliances to correct a deformity. In order to be of most help in such cases, the nurse and the central office should know all of the charity agencies and what functions they perform. Coöperation with available organizations is a great aid in the work.

It is impossible to give the details of procedure for each of the many circumstances that may arise, but a resourceful nurse always finds the remedy. The experiences of most school nurses have shown that opposition is the exception, not the rule.

To gain the confidence and friendship of the mothers is the key to success, and many seemingly hopeless cases have yielded to persuasion and kindness.

The following cases are not treated at school, and should be excluded:

1. Contagious eye diseases with symptoms of acute inflammation or discharge.
2. Contagious skin diseases with extensive lesions.
3. Pediculosis with live pediculi.

The following cases are allowed to attend school while under treatment by a private physician, dispensary, or school nurse:

1. Acute conjunctivitis without discharge.
2. Pediculosis with nits but no live pediculi.
3. Skin diseases including ringworm of scalp, face, or body when properly protected against infecting others; scabies (if gloves are worn); simple impetigo.
4. Trachoma if there exists no acute inflammation or discharge, and the case is under constant treatment. Cases of trachoma should not be treated at school.

The nurse should adopt the following methods of treatment at school:

Pediculosis: The child is given a circular containing printed instructions, and he is to report to the nurse on the following day, when she can readily see if the instructions were carried out.

Instructions to Parents on the Care of Children's Hair and Scalp.

Children affected with vermin of the head are excluded from school. The following directions will cure the condition:

Mix ½ pint of sweet oil and ½ pint of kerosene oil. Shake the mixture well and saturate the hair with the mixture.

Then wrap the head in a large bath towel or rubber cap so that the head is entirely covered; the head must remain covered from six to eight hours.

(Tincture of larkspur may be used instead of oil mixture. The directions for use are the same.)

After removing the towel, the head should be shampooed as follows:

To 2 quarts of warm water add 1 teaspoonful of sodium carbonate. Wet the hair with this solution and then apply castile soap and rub the head thoroughly about ten minutes. Wash the soap out of the hair with repeated washing of clear warm water. Dry the hair thoroughly.

Nits: If the head is shampooed regularly each week, as above described, it will cure and prevent the condition of nits.

Impetigo: Remove crusts and clean parts with tincture of green soap and apply ammoniated mercury ointment or an ointment of zinc oxide.

Ringworm of face or body: Clean with tincture of green soap and apply collodion or tincture of iodine.

Ringworm of scalp: Clean with tincture of green soap and apply an ointment containing tar.

Conjunctivitis: Instillations of a solution of boric acid—10 grains to 1 ounce of distilled water. If there is any mucopurulent discharge instil 1 drop of a 25 per cent argyrol solution.

Blepharitis: Rub on eyelashes an ointment of yellow oxide of mercury, 2 grains to 1 ounce.

Scabies: Should not be treated at school, but parents should be shown how to properly apply sulphur ointment. Three applications on successive nights at bedtime is sufficient. All clothing and bedclothing must be thoroughly boiled to prevent reinfection.

Wounds: Thoroughly cleansed with a bichloride or other antiseptic solution and a dry sterile dressing applied.

Emergency cases should be treated as the occasion requires, and if serious the child should immediately be sent home. Vomiting should suspicion scarlet fever or other infection. All cases suspicious of contagion (acute infectious diseases) should be immediately reported to the inspector of contagious diseases.

The Value of School Nurses.—The need of trained nurses for school inspection has become apparent in most cities where physicians alone are employed. Records and statistics, wherever the system has been tried, show the effectiveness of the nurse in obtaining treatments and results. It has proved vastly superior to the many methods in use previous to the employment of school nurses, and has brought about a spirit of coöperation on the part of parents, much more effectively than the old practice of written notices

TABLE IV.—CITY OF CHICAGO.—FIELD NURSES' SCHOOL WORK, 1919—1921, INCLUSIVE.

	1919.	1920.	1921.
Average number of nurses working	102	88	88
Total number of schools visited	65,693	53,237	56,467
Average number of supervising nurses	6	5	5
Average number of field nurses	82	4	4
Public schools	49,837		
Parochial schools	15,856		
Pupils inspected	516,692	453,340	510,089
Routine inspections number	432,745	333,386	324,123
Pupils needing attention	222,244	178,264	169,084
Pediculosis	59,058	31,987	37,213
Dental	117,209	147,679	146,056
Suspect contagious diseases	5,318	2,117	1,758
Inspection for vaccinal status	181,370	97,498	242,894
Assisted in vaccinating children	89,450	46,064	132,331
Physicals assisted	67,569	32,873	35,967
Cultures assisted	7,533	4,897	3,060
School dressings total	24,929	27,319	24,172
Children referred to health officer	44,512	36,247	33,874
Cultures	791	...	749
Emergency cases	10,370		
Impetigo dressings	3,157	...	24,172
Sessions of Little Mothers' Clubs	1,013	886	1,786
Number of children attending	19,961	20,763	44,875
Miscellaneous calls	23,364	17,548	19,582
Dispensary	6,985		
Private physicians	73		
Dentists	2,544		
Opticians	867		
Charity and County Agent	69		
Juvenile court	23		
Child Study Department	120		
Others	12,683		

and exclusions. Conflict and misunderstanding between the physician, school and home has been replaced by confidence.

Repeated suggestions have been made to enact a law which would provide a penalty for failure of a parent to obtain necessary treatment upon the recommendation of the school physician. However, should such laws be enacted, it is questionable whether they would not be declared unconstitutional. Where an efficient system of school nurses has been established, the results will be equivalent to those which could be expected under possible legislative enactment. History proves that laws are not the "cure-alls" to all shortcomings and needs, and less faith should be placed in their action. This is not surprising, for often persuasion and

TABLE V.—WORK OF FIELD NURSES—PHYSICAL DEFECTS—1921.

	Under care first of year.	Under care during year.	Corrections obtained during year.	Dropped during year.	Remaining undercare end of year.
Malnutrition	5,342	1,785	466	4,813	1,848
Anemia	6,043	1,868	500	4,799	2,612
Enlarged lymph glands	10,872	2,024	455	9,140	3,301
Enlarged thyroid	1,826	429	47	1,591	617
Nervous diseases	705	317	58	687	277
Cardiac diseases	690	181	10	658	203
Defective speech	506	170	31	446	199
Suspect tuberculosis	4,814	1,818	542	4,406	1,684
Other pulmonary diseases	196	59	30	142	83
Skin diseases	952	1,655	1,522	853	232
Rachitic type	316	52	4	294	70
Other orthopedic diseases	592	167	27	469	263
Vision defective	11,340	6,571	4,647	8,518	4,746
Other diseases of the eye	1,932	1,175	672	1,755	680
Hearing defective	1,361	651	131	1,141	740
Ears discharging	965	606	211	1,014	346
Nasal breathing	3,008	674	352	2,600	730
Palate defective	420	39	3	374	82
Teeth defective	53,162	14,057	8,660	44,230	14,329
Hypertrophied tonsils	30,169	7,019	3,329	23,150	10,709
Adenoids	13,298	3,794	2,295	10,005	4,792
Mentality defective	517	103	18	487	115
Pediculosis	14,186	12,752	7,954	18,444	540
Unclassified	558	253	129	623	59
Total	163,770	58,219	32,093	140,639	49,257

reasoning succeed in accomplishing things which the laws cannot. In the author's opinion, any legislature which will make it mandatory for cities to employ both physicians

TABLE VI.—CITY OF PHILADELPHIA, 1922.—SUMMARY OF WORK OF SCHOOL NURSES, SHOWING CHARACTER OF NURSES' SERVICES.

	Advice at		Local treatment.	Taken to dispensary.
	School.	Home.		
Eye strain	943	1193	1036	4,544
Nose and throat:				
Hypertrophied tonsils, Nasal obstruction	2880	3275	2	3,970
Nasal catarrh, Miscellaneous	61	73	20	50
Ear:				
Defective hearing	17	47	4	48
Otorrhea	33	37	3	51
Miscellaneous	6	7	1	11
Dental caries	2224	2383	132	12,633
Orthopedic:				
Stoop shoulders and flat chest	92	99	4	6
Scoliosis	17	20	...	15
Miscellaneous	16	61	1	48
Speech defect	52	61	...	40
Malnutrition	494	508	...	68
Miscellaneous	142	258	4	191
Total important defects	6977	8022	1207	21,675
Skin:				
Pediculosis	147	161	5	
Ringworm	9	47	1386	1
Other contagious skin diseases	6	21	251	1
Eczema	15	23	92	4
Impetigo and pustular dermatitis, Non-pustular dermatitis, Other non-contagious skin diseases, Miscellaneous	15	28	638	40
Minor eye diseases	35	64	63	63
Total minor defects	227	344	2435	109
Total all defects	7204	8366	3642	21,784

and nurses for the schools, will save itself the need of any further legislation on this and many other subjects pertaining to public health.

The school nurse has opened a path to the development of an ideal system of betterment of public health in our cities. The school nurse of the future will be the municipal nurse, whose duties will include not only protecting the health of the school children, but also caring for infants, teaching mothers their hygiene and proper feeding, thereby reducing a great and unnecessary mortality. By improving housing and living conditions, she will reduce the mortality from tuberculosis, pneumonia, and other preventable diseases. She will be the supervisor of health and sanitation in the factories as well as a teacher of hygiene to the children at school and to their parents at home. She will be the connecting link between the destitute family and the numer-

TABLE VII.—PROPORTION OF PHYSICAL DEFECTS CORRECTED. September 1, 1921, to June 30, 1922.

Physical defects.	Number of cases recommended for treatment.	Number of cases treated.	Cases treated, per cent.
Eye strain	21,586	8,567	30.4
Hypertrophied tonsils and adenoids:			
Treated with operation 6,347			13.0
Treated without operation 5,327			10.9
Total treated 11,674	48,674	11,674	23.9
Ear defects	2,047	1,473	71.9
Decayed teeth	115,664	50,295	43.4
Orthopedic defects	10,267	8,139	79.2
Poor nutrition	12,345	9,391	76.0
Miscellaneous important defects	4,706	2,902	61.6
Total important defects	215,289	92,441	42.9
Minor eye defects	3,577	3,068	85.7
Contagious skin diseases (minor)	13,314	12,380	92.9
Non-contagious skin diseases	4,385	4,184	95.4
Miscellaneous minor defects	9,601	8,703	90.6
Total minor defects	30,877	28,335	91.7
Grand total	246,166	120,776	49.1

ous organizations dispensing aid. With a small district assigned to a nurse in which she is held responsible for the health of every person and sanitation of every house, results can be obtained which would be impossible by any other system. The school nurses of the future are destined to be the guardians of our public health.

The true and ultimate objects of medical inspection of schools are safeguarding the health of the pupils and improving their physical and mental condition by removing those defects that interfere with the child obtaining a normal education with comfort. Medical inspection without nurses is largely one of records and statistics, while with nurses it means action taken and results obtained. No amount of talk can give more convincing proof of the absolute value of school nurses than the reports shown on pages 60, 61, 62 and 63 of the work performed by nurses in several large cities.

COMPULSORY TREATMENT.

There is sharp division between English and American opinion generally on the wisdom and soundness of policy in the legal compulsion of parents to provide for their children such curative treatment as may be necessary for the correction of discovered physical defects. The English authorities are not only well armed with specific laws for this purpose, but they already have in their favor a number of judicial decisions. The record of legal prosecutions and compulsion, even punishment of recalcitrant parents and guardians, already contains precedents regarding almost every kind of children's physical deficiency requiring surgical, medical, or nursing service.

In a number of our States it is possible at the present time to proceed against recalcitrant parents and guardians in such cases under certain provisions of the compulsory education law, sanitary codes, or domestic-relation laws affecting the relations between parents, guardians, and children; but

direct provisions of this character are only to be found in the laws of Colorado, New Jersey and New York.

The law of Colorado, passed in 1909, contains the following:

If the parent or guardian of such child shall fail, neglect, or refuse to have such examination made and treatment begun within a reasonable time after such notice has been given, the said principal or superintendent shall notify the State Bureau of Child and Animal Protection of the fact: *Providing, however,* That whenever it shall be made to appear to the said principal or superintendent, upon the written statement of the parent or guardian of said child, that such parent or guardian has not the necessary funds wherewith to pay the expenses of such examination and treatment, the said principal or superintendent shall cause such examination and treatment to be made by the county physician of the district wherein said child resides; and it shall be the duty of such county physician to make such examination and treatment, and if he be unable to properly treat such child he shall forthwith report such fact to the county commissioners of the county with his recommendation.

The New Jersey law, adopted in the same year as the one in Colorado, contains the following provision:

If the cause for exclusion is such that it can be remedied, and the parent, guardian, or other person having control of the child excluded as aforesaid shall fail or neglect within a reasonable time to have the cause for such exclusion removed, such parent, guardian, or other person shall be proceeded against, and, upon conviction, be punishable as a disorderly person.

In the State of New York it is possible to take action against neglectful parents both under the penal law and the educational law. The penal law provides that a person who willfully omits, without legal excuse, to perform a duty by law imposed upon him to furnish food, clothing, shelter, or medical attendance to a minor is guilty of a misdemeanor. At the same time, the State education law provides that

every child of the statutory age, who is in proper physical and mental condition, shall attend school. Under such law, it is possible to take action against recalcitrant parents. No doubt such action could be taken in a number of States having compulsory education laws. It should be pointed out, however, that resort to such legal action is almost futile, if no penalties are provided.

So far there is on record only one report of a prosecution and conviction in a case of this character. The State Superintendent of Public Instruction of Colorado, in her report for 1909–10, page 16, says:

Out of 41,546 cases of defectiveness reported to the State Superintendent of Public Instruction as having been discovered, and presumably reported to the parents of the children, 221 cases were reported by teachers to the State Bureau of Child and Animal Protection for failure of parents to have the medical examination, indicated by the teachers' examination, made.

The report goes on to say that—

With 1 exception the parents in all these cases induced by letter or by the visit of our officer to do whatever the children's condition required. In the 1 case where it was necessary to bring the parents into court the child's throat was nearly closed by enlarged tonsils and his health seriously affected. At the trial the father was sentenced to thirty days' imprisonment.

It is obvious that failure to correct visual defect could be prosecuted on the same grounds.

American Opinion.—The opinions of American workers in the field of school health is shown by the following from Dr. Jacob Sobel, chief for the Borough of Manhattan, Division of Child Hygiene, New York City Health Department, who has given particular attention to the attitude of the parents, especially in the foreign quarters of the metropolis, toward the exercise of official compulsion in the removal of physical

defects. Referring to conditions in New York, Dr. Sobel, says:

So serious at one time did this question of parental coöperation become that it was suggested that legislation be enacted to compel parents to have these physical defects remedied. It is questionable whether any such compulsory law will be enacted in our day, any that will stand the test of the courts, and I admire the courage of those who advocate the idea. With Kerley I prefer to say, "I do not believe in compulsion or in attempt at legislating righteousness into people. I do believe in education sufficient so that each individual may with reason and intelligence direct his life and habits." The easier way, that of education, I believe to be along the line of least resistance; "accomplishing mighty feats by gentle suasion" will prove, in the long run, not only more effectual but more lasting.

SYSTEMS OF INSPECTION.

Systems of medical supervision are as numerous and varied as the number of cities offering such services. The complexity of the systems of administration are partly dependent on the kind and extent of duties performed. There are many similar features in most of the cities, with an endeavor to accomplish their object with certain variations made necessary by number and kind of examiners, amount of money to be expended, and extent of authority granted.

Some cities have not progressed beyond the pioneer stage of only guarding against contagion; others have added a cursory examination of eyes and ears; and a few adopt every phase and innovation related to the medical side of pedagogy.

By acts of legislatures some cities and states are permitted to only prevent the spread of communicable diseases, and therefore are prevented from performing a most important function of preventing and eliminating physical defects

which seriously handicap the child's education. In some cases the appropriations are too small to adequately carry on any real system.

There are cases where even with available funds, poor administration lessens the results obtainable. The author desires to call attention to some faults of administration: Incompetent inspectors with little interest or enthusiasm for the work; lack of training after appointment; too few doctors and nurses; allotment of territory or assignments faulty; excess of clerical work; endeavor to pile up statistics more than accomplish results; money wasted on fads; too much time given to trifling defects to the detriment of major ones; lack of uniformity in work in different parts of the same city; teachers failing to coöperate with inspectors and nurses.

In alloting assignment to inspectors and nurses, consideration should be given to the distances between schools, as well as kind and not number of population in a district. A nurse or doctor can attend to more schools in a section of a city inhabited by the higher social classes than the doctor who attends the schools among the congested and foreign element. In some schools the physician may see no more than a half dozen patients a month, whereas in the district of poorer people each school may send daily from 20 to 50 patients. School population is not a safe guide by which to allot the work. Sometimes a small annex with 100 children takes as much time to inspect as a school of 1000 pupils.

Through a lack of understanding of the duties of the doctor and nurse, in some schools there is a waste of valuable time disposing of trifling wounds, etc., when the same time could be used for more important examinations. There is no need of a teacher sending to the inspector the same child with the same ailment each day, and the nurse should judge when she desires the doctor to again see the patient.

The laws of various states specify how often each school child shall receive a physical examination. This varies

from three times a year to once a year, and in some cases once in three years. The question of how often a child should be examined should not be specified in acts of legislature. It should be mandatory to examine and the frequency left to the individual educational authorities. Large numbers may look well in statistical tables but mean little in a true calculation of results. The author is of the opinion that an ideal system should require a thorough physical examination before a pupil is enrolled. This would offer an opportunity of compelling parents to correct major defects before enrolling, instead of begging and pleading as is now often the case. Instead of the physicians examining and reëxamining many normal pupils each year, they could direct greater efforts and time to having defects corrected and keeping the schools free from contagion. All children absent for illness over a stated period should again receive a physical examination.

A second examination to all pupils should be given on entering grammar school and a third on entering the higher schools.

Proof that the plan of examinations before enrollment is practical is shown in those states having compulsory vaccination, where no trouble ensues from having the child vaccinated before it can come to school. There are defects which would endanger a child in school life equally as much as the risk of smallpox, and equal demands should be made from the parent.

In outlining a system of procedure in school examinations, to submit to the person seeking information, a myriad of forms and instructions as are found and used in the hundreds of cities or even a dozen prominent places, would only tend to confuse, instead of aiding one in a decision. The author prefers to submit a rational, practical system based on an intimate study of those in existence.

In considering the adoption of a system one must be mindful of the duties of the inspectors, which should embrace:

1. The detection of contagious diseases, thereby protecting the child and the community.

2. The detection of physical defects, which may prevent the child from acquiring an education, and the correction of these defects which may add to his physical and mental development.

3. To find the capacity of the individual child to acquire knowledge in accordance with his mental and physical status.

4. To insure the best possible hygienic surroundings for the child while he is in the charge of the school.

5. To bring a closer relationship between the school and the home; to carry out more successfully the other aims of medical inspection and assure treatment for defects.

6. To teach hygiene and healthful living that may be practised at school and home.

7. To examine the child about to leave school and go to work for assurance of his or her physical fitness to bear the added burden.

8. To examine prospective applicants for teaching and eliminate those physically unfit; also periodically examine those in the service, and teach to them such rules of hygiene which they should both observe and teach.

9. To examine janitors, engineers and other employees to protect the organization against semi-invalidism or loss of time and services.

10. To study all children of school age in or out of school who are physically handicapped to an unusual degree and decide how to offer each some education.

To accomplish all of the above objects of medical inspection, trained physicians should be employed. The examinations made exclusively by nurses or untrained and uninterested inspectors are often incomplete, inaccurate, and of slight value, and little information is secured that is of use to the teacher in the education of the child.

Where the physicians are required to attend both morning

and afternoon sessions, the morning may be employed in examining cases of suspected disease and defects found by teachers and nurses, and the afternoon utilized for complete physical examinations of the pupils. This should progress with sufficient rapidity, so that every child shall receive such an examination at least once a year.

Class-room examinations of all the pupils are necessary after finding a case of contagion. These examinations are also of value in making a preliminary survey of the defects existing in a school.

FIG. 2.—Class-room inspection.

Class-room inspections are conducted as follows: The physician stands with his back toward a window and the pupils pass in front of him in single file. At his side are the nurse and teacher of the class. Each child as it approaches the physician with outstretched hands and head elevated to give a full view of face, turns hands to show both sides. The physician quickly observes the face for eruptions, sore eyes, discharge from ears or nose, enlarged glands, etc.

The child is instructed to open mouth wide and say, "Ah! Ah!" This gives a fair view of the throat for condition of tonsils and uvula and also condition of teeth. Hands

are inspected for peeling or eruptions. While the doctor is busy with these observations, the nurse glances at hair and scalp for vermin and observes the condition as to general cleanliness.

The teacher, supplied with paper and pencil, notes the name of any child to whom the doctor calls attention and places after the name a number given by the physician. These numbers represent a code easily remembered by the physician.

1. Head and scalp.
2. Eyes.
3. Nose.
4. Throat.
5. Ears.
6. Skin.
7. Uncleanliness.

X. Special, meaning an important case requiring immediate attention, such as a suspicious contagious disease.

The physician collects these lists as he leaves the class-room, and upon returning to the room set apart for his examinations sends for these cases, several at a time, and makes a more thorough examination to confirm the diagnosis, and gives instructions.

This system is employed in a number of cities, and its effectiveness depends upon the skill of the physician in quick and accurate observations. No two men would obtain the same results with the same pupils, and the method is useless for final diagnosis. Children with suspected ailments must be noted or taken out of line and given a more thorough inspection.

In communities where they depend upon teachers to send to the inspector cases they believe require the attention of the physician, there is the disadvantage of relying upon individuals with inexperience and limited knowledge in detecting cases. One teacher may send great numbers of cases that are unimportant and cause needless waste of the physician's time; while others may send none, often overlooking children suffering from communicable diseases or gross physical defects.

Physical examinations, or what are termed in some cities, "individual examinations," are conducted for the purpose of detecting any variations from the normal that may interfere with the health, growth and development of the child. Some cities have laws or rules which forbid the physician touching the child during an examination. This is absurd in many respects, as medical authorities know the impossibility of detecting conditions of nose and throat, eye diseases, such as trachoma, chest diseases, such as tuberculosis, or defects of heart, without touching the child. Some authorities contend that the duties of the physician are only preliminary to a more accurate diagnosis by family physician or dispensary. This may be true, nevertheless it results in the recommendation of many cases for examination which later prove normal. Furthermore, these mistakes, due to snapshot diagnosis, often cause ill-feeling with parents, and also give to parent, teacher, and attending physician the erroneous impression that the medical inspector knows very little about medicine. It lessens the confidence in the school physician and is detrimental to the reputation of municipal work.

Cities vary in the frequency of visits required of their inspectors; some stipulate daily visits, while others twice a week or weekly. This question should be governed by the class of school population. The need of daily inspection or visits depends upon the number of cases referred to a physician in each school. In the same city those schools that care for children of the foreign population and tenement district should be visited daily, while those in better sections may require but two or three visits per week.

In estimating the work performed by medical inspectors, the amount of time spent, the number of schools visited, or the number of pupils seen is no criterion. Great distance between schools may mean that the major part of time is spent in travel. One inspector may accomplish more in one hour, due to better training and ability, than another

in three hours. Great numbers of pupils examined and few defects discovered and remedied mean little progress to the work.

Mode of Procedure.—At the beginning of school term in September and in February, the inspector should pass judgment on vaccinations of all applicants for admission, and should vaccinate those who fail to show a successful mark and are too poor to pay for such services. Accepted evidence of vaccination or previous smallpox should be recorded on the permanent registration cards.

Complete physical examinations should be begun as soon as possible. Each child should be taken to a room set aside for such purpose. This class of examinations should be performed at the last school visited on that day's schedule, and after all other duties are performed.

Physicians and nurses should record time of arrival and departure in the same time-book as teachers and other employees. Upon entering schools they should announce their presence by first going to the office, and announce to each class-room by a signal on the school's bell system or by some other method where bell does not exist. Inquiries should be made from clerk or principal as to receipt of any notification of communicable diseases, and proper action taken accordingly. All cases sent to the doctor should next be disposed of and proper records made. The inspector then proceeds to the next school on his daily schedule, performing the same duties. At the last school, the remaining part of the session is devoted to complete physical examinations.

Physical examinations is a variable term in many cities or towns. It may mean a cursory examination of vision before a test card and ability to hear a watch or spoken voice, or it may embrace everything required by an insurance company. Details of methods of procedure in making a complete examination are outlined in Part IV, Physical Defects.

Shortly after school convenes in the fall, the inspector should make a survey of the sanitary conditions of the

building and grounds and return to the office, on the record forms, all desired information. The details of procedure in making such a survey will be found in Part II, The School Buildings and Grounds.

The frequency and extent of these surveys of sanitation are often specified by laws. In Pennsylvania the following is the wording of an Act:

"The medical inspector shall at least once a year, and as early in the school term as possible, make a careful examination of all privies, water-closets, urinals, cellars, the water-supply and drinking vessels, and utensils, and shall make such additional examinations of the sanitary condition of the school buildings and grounds as he deems necessary, or as the regulations of the State Department of Health or the rules of the board of school directors or of the local board of health requires."

RECORDS AND SYSTEMS OF RECORD KEEPING.

Much of the success of school medical inspection, its administrative control, results obtained, and tabulation of statistics of value, depend upon the records and system of record keeping. It is to school inspection what book-keeping is to a merchant.

Records are needed for the carrying on of the present work, the index of our activities and results, and the guide for future work. Medical inspection involves responsibility of several classes of workers, the doctor, the nurse, the teacher, the principal, and the parent. Each has special and individual responsibilities which coalesce, and each must assume his part to assure success. The records and system employed are the medium of coöperation between all parties.

The records are needed in compiling and tabulating weekly, monthly, and annual reports, and also in compiling

statistics of value to ourselves and others to extend and improve the activities.

While there are occasional attempts of uniformity in performing the work, few cities use the same system of records. The greatest progress will be attained when most of the cities and towns having school inspection will adopt a uniform system. Work and results may then be compared to the benefit of all cities. Some copy the forms used by others, adding new ones, and a few discarding part of the system copied. Forms are often adopted without a knowledge of their practicability. Many cities change their forms frequently, showing the present undeveloped condition of many systems. To enumerate and reproduce specimens of the forms used by various cities would require a volume and tend only to confuse the reader as to which are good and which are faulty. For our purpose it will suffice to enumerate some of the bad features of some of the systems.

Some cities have entirely too many forms, often duplicating clerical work and complicating the system, and simplicity is seldom the keynote. To some cities the expense of printing forms is no small item. Many of the blanks are long on columns and short on information of actual value. The number of medical, sociological and pedagogical questions which may be asked are unlimited, but the records should contain such information which is of practical value in deciding what action to take in the average case. It is undesirable and unnecessary to have a separate form to meet each emergency. The doctor and nurse frequently recording the time consumed in the performance of each duty is of little value, and such blanks are designed more for keeping tabs on the doctor and nurse than on the pupils. Complete and accurate records are necessary, but it is useless transcribing the same information a number of times. When 50 or 75 per cent of the physician's time is needed for clerical work, it would be economy to furnish him with a clerk.

One city uses 5 distinct and separate forms for each case, 1 for the teacher, which remains in the school as a permanent record, 1 for the nurse, 1 for the health department, 1 for the parent, and 1 for the medical inspector. Aside from the unnecessary expense and waste of time, such records cannot be referred to intelligently. Duplicate copies made by the use of carbon paper while saving time admits of copies which blur and cannot be kept for permanent records. All forms which are referred to frequently should be printed on cardboard and not on paper. All information which is of value to the work should be recorded, on one blank, arranged and filed in a manner to be available at a moment's notice.

Systems of record keeping in some cities are so faulty that they are useless when compiling statistics. Annual reports may show the number of examinations of children, but not the number of children examined; hence, percentage of defects found cannot be estimated.

A preliminary survey of a school of 2000 taken while the pupils pass in front of the inspector, the entire work taking one hour, should not be recorded as 2000 examinations, and as often happens, included with, say 10 individual thorough examinations, taking three hours, but should be recorded as so many classes examined.

Diseases and defects among the pupils are obtained from three sources: (1) Detected and sent by the teacher; (2) class-room inspections; and (3) individual examinations. There is no need for a separate blank to record the cases from each of these sources. The teacher in surveying her class each morning before beginning her exercises, should recognize the pupils requiring the attention of the attending physician, and note the name of child, class number, and reasons for referring to the doctor. The physician records the diagnosis and recommendation on the same blank and passes the card on to the nurse. Defects found by class inspections or individual examinations may be recorded on similar forms.

Defects which may influence the education of the child should be transferred to the card used to record the child's school attendance and progress. This report card should follow the child through the various grades and schools.

After studying the various systems of medical inspection, as employed in a number of cities of the United States, and eliminating the useless and impractical features, the author devised a system of inspection which has met all of the requirements for a simple and practical system. Gulich and Ayres, in their *Medical Inspection of Schools*, commends this system, and much of it with modifications has been adopted in Philadelphia and several other cities. While the blanks were devised for schools employing doctors and nurses, it is equally applicable to those having only physicians.

In devising the system, the chief factors considered were: (1) The elimination of useless clerical work; (2) methods which would assure coöperation between the medical inspector, nurse, principal, teacher, and parent; (3) the avoiding of unnecessary exclusion of pupils, and when excluded, their return in the shortest possible time; (4) the assuming by each party of his or her share of the responsibilities, so errors or derelictions may be traced to their source; (5) records and reports to be as few as possible, to afford simplicity, practicability, and easy reference at all times.

The system comprises the use of but one card, which is used to refer all cases and serve as a record for recommendations and actions taken. Some of these cards are in each class-room, and the teacher answers the questions and information desired on the upper part of the card, and sends it with the pupil to the inspector. This may seem to add more clerical work on the already overworked teacher, but it has been proved to save her time, trouble, and responsibility. Many of the younger pupils do not know their names, addresses, and number of class-room, much less why the teacher sent them to the doctor. The return of the

pupil to its teacher requesting the desired information means loss of time and the answer eventually sent upon any scrap of paper requiring copying by the doctor and nurse. The teacher filling the cards out before beginning her session's work, avoids the unwise plan of asking, "Who wishes to go to the doctor?" with a ready response from shiftless pupils who desire an excuse for leaving the class. The teacher personally observes who should be sent to the physician, and states on the card the reason for sending the child and avoids many cases of imposition.

The report cards may be printed on two different colors of cardboard. Blue cards for cases recommended for treatment; yellow cards for cases excluded for contagious diseases. By this distinction in colors, one can readily refer to the excluded pupils and follow them up to have the children returned at the earliest possible date.

In schools having a system of bells, the physician on visiting the school rings the bells on each floor a number of taps, which informs the teachers of his presence. Immediately the children are sent to him with their respective cards. In schools having no bells, each morning the teachers send to the principal's office the cards of the children to be examined, and the inspector sends to the classes for these pupils. The diagnosis and disposition of the case are written on these same cards, which are kept in the office. Each pupil sent to the inspector for examination receives one of the following slips to take back to his teacher:

To Teacher—

This child is referred for treatment to

.....

Nurse.
Dispensary.
Family Physician

This child.....excluded from the class-room until you receive notice for his (her) return.

.....

Medical Inspector.

Form for recording defects. Tab to be returned to teacher.

To Teacher—
This child is referred for treatment to

.....

Nurse.
Dispensary
Family Physician.

This child is.....excluded from the class-room until you receive notice for his (her) return.

Medical Inspector.

School.....Teacher.....Room No.....
Name.....Address.....
Date.....Sent to Medical Insp. for.....

.....

Diagnosis.....
Referred to physician—Dispensary—Nurse.
Excluded—Date.....Returned.....
Treatment by nurse—at home—at school.
Dates of treatment—
Total number of treatments—
Results—Cured
Improved
Not Improved

Nurse. *Medical Inspector.*

When a child is excluded, it may be given a card similar to the following, to take home to its parents.

.....*192*.....

Name..... *Age*.....

Address.....

Is Ordered to Discontinue Attendance at

.....*School located at*.....

Reason.....

.....

Medical Inspector.

(See Other Side.)

NOTICE TO PARENTS.

The disease mentioned on the other side of this card is a contagious affection and liable to be transmitted to other children. The child should receive prompt treatment by a physician (or at any dispensary), and should return to school ....., 192..... for reëxamination by the Medical Inspector. If found free from contagion at this time, he may resume attendance at school.

.....

Chief Medical Inspector.

On the tab returned to the teacher the doctor underscores whether the pupil is to go to the nurse, dispensary, or family physician for treatment, or whether excluded from the class. This admits of no mistake by the teacher, and aids her in knowing the exact nature and disposition of each case. The child cannot go home for the remainder of the day when he was instructed to wait for treatment by the nurse; and again, a child excluded cannot return to his seat in the classroom and the teacher remain ignorant of his exclusion by the inspector. It admits of the principal having a full written record of the disposal of all cases sent to the doctor.

SCHOOL, DIST. NO. ROOM NO.

SCHOOL, DIST. NO. ROOM NO.

NAME RESIDENCE

DATE EXAMINED 192 RESIDENCE

DEFECT (Use separate line for each defect.)		DEGREE*	TREATED†								NOT TREATED†		
			Priv. M.D.	Disp.	Nurse.	Parent.	Other agencies.	Cured.	Improved.	Not improved.	Refused by		Left school.
											Parent.	Physician.	
1													
2													
3													
4													
5													
6													

* Indicate by "S" if defect is severe. Give number of decayed teeth; acuity of vision in fractions, and indicate by "H" if headache exists.

† Indicate by check (√). If treated, check agency and degree of improvement; if not treated, check in one column only.

NURSE'S PROVISIONAL DIAGNOSIS.....
(Case seen first by nurse)

CHARACTER, DATES AND NUMBER OF NURSE'S SERVICES

DEFECTS	ADVICE TO PARENT AT		LOCAL TREATMENT	TAKEN TO DISPENSARY	DATE TERMINATED*
	SCHOOL	HOME			
1					
2					
3					
4					
5					
6					

Special Instruction to Nurse:.....

Medical Inspector.

Remarks:.....

* This card must be terminated by the end of the second month after the month of examination.

School Nurse.

SCHOOL, DIST. NO. ROOM NO.

SCHOOL, DIST. NO. ROOM NO.

NAME RESIDENCE

DATE EXCLUDED 192 RESIDENCE

EXCLUDED FOR	TERMINATION			Number of days absent*	TREATED BY				
	Date of readmission	Date left school	Summer vacation		Private M.D.	Dispensary	Nurse	Parent	Other agencies

Special Instructions to Nurse:

*Calculate calendar days, NOT school days

Medical Inspector.

FORM M 22—RECORD OF EXCLUSION—SCHOOL DISTRICT OF PHILADELPHIA (OVER)

NURSE'S PROVISIONAL DIAGNOSIS:.....

(Case seen first by nurse)

CHARACTER, DATES AND NUMBER OF NURSE'S SERVICES

DEFECTS	ADVICE TO PARENT AT		LOCAL TREATMENT	TAKEN TO DISPENSARY	DATE TERMINATED
	SCHOOL	HOME			

REMARKS:.....

.....

.....

.....

.....

School Nurse.

When the case is referred to the nurse, the doctor specifies on the card if the child is to be treated at home or at school, or both; also the treatment recommended. This concise written report makes mistakes impossible, and may prove valuable if legal or other questions arise. These cards are filed in the office in a box with three compartments: (1) New cases; (2) unfinished cases; (3) cured cases. Each compartment is arranged according to the number of class-rooms.

The nurse on visiting the school, first takes all cards in the compartment of new cases and sends for each pupil individually. The information on the card makes it possible for her to perform all her work without troubling the principal or teachers. After attending to the new case and recording on the card the date of treatment, she replaces them in the cabinet in the compartments of unfinished or cured cases. The nurse now looks over the unfinished cases and sends for those requiring treatment and records the date. She so proceeds each day until the child is cured or the case otherwise terminated, when she records the date of cure, when the card is filed in the third compartment. Once a month all finished cards are sent to the Bureau of Health or Education, where they are filed in a cabinet according to school and disease. One can readily perceive how easy it is to refer to these records. For example, should one desire to know how many cases of defective vision were treated and obtained the necessary glasses, or the average number of treatments required at school to cure a certain skin disease, these facts may readily be obtained.

The physician and the nurse render to their superior officers a daily and weekly report of the work performed. These reports are tabulated from the individual record cards kept at the schools. The report should be filled in each day and mailed to the chief inspector at the end of the week.

A set of forms used to record exclusions (printed on colored paper) and one for recommendations (white paper) is illustrated on pages 82 to 85.

A form suitable for recording the work performed by the nurse each day and totaled for the week is herewith shown:

Report for week ending.....192.....

.....
Nurse.

Report rendered.....

			M.	T.	W.	T.	F.	S.	Totals.	Home.	Disp'y.	Cured.
		Date.										
Summary.	Number of	Schools visited										
		Old cases										
		New cases										
		Cured										
		Visits to homes: Old										
		Visits to homes: New										
		Taken to disp'y: Old										
		Taken to disp'y: New										
		School consultations: Parents										
		School consultations: Pupils										
Number New Cases Treated.	Eye.	Exams. for:										
		Uncleanliness										
		Def. vision										
		Corneal ulcer										
		Conjunctivitis										
		Other diseases										
	Ear.	Def. hearing										
		Otorrhea										
		Other diseases										
	Nose-Throat.	Hypert. tonsils										
		Adenoids										
		Def. speech										
		Other diseases										
	Skin.	Pediculosis										
		Eczema										
		Pust. derm.										
		Impetigo										
		Ringworm										
		Scabies										
		Wounds										
		Other diseases										
	Orthop.	Scoliosis										
		Hip-joint disease										
		Other diseases										
		Teeth										
		Malnutrition										
		Nervous										
		Totals										

Remarks and Special Work:

A. A. CAIRNS, M. D.,
CHIEF MEDICAL INSPECTOR.

Dear Sir:—

The following is a weekly report of Nurse of Schools of Fourth Section.

WEEK ENDING											DISEASES FOR WHICH PUPILS ARE TREATED																	
	Date	Schools Visited	Old Cases	New Cases	Cured	Visit to Homes		Taken to Dispens.			Pediculosis	Ac. Conjunctivitis	Scabies	Ringworm		Impetigo	Favus	Eczema	Pust. Dermatitis	Inf Wounds	Defect Vision						Miscellaneous	TOTALS
						Old	New	Old	New					T	C													
Monday																												
Tuesday																												
Wednesday																												
Thursday																												
Friday																												
Saturday																												
Totals																												
Total number of cases cured																												

CASES TREATED AT HOMES

Date	Name	Address	Disease

CASES TAKEN TO DISPENSARY

Date	Name	Disease

A nurse's report: Form suited for a small filing card.

School clinics have been established in many cities. That they are a necessity at present is evident to any one who has made a survey in any city, of the dispensary facilities available for such special defects as of eye, ear, nose, throat and teeth. Even with clinics under health or educational departments no city has met their needs.

The author believes this duty of obtaining treatment is a purely medical one and someone in authority should so

organize existing dispensary and hospital service, and so supplement or increase it to meet all requirements without transfering part of such responsibility on municipal health bureaus or school systems.

To avoid dispensary abuse by free school clinics, each child should be investigated by the nurse or social visitor at its home to be assured that the parents cannot afford to pay. When a child is found to be a suitable case for free treatment, the nurse or medical inspector should fill in one of the accompanying blanks. One of these blanks properly filled in and signed by the nurse and principal is presented at the clinic when the child applies for treatment.

.....*192*.....

This is to Certify that.....*age*.....

Residence..... *School*..... *Section*..... *Grade*.....

is in need of dental treatment and the parents are unable to pay for the same. .....

Inspector.

.....

Principal.

Furnishing glasses to those pupils who not only are too poor to pay for professional services but also for the prescribed glasses is a problem. Some cities care for these cases by private or charity organizations meeting the expense. In Philadelphia an appropriation is made by the city to the Bureau of Health and a contract awarded to an optician. White metal frames are furnished at an expense of $1.00, and where the child is too proud to wear a white metal frame it is permitted to add $1.50 and procure gold filled frames. The wisdom of such an alternative may be questioned; but the author believes it is wise insofar as a discontented child will neglect to wear something it does not like; also the parents paying a part have an added interest and more care will be taken in the use of the glasses.

A similar type of form may be used for treatment of eyes or other defect at any of the clinics associated with the department.

FORM OF EYE-CLINIC RECORD CARD.

Case number.....

Diagnosis.....

Space for clinic stamp.

.....M.D.
Inspector.

Name.....Age.....Address.....P.S.....
Present grade..... Times not promoted..... Nationality of father.....
Years in United States..... In New York City.....
Personal history..... Has worn glasses? Yes.....No.....
Vision on admission R..... R.....
(Without glasses.) (With present glasses.)

L..... L.....
Ophthalmoscopy R..... Fundus.....
and
retinoscopy L.....
Ophthalmometer R..... Mydriasis with atropine..... { at clinic
L..... with homatropine..... { at home

TREATMENT.

Date.	Vision under mydriasis.	Final refraction (without drops).	Glasses ordered.	Case terminated.
.....	R..... L.....	R..... L.....	R.....	Date.....
.....	R..... L.....	R..... L.....	L.....	Cured.....Improved.....
.....	R..... L.....	R..... L.....	.....	Unimproved. Transferred.

Department of Health, City of New York, Bureau of Child Hygiene. | School Medical Inspection. Oculist's Case Card-refraction.

The medical inspector should when leaving a school, take an account of the work he performed that day. He should note a summary of the number of examinations,

cultures, vaccinations, etc., also exclusions and diseases for which pupils were excluded, and recommendations for treatment. These items should be totaled at the end of the day and written on the "Weekly Report" sheet, which is to be returned to the central office. These notes may be kept on one of the weekly sheets, using a blank for each day and placing name or number of school in place of the day or week.

"Weekly Report" sheets should show a complete detailed history of the work performed. These reports are the only record which the supervisor has to scan each week to know the character and quality of work performed by the various inspectors. It is important that the supervisor should keep at his office a "blotter" or large sheet containing all of the columns recorded on a weekly report blank, and a space for each inspector.

The reports are transferred to this "blotter," where they can be added to find the total work performed by the entire corps during the week. It also serves to make comparisons of the work performed by each inspector. The chief or supervisor has formed averages for each disease excluded or recommended for treatment. He can study from these sheets the shortcomings of the men under his charge. He receives his suspicions as to where he should personally visit, observe and instruct to make the work uniform and effective.

When the individual record cards, which have been closed because the defects or diseases have been treated and cured, have been returned to the central office, they should be counted to see if they tally with the numbers reported by the inspectors.

The preceding form is recommended for a "weekly report" of the work performed by a medical examiner.

MEDICAL INSPECTOR'S REPORT FOR WEEK ENDING.....

		Schools visited.
		Pupils sent to medical inspector.
		Class-room insp., No. pupils exam.
		Individual examination.
		Special examination.
		Total examinations.
		Cultures.
		Examination vaccination.
		Vaccinations.
		Sanitation inspections.
		Recommendations for treatment.
		Exclusions.
		Exclusions returned.
		Home visits.
		School consultations.
		Not vaccinated.
		Contacts contagious.
		Scarlet fever.
		Diphtheria.
		Measles.
		Chickenpox.
		Whooping-cough.
		Mumps.
		Rubella.
		Suspic sore throat.
		Trachoma.
		Ac. conjunctivitis.
		Scabies.
		Impetigo.
		Ringworm of scalp.
		Ringworm of body.
		Favus.
Monday		
Tuesday		
Wednesday		
Thursday		
Friday		
Total		

SUMMARY. EXCLUSIONS.

FOLD HERE.....

RECOMMENDATIONS FOR TREATMENT.

	Defective vision.	Conjunctivitis.	Other diseases of eyes.	Defective hearing.	Otorrhea.	Other diseases of ears.	Enlarged tonsils.	Nasal obstruction.	Other diseases of nose and throat.	Decayed teeth.	Defective speech.	Impetigo.	Ringworm of scalp.	Ringworm of body.	Eczema.	Other diseases of skin.	Wounds and injuries.	Malnutrition.	Diseases of chest.	Diseases of abdomen.	Other systemic diseases.	Mentally subnormal.	Scoliosis.	Other orthopedic defects.								
Monday Tuesday Wednesday Thursday Friday																																
Total																																

District No............ *Inspector*..

AUXILIARIES TO SCHOOL INSPECTION.

The medical and sanitary supervision of schools is not a problem for the physician alone, but requires the concerted action of all parties concerned. School authorities, principals, teachers, nurses, parents, and institutions allied to the medical profession, such as hospitals and dispensaries, must work harmoniously and add their quota to the work to accomplish results.

Teachers and Principal.—The interest manifested by the teachers and principal contribute greatly to the success of school inspection. Indifference or ignorance on the part of a teacher may allow an epidemic of a contagion to spread by failure in recognizing a sick child and sending it to the inspector for diagnosis. Thus poor results in teaching are obtained and a burden added to the teacher because pupils suffering from uncorrected physical defects are permitted to remain in the class.

Coöperation between the school and the doctor depends largely upon the physician's diplomacy. He can do much to stimulate interest in his work by occasional talks at meetings of the teachers. On these occasions the physicians can train the teachers to recognize certain diseases and defects. Instructive talks by the principal will also awaken interest. Fortunately, few teachers and parents are now ignorant of the benefits derived from medical inspection, and many welcome the work. The antagonism exhibited by some teachers during the early days of medical inspection was mainly due to a mistaken idea that it would place additional work upon them, but when they found that the recognition of defects and their treatment eliminated many of the backward and unruly pupils and lightened their burdens, their indifference ceased.

Teaching of Hygiene.—The value of school inspections is measured by the results obtained and the permanency of the effects, not by the number of children examined and per-

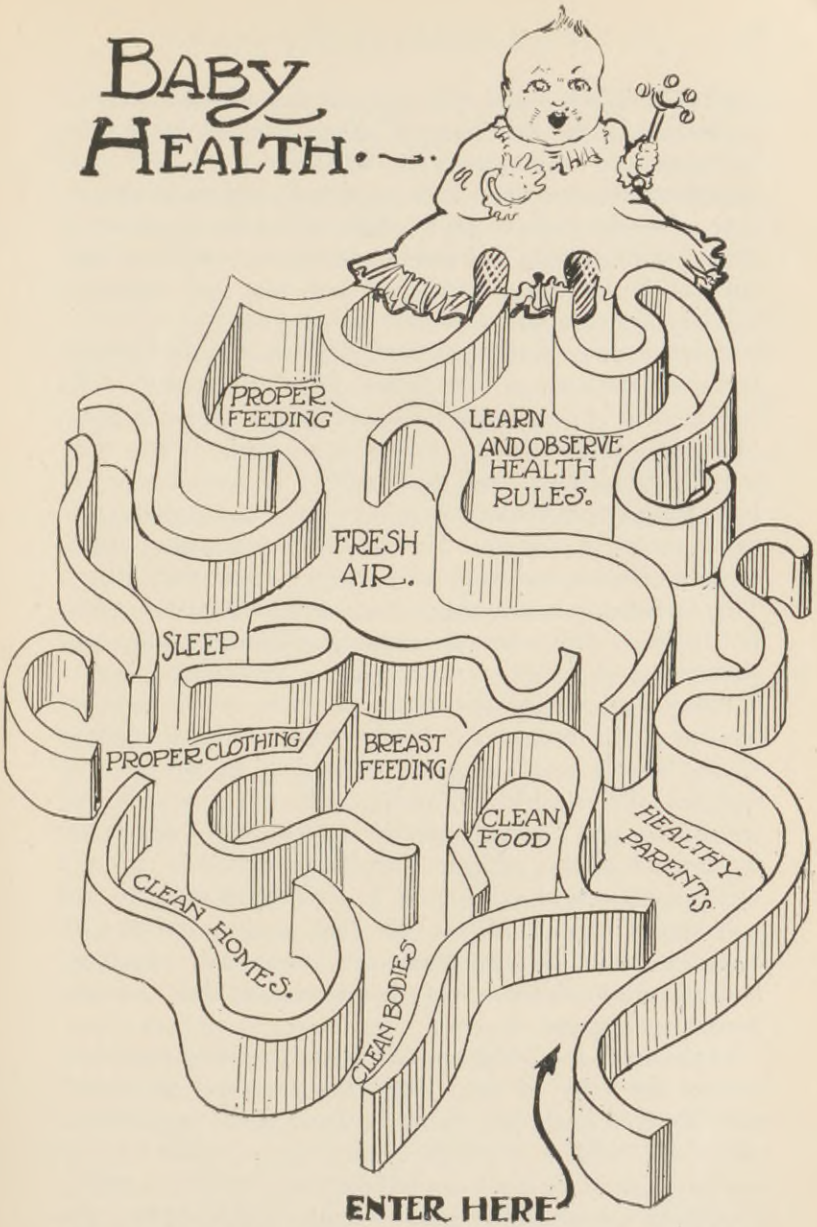


FIG. 3.—A health circular drawn by the author and used in a health-day campaign.

centage of defects found. To correctly diagnosticate a defect or disease is the first step of school medical inspection; to recommend treatment is the next; and third, and most important, to have the defects corrected. Of equal importance is teaching about good health. Here the physician is dealing with parents and children of all temperaments, and only by the exercise of good judgment, tact and diplomacy will he succeed in arousing some parental action.

Public hygiene and sanitation, of which school inspection is a part, aims not to cure disease but to prevent it. The best method of preventing sickness among school children is to teach healthful living. A part of all public health work must be educational, and the condition of good health will be most marked where the people learn and practise the requirements of hygiene. The child must learn what causes certain diseases and how to protect himself and others. This knowledge is not only a lasting benefit to the pupil, but to those with whom he comes in contact at home and elsewhere.

Every opportunity should be taken to teach practical hygiene in the class-room. Incorrect posture in standing or sitting should be an occasion to explain to the class its dangers. Practical lessons at opportune times make lasting impressions and a certain number of hours each week should be devoted to the subject. Text-books should be selected which are practical and written in an interesting style, that will appeal to a child. In the first grades, stories with hygiene lessons as their basis are instructive. Anatomy and physiology should always be illuminated with practical lessons on hygiene.

If the teeth are under consideration, the child should be taught the value of good teeth, the pain and discomfort with decayed teeth, the change in shape of the face through their loss, and how to preserve them. In a similar way the various parts of the body can be taken up. Instead of merely describing a bone of the spinal column, explain at the same time curvature of the spine and its causes.

The medical inspector when present at the time of a lesson in anatomy, physiology, or hygiene may aid in the instruction. The number of effective lessons which may appeal to the child is limited only by the ingenuity of the teacher. Two commendable examples were recently observed in a school. The pupils were requested to cut out of newspapers or magazines, and each pupil bring one picture whether advertisement or otherwise which pertains to their personal health. These were mounted on paper in class, colored by the pupils and all hung around the class-room for common observation. See Fig. 74, page 338.

A teacher requested each child to draw a large basket, and cut its outline. They took these home and pasted in them pictures of nutritious foods either gleaned from magazines or drawn.

A health day in a school with numerous endeavors to emphasize good health, and small prizes awarded to class and pupils gave astounding results.

School Text-books on Hygiene.—To insure good teaching, there must be good text-books. No other subject in the school curriculum has received such little attention by competent authors as practical hygiene. Hampered by rules of school boards, which govern the subjects written upon, the scope of the work, and the authors, who are seldom medical men trained in public health problems, little can be expected of the class of books published. The children should be systematically instructed in the principles of sanitation and hygiene according to their age and receptiveness. The text-books must be written in a simple manner, and suitable for school use. *Personal* hygiene is of more importance than general and public hygiene, and a study of rare diseases can be profitably omitted. Likewise, inadvisable are gross exaggerations of the evil effects of alcohol and tobacco, which ascribe every ill to which the body is heir to the use of these drugs. Hygiene should be designed as a progressive study, adapted to the varying capacities of each

class from the primary to those more advanced. The facts should be developed and advanced from grade to grade, always keeping within the limits of comprehension. The same truths repeated and gradually enlarged become part of the child's stock of intelligence; he learns, yet scarcely remembers when or how, and the lessons stick and influence his future life. To instruct, one must interest, and this is accomplished by well-written incidents from everyday life. Illustrations should be carefully selected to appeal to a child, and with a view toward helping to understand the text.

Parents.—There always will be a few parents who through indifference, ignorance, or neglect are unmindful of the physical needs of their children. Nothing has encouraged cooperation between home and school more than medical inspection of school children. The physician and the nurse with their home visits and school consultations have obtained remarkable results. The parents are shown that their children are not only receiving instruction in arithmetic and languages, but that the school authorities are interested in everything that concerns the physical, mental and moral development of their charges. This interest on the part of the school, however, should not relieve parents of their responsibilities. Wherever possible they should do their share and be encouraged to render the assistance that is their duty.

Parents' meetings at the school, held in the evening when parents are free from home duties, are invaluable. Here the school physician can with interesting lectures accomplish much that will benefit the home and the children, and incidentally aid him in his work. If these lectures are illustrated by means of lantern slides, the public may be more readily instructed in the work performed by school physicians, the protection against prevalent diseases and other public health problems.

Specialists.—Accuracy in diagnosis is needed to prevent spread of contagion. The physician, if in doubt regarding

a suspicious case, cannot with impunity allow a child to remain at school while he watches the developments, nor can he wait twenty-four hours for the result of a culture to verify the diagnosis of a suspicious diphtheria. For these reasons some system should be adopted which places at the

FIG. 4.—Six dental hygienists render prophylaxis to 120 children per week. (Monthly Bulletin Department of Public Health, Philadelphia.)

request of inspectors the immediate services of expert consultants, to whom may be referred all cases in which the medical inspector is in doubt as to the diagnosis. A rule of excluding a doubtful or suspicious case for a period of three days for observation may be effective in protecting the class, but if the parent fails to immediately call a competent

family physician the case, if communicable, may offer untold harm to the public.

A department which fails to avail itself of the services of physicians on the corps who in private practice specialize in some branch of medicine is losing a valuable asset. These requests always stimulate the inspector's interest and he then feels he is not a mere machine but of some importance. The office should maintain an office record of each inspector, noting name, address, telephone, and specialty when practised. This must be handy to the telephones.

Special School Clinics.—In America little has been done to create school clinics, but abroad they are a feature of school medical inspection. In this country, eye and dental and a few for nose and throat work are the only clinics held directly in connection with school work. Dental examinations and treatments are available in most of the large cities and in some on a large scale. Philadelphia has a corps of paid dentists who devote time every day to the school children at clinics fitted out at 12 health centers. This city also has a clinic in the City Hall in charge of a competent ophthalmologist for the examination and treatment of the eyes. Dental hygienists are employed in several cities and their work is recognized as being in the right direction for solving the dental problem.

Dispensaries and Hospitals.—It is evident that dispensaries and hospitals are necessary adjuncts to the physicians' work in the schools. School medical officers in most cities are forbidden to treat any child attending the schools under his supervision. This is a wise ruling, as it prevents the possibility of abuse of power and interference in the work of attending physicians. All patients are referred to their parents or guardians, to be taken to their family physician, or if too poor, to a dispensary. The school doctor and nurse must be informed of the dispensary hours for the various specialties at the different hospitals. Where clinic hours interfere with school sessions, arrangements can be made with some hospitals to have special clinics after school.

In most cities, one of the greatest obstacles to obtaining results is an inadequate dispensary service for treatment of eyes, throat and teeth. When a nurse is limited to taking to clinics 3 eye and 5 dental cases per week, her work and results are curtailed to an alarming extent. The correction of this evil rests with the executive head of the school department who should hold conferences with hospital and other authorities to urge an enlarged service and added privileges for the school population.

FIG. 5.—School eye clinic in charge of ophthalmologist, Philadelphia.

Social Visitors.—Parental neglect, ignorance, poverty and many social aspects must be studied constantly, because it is these conditions which make it difficult to arouse parents to take some action on recommendations of the school physician. The trained school nurse is the best solution of the problem. However, in some cities where nurses are not employed, social workers and visitors are of service. They can visit homes, interest parents in the necessity of giving proper treatment, and, where poverty exists, seek the aid

of one of the charity organizations when necessary. In some cities the percentage of cases which receive treatment is but a small fraction of those recommended. This is oftentimes due to neglect to study social and home conditions and apply efforts in those directions.

While some States have compulsory examination of school children, no State or city has any law which compels a parent to act upon the recommendations of the physician. Irrespective of the non-existence of such statutes in cases of stubborn parents, much can be accomplished by the tactful trained nurse, the proper use of the Society to Protect Children from Cruelty, and the Bureau of Compulsory Education. However, the two latter institutions should not be resorted to until all other means have been exhausted. In Pennsylvania the compulsory education laws cannot legally be used for this purpose, as the code states, "Any pupil prevented from attending school on account of the health or sanitation laws of this Commonwealth is hereby relieved from complying with the provisions of this act concerning compulsory attendance."

Outside Coöperating Organizations.—The number and kind of organizations which may render services to the cause is legion. It is surprising what can be obtained in valuable volunteer services if one seeks it. A department must not fall into the error of seeking or accepting offered services of work which can and should be performed by its own employees. This eventually causes jealousy and friction. One need not fear loss of due credit for results obtained, as a coöperating agency obtaining results, as a matter of course permits an equal share of credit to reflect to the city department. In reports the department should duly credit all organizations giving services. Before accepting any service, be sure that the donor is sincere and unselfish, and is not offering a fad which will require some of the needed time and energy of the department. Many a newly organized city department has failed to progress or gone on the rocks

because the executive did not know when or feared to say "No," to some offers of aid. The author knows of existing endeavors which are purely commercial and utilizing some of the needed funds while feigning to give aid and charity. Tactful, diplomatic refusal of suspicious volunteer services is a valuable asset for an executive.

There are many useful endeavors which cannot be accomplished alone by the educational or health authorities, and outside aid should be welcomed. Antituberculosis societies, health leagues, and safety first committees are but a few of the coöperating organizations.

INSPECTION OF TEACHERS AND JANITORS.

The health of the teacher is of great importance to the public school system, in some respects even more so than the pupils under their care, and yet little has been done to assure by inspection a staff of normal healthy teachers.

Tacoma, Washington, has a law that excludes from school, teachers and janitors as well as children afflicted with tuberculosis. Pennsylvania has a similar section in its School Code: "No person having tuberculosis of the lungs shall be a pupil, teacher, janitor or other employee in any public school, unless it be a special school carried on under the regulations made for such schools by the Commissioner of Health."

A teacher or janitor with such diseases as tuberculosis, especially tuberculous affection of the throat, consumption, coupled with carelessness in spitting or uncleanliness, and syphilis in certain stages, may produce untold harm if unrecognized. There are other ailments, which, when possessed by a teacher, while not communicable are detrimental to the education of the pupils. Extreme nervousness and irritability, whether due to general physical breakdown or some existing defect, is sure to give results which react on the pupils. Chronic laryngeal catarrh, defective hearing

or vision and many other defects in the teacher should be recognized as of more importance than in a pupil.

The mere furnishing of a certificate of health to the board of education is insufficient, as there are some unthinking or unscrupulous physicians who for the sake of a fee may issue such a certificate to a teacher when they know she is suffering from some defect that may prove detrimental to the school.

In the State of Massachusetts the law says the medical inspector shall make "such further examinations of teachers, janitors, and school buildings as in his opinion the protection of the health of the pupils may require."

The School Code of Pennsylvania reads:

SECTION 1320. "No teacher's certificate shall be granted to any person who has not submitted upon a blank furnished by the Superintendent of Public Instruction a certificate from a physician legally qualified to practise medicine in this Commonwealth and authorized by the Board of Education, setting forth that said applicant is neither mentally nor physically disqualified—by reason of tuberculosis or any other chronic or acute defect, from successful performance of the duties of a teacher; nor to any person who has not a good moral character, or who is in the habit of using opium or other narcotic drugs in any form, or any intoxicating drinks as a beverage."

The foregoing is evidence that a few States are alive to the importance of medical inspection of teachers and other school employees, and have taken steps to safeguard the pupils. The importance of a staff of normal healthy teachers cannot be emphasized too strongly, and any community installing a system of school inspection must necessarily provide some form of legislation to cover this point if the system is to be complete and efficient.

Teachers should not be permitted to teach until duly certified after a careful physical examination. Pupils entering normal schools and annually until graduation should

receive an examination. The physically unfit should be refused admission or discouraged from continuance. Irremediable defects of vision or hearing, organic heart disease and disabling orthopedic deformities should be sufficient to exclude from the profession.

The following is a form for recording the results of examination:

CERTIFICATE OF PHYSICIAN IN REFERENCE TO

LAST NAME_____ FIRST NAME_____

Has the applicant phthisis?

Has the applicant any contagious disease of the skin or of the mucous membrane?

Has the applicant any defect in hearing? If so, describe its extent.

Has the applicant any irremediable defect in vision?

Has the applicant any defect or disease which will probably disqualify him or her from performing regularly the duties of the position?

Has the applicant been successfully vaccinated?

DATE_____ 192_____ (SIGNED)_____ M.D.

ADDRESS_____

FORM XH 3—CERTIFICATE OF PHYSICAL FITNESS—SCHOOL DISTRICT OF PHILADELPHIA

QUESTIONS TO BE ANSWERED BY THE APPLICANT

LAST NAME_____ FIRST NAME_____

ADDRESS_____

Have you had any severe illness within the last year? If so, what was it?

How much time have you lost from your studies, attendance at school or vocation, through illness during the last two years?

Have you any disease of the eye, the throat or the ear?

Have you been successfully vaccinated?

I am an applicant for

DATE_____ 192_____ (SIGNED)_____

APPLICANT

PART II.

THE SCHOOL BUILDINGS AND GROUNDS.

INSPECTION OF SANITATION.

An important part of medical inspection consists in the inspection of sanitation of school buildings and grounds. This is mandatory in some States, and the laws not only direct how such examinations shall be conducted, but also contain specific provisions for the erection of new schools, alterations of old ones and planning of the school grounds. One cannot teach hygiene and healthful living surrounded by insanitary buildings in which to conduct classes. Attractive, well-ventilated, and well-kept school-rooms are in themselves an object lesson and an incentive for the pupils to try to live properly. For the medical inspector to recognize insanitary conditions and faulty construction, he must be trained to know what is necessary to make a school building suited to the needs for which it was built. All defects must be properly noted and a report given to the authorities who have the power to remedy them.

Inspections should be made at least once a year, and oftener if required. The inspection should include every part of the building, including its drainage, plumbing, heating, ventilation, cleanliness, etc. All urgent repairs or insanitary conditions found should be noted in a special report, and a reëxamination made in a reasonable time to note what action has been taken. In some cities it may

require a fearlessness on the part of the inspector to report certain shortcomings.

Measurements and calculations should be made showing the amount of air space per pupil and the amount of window and lighting space. These should be placed on a record blank for permanent filing in the health department or the board of education. With it might be filed a plan of the building furnished by the architects. This information when once properly and fully recorded and filed, need not be taken again unless some changes or alterations are made to the building or ground.

Reports must not be made on the word of teacher, principal, or janitor, but only by the personal observation of the inspector. While these authorities may call attention to defects which may otherwise be overlooked, all complaints should be verified by the physician.

The medical examiner should begin his examination by a thorough inspection of the grounds surrounding the school. The out-houses, water-closets, and urinals should be inspected for distance from building, ventilation, cleanliness, condition of plumbing and drainage, number of seats in relation to school attendance, and accommodations for small children. The kind and condition of paving on school grounds, the presence of any stagnant pools of water, playground facilities, and the amount of space per pupil should be noted.

The inspection of the building should include attics, basements, cellars, and all closets for cleanliness; also the kind of flooring in cellars, dampness of walls, presence of water, or accumulation of refuse and ashes. Study the kind and condition of the heating apparatus and the air intake, also whether such conduits are properly screened. The absence of a cellar, with building directly on ground, may greatly affect the health of the children.

The inspection of class-rooms includes the measurement of each room to find the amount of air space allotted to each child and the amount of window space. The lighting

should be studied in its relations to the pupils, and whether obstructed by adjoining walls. The seating of the pupils should be noted while the class is in session, as adjustable seats and desks may not be properly adjusted. The kind of desk and chair used should be noted in the report, also the temperature and humidity of each room and improvements where needed recommended.

Coat-rooms and toilets should not be overlooked. There should be a separate hanger for each child and the coat-rooms should be ventilated. The indoor toilets should meet the requirements of the children, and flushing and plumbing should be in perfect condition.

The water-supply is very important, and the source and purity should be investigated. If filters are used, they should be clean and in working order. The facilities for drinking and the use of individual cups or drinking fountains should be noted.

All observations should be immediately placed on a permanent record to be kept on file at the central office. It is surprising in how few cities the condition of school buildings is known.

REPORTS ON SANITATION.

The following is a good blank for reporting on the sanitation of school buildings:

These reports should be filed in the office of the health department and all changes should be noted and filed with the first report.

RECORD OF INSPECTION OF SCHOOL PLANT.

DATE ....

SCHOOL ....

LOCATION ....

WARD ....

												ERECTED (YEAR)	REMODELED (YEAR)
	PUBLIC		HIGH		RENTED	STONE			CEMENT				
	PAROCHIAL		GRAMMAR		MAIN	BRICK			WOODEN				
	PRIVATE		PRIMARY		ANNEX	MIXED			FIRE PROOF				

			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
SEATING	PUPILS ENROLLED	ROOM	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
		1921																										
		1922																										
		1923																										
		1924																										
	ACCOMMODATION																											
LIGHT	RELATION TO PUPILS	LEFT																										
		RIGHT																										
		ABOVE																										
		BEHIND																										
		BEFORE																										
	ARTIFICIAL																											
	OBSTRUCTED																											
	DIRECT																											
WINDOWS	TOTAL SQ. FT.																											
	WIDTH FT.																											
	HEIGHTH FT.																											
	NUMBER																											
CLASS ROOM	CU. FT																											
	LENGTH FT.																											
	WIDTH FT																											
	AVERAGE HEIGHTH FT.																											
	NUMBER																											
	FLOOR																											

COAT ROOMS	LIGHT	ARTIFICIAL	
		NATURAL	
	VENTILATOR		
	NUMBER		
TOILETS	VENTILATOR		
	HEATED		
	URINALS	SPACES	
		INCHES	
	NO. SEATS	BOYS	
		GIRLS	
	KIND	FLUSH	
		DRY	
	LOCATION	FLOOR NUMBER	
		BASEMENT	
		LEAN-TO	
		OUT BLD'G	
VENTILATION	WINDOW		
	GRAVITY		
	PLENUM		
	VACUUM		
HEATING	INDIRECT	STEAM	
		FURNACE	
	DIRECT	HOT WATER	
		STEAM	
		STOVE	

DATE	ACTION OBTAINED

INSPECTION		TEMP. OF CLASS ROOM			GENERAL SANITARY CONDITION													WATER SUPPLY						REMARKS	REFERRED	DATE
													OF DIRT & REFUSE ACCUMULATION													
DATE	BY WHOM (INITIALS)	MAXIMUM	MINIMUM	NUMBER OF CLASS ROOMS 68° TO 70°	BUILDING CLEAN	DAMP SAWDUST USED IN SWEEPING	TOILET PLUMBING IN WORKING ORDER	TOILETS EMIT OFFENSIVE ODOR	PRIVY WELL FULL	DISINFECTANTS USED	CELLAR DAMP OR OTHERWISE INSANITARY	NUMBER OF PUPILS IMPROPERLY SEATED	CLASS ROOMS	HALL WAYS AND CLOAK ROOMS	CELLAR	PLAY GROUNDS	ADJOINING ALLEYS	WHAT MEANS FOR DRINKING	RAW (WELL)	FILTERED (CITY)	FILTERED (SCHOOL)	SCHOOL FILTER CLEAN	FIRE ESCAPE UNOBSTRUCTED AND IN GOOD CONDITION			

Table VIII.—Standard Figures Used in Grading Sanitary Items in School Buildings.

Item.	Method of circulation.	Grades.				
		Excellent.	Good.	Fair.	Poor.	Bad.
Ventilation	Cu. ft. air space per child	200.0 or more	199.9–175.0	174.9–150.0	149.9–133.3	132.2 or less
	Proportion of proper supply	*Standard*	*Standard* $\frac{7}{8}$	$\frac{7}{8}$–$\frac{3}{4}$	$\frac{3}{4}$–$\frac{2}{3}$	$\frac{2}{3}$ *or less*
Illumination	Relation of window area to floor area	0.20 or more	0.1999–0.1667	0.1666–0.1250	0.1249–0.1111	0.1110 or less
	Proportion of proper supply	*Standard*	*Standard*-$\frac{5}{6}$	$\frac{5}{6}$–$\frac{5}{8}$	$\frac{5}{8}$–$\frac{5}{9}$	$\frac{5}{9}$ *or less*
Desk provision	Sq. ft. floor space per desk	15.0 or more	14.99–13.13	13.12–11.25	11.24–10.0	9.99 or less
	Proportion of proper supply	*Standard*	*Standard*-$\frac{7}{8}$	$\frac{7}{8}$–$\frac{3}{4}$	$\frac{3}{4}$–$\frac{2}{3}$	$\frac{2}{3}$ or less
Boys' toilets (seats)	Boys per seat	40.0 or less	40.01–60.0	60.01–120.0	120.01–160.0	60.01 or more
	Proportion of proper supply	*Standard*	*Standard*-$\frac{2}{3}$	$\frac{2}{3}$–$\frac{1}{3}$	$\frac{1}{3}$–$\frac{1}{4}$	$\frac{1}{4}$ *or less*
Boys' toilets (common wall urinals)	Boys per inch wall space	1.25 or less	1.251–1.875	1.876–3.75	3.751–5.0	5.001 or more
	Proportion of proper supply	*Standard*	*Standard*-$\frac{2}{3}$	$\frac{2}{3}$–$\frac{1}{3}$	$\frac{1}{3}$–$\frac{1}{4}$	$\frac{1}{4}$ *or less*
Boys' toilets (individual urinals)	Boys per individual urinal	24.0 or less	24.01–36.0	36.01–48.0	48.01–60.0	60.01 or more
	Proportion of proper supply	*Standard*	*Standard*-$\frac{2}{3}$	$\frac{2}{3}$–$\frac{1}{2}$	$\frac{1}{2}$–$\frac{2}{5}$	$\frac{2}{5}$ *or less*
Girls' toilets	Girls per seat	24.0 or less	24.01–36.0	36.01–48.0	48.01–60.0	60.01 or more
	Proportion of proper supply	*Standard*	*Standard*-$\frac{2}{3}$	$\frac{2}{3}$–$\frac{1}{2}$	$\frac{1}{2}$–$\frac{2}{5}$	$\frac{2}{5}$ *or less*
Yard area	Square feet per pupil	36.0 or more	35.99–24.0	23.99–12.0	11.99–9.0	8.99 or less
	Proportion of proper supply	*Standard*	*Standard*-$\frac{2}{3}$	$\frac{2}{3}$–$\frac{1}{3}$	$\frac{1}{3}$–$\frac{1}{4}$	$\frac{1}{4}$ *or less*
Drinking water facilities	Pupils per faucet	50.0 or less	50.01–75.0	75.01–150.0	150.01–200.0	200.01 or more
	Proportion of proper supply	*Standard*	*Standard*-$\frac{2}{3}$	$\frac{2}{3}$–$\frac{1}{3}$	$\frac{1}{3}$–$\frac{1}{4}$	$\frac{1}{4}$ *or less*

CONSTRUCTION OF SCHOOL BUILDINGS.

General Considerations.—The construction of a school building is beyond the scope of this work. It is considered here only in a general way for the purpose of helping the inspector to recognize those conditions that are insanitary or detrimental to the health of the children. Details of arrangement of rooms and the division of floor space should be according to available space and the needs of the occupants. The basement, often neglected, should receive consideration as to flooring, heating, absence of dampness, ventilation and light. Roofs should afford protection against rain or snow, and against the heat in summer. Ample provision must be made for playgrounds.

It is essential that schools shall be built upon proper sites, and with due regard for adequate heating, lighting and ventilation. There should be a sufficient supply of pure water, and the plumbing and drainage should be an approved sanitary system.

Buildings should preferably be two stories high, and all buildings should be fire-proof. Where space admits, a school should contain besides its class-rooms and administration offices, assembly halls, physical training-rooms or gymnasiums, a room for manual training, sewing or cooking classes, and possibly a library. One of the rooms should be set aside for the work of the medical inspector and nurse. This room should be well-lighted and furnished with running water.

The basement should be two-thirds above street level, so as to allow plenty of light and ventilation. An entrance can then be located in this part of the building when desired. Lockers placed in basement would prevent rain and snow being tracked through the building in bad weather. The basement could also be used on rainy days for recess or it would serve as a location for toilets and other lavatory equipment.

The stairs should be wide enough to allow classes coming

and going. The material for steps should be such as will not wear slippery or dusty. Railings should be constructed so as to be easily cleaned, the halls should be well-lighted and not dependent on light from class-rooms. Walls should be burlapped and glazed or of material that will stand wear and tear and cleaning.

The Committee of Medical Inspection of Schools of the American Medical Association made the following comments after an investigation on the school buildings in this country, June, 1911: "Although some cities have added new buildings and improved old ones, much remains to be done.

"Many schools are unfit for use and should be torn down. One-fourth of the schools need to be reconstructed. Recent school buildings are much better, and yet any number of faulty constructions are still going on. What is needed is a more vigorous educational campaign in what hygiene, sanitation and efficient living require. What is still more needed is:

"1. The endorsement of certain standards and requirements in the planning and maintenance of school buildings and grounds by state and national educational and medical organizations.

"2. The enactment of legislation which will define these standards and insure the erection and modification of school buildings in accordance therewith."

The "Ten Commandments of School-house Construction" by William E. Chancellor, of Norwalk, Connecticut, are well worth quoting:

"1. Whenever possible, the school building should have sufficient ground and be so oriented on its plot that into every school-room the sunlight will come directly at least one hour each day.

"2. Every school-house, whether in city or country, when over one story should be strictly fireproof.

"3. Every school-house should have at least two outer doors, for entrance and exit, with doors opening outward,

and one outer door for every two rooms above four ground-floor rooms; and at least two stairways with an additional stairway for every two rooms above four upper-story rooms, stairways not over 5 feet nor less than 4½ feet wide. In other words, the fire-proof building should be also as nearly panic-proof as human ingenuity and material resources permit.

"4. In every school-house the halls should be well-lighted from end to end.

"5. The toilet conveniences, when possible to avoid it, should not be placed in basements; either isolated towers or separate buildings should be used.

"6. Every child is entitled to at least 20 square feet of floor space in each class-room attended, and to at least 300 cubic feet of air space; to a complete change of air every eight minutes, and to playground space at least equal to class-room space. With artificial heating and ventilating systems the problem is extremely difficult. Fresh air taken into the heating chamber should be taken from a height of 10 to 12 feet above ground. All air ducts should be kept free from dust. The heated air should contain the proper amount of moisture. The air ducts conveying the foul air from class-rooms should be of sufficient size and construction that the change of air is possible.

"7. Unilateral or quadrant lighting has come to stay as the standard. With it has come the standard of not less than 20 nor more than 25 square feet of floor space as the lighting area. The arrangement of this lighting is a technical problem not well met thus far.

"8. Each class-room should have its own separate wardrobe.

"9. Each class-room should have two or three sets of lockers for books so that day and evening pupils or morning, afternoon and evening pupils may use desks without interference with one another's property and without the resultant contamination and disease infection.

"10. Hitherto the notion has been to fit the school pupils into desks and chairs for book study. The new idea is to give to them space and opportunity for activity and development. It follows that the school, instead of being the mould for the pupils to fit, must itself be moulded by the course of study. The old unit idea of 50 children to a room, and as many rooms of a standard size as there are classes of 50 children each, is giving way to the idea of the universal school with such rooms as these—viz.: (*a*) assembly and music halls; (*b*) physical training drill-rooms or gymnasiums; (*c*) drawing rooms; (*d*) offices and rooms for principal, head teachers, janitor, etc.; (*e*) science and art museums; (*f*) libraries and reading-rooms; (*g*) work-rooms for manual training, trades, handcrafts and domestic science and art. In every instance in which desks are used in class-rooms, the desk should be adjusted to the child and not the child to the desk."

The total value of the public school houses in the United States is over $1,000,000,000, and according to William E. Chancellor, one-half of them are so abominable that they should be razed to the ground. There are some ideal school houses, such as the Charlestown High School in Boston; the Wyman School, St. Louis; the Bernard Moos School, Chicago; Rosedale School, Cleveland, and the Morris High School, New York. Recently constructed buildings in Philadelphia are splendid examples of the latest developments in school construction, and several are illustrated on pages 124 and 125.

Buildings.—Interviews and studies made by the author in the offices of departments of building of schools, has impressed him with the unjust criticism, in many instances, of inefficiency. The systems of records, plans, specifications and reports are appalling to an outsider. It is easy for one to criticise the work of others, but how often we are misinformed, ignorant and possess half-baked opinions. Our ideas may differ from anothers, but it is possible that theirs may be as correct from their view. We should be reserved

FIG. 6.—Types of school buildings, Philadelphia. Anthony Wayne elementary school, 1908.

FIG. 7.—Types of school buildings, Philadelphia. Type of 1818.

FIG. 8.—Types of school buildings, Philadelphia. William Penn high school for girls.

FIG. 9.—Types of school buildings, Philadelphia. Mitchell Junior high school.

FIG. 10.—Types of school buildings, Philadelphia. Type of 1812.

FIG. 11.—Types of school buildings, Philadelphia. Interior of type of 1812, equipped for present use.

FIG. 12.—Types of school buildings, Philadelphia. Type of 1870.

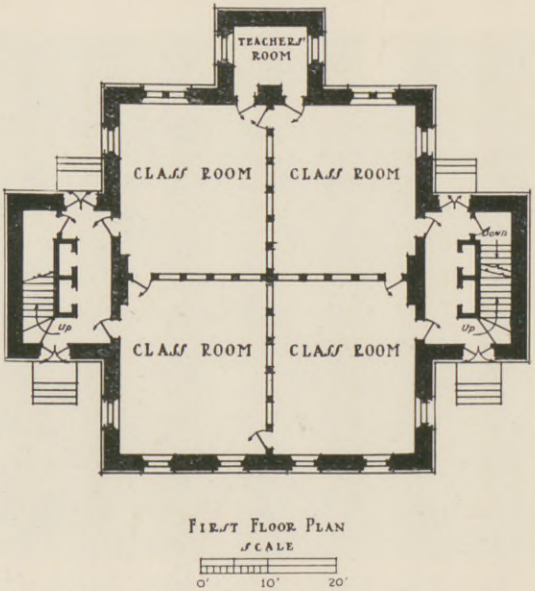


FIG. 13.—Types of school buildings, Philadelphia. Plan of type of 1870.

FIG. 14.—Types of school buildings, Philadelphia. Type of 1880.

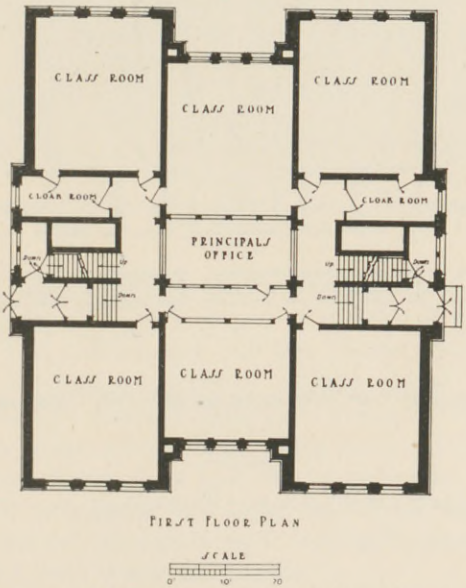


FIG. 15.—Types of school buildings of Philadelphia. Plan of type of 1880.

FIG. 16.—Types of school buildings of Philadelphia. Type of 1890.

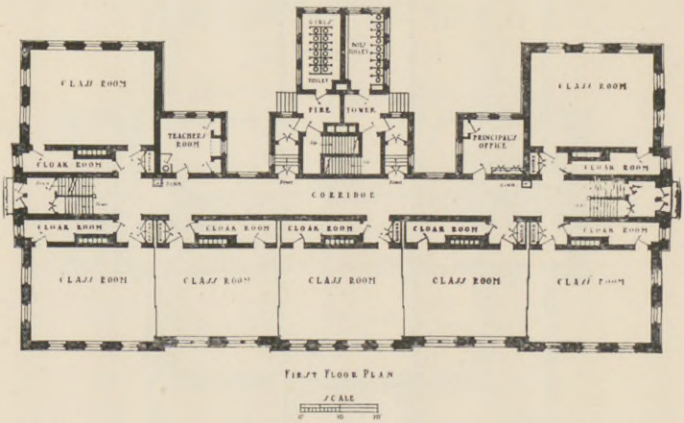


FIG. 17.—Types of school buildings of Philadelphia. Plan of type of 1890.

in an opinion and lenient. Too often well-meaning official or public organizations and committees condemn a department or an individual in public office unjustly.

It is impossible to give details of types and construction of school buildings in a book of this character. The object of this chapter is to furnish ideas on the latest approved thoughts as related to sanitation and safety. Progress in the past forty years has been slow but important. Pictures of the school buildings erected in the past century in ten- or

FIG. 18.—Types of school buildings, Philadelphia. Germantown high school, 1914.

twenty-year periods are most interesting and instructive. The old large cities have remaining and in use types of each period. The author here submits photos illustrating the progress in school construction in Philadelphia.

According to child population and available funds, authorities must modify the approved plans to suit. It is important before final approval to give due consideration to possible increase in population and added school activities.

There are two distinct types of modern fire-proof buildings. Both are approved and serviceable.

1. Wall-bearing construction, in which the support of the structure is on the walls. These are built with concrete floors but brick walls. This type is clearly shown in Fig. 19.

2. Full type column construction where weight is on concrete columns instead of the walls. There are full concrete columns and a brick facing, generally a 13-inch curtain

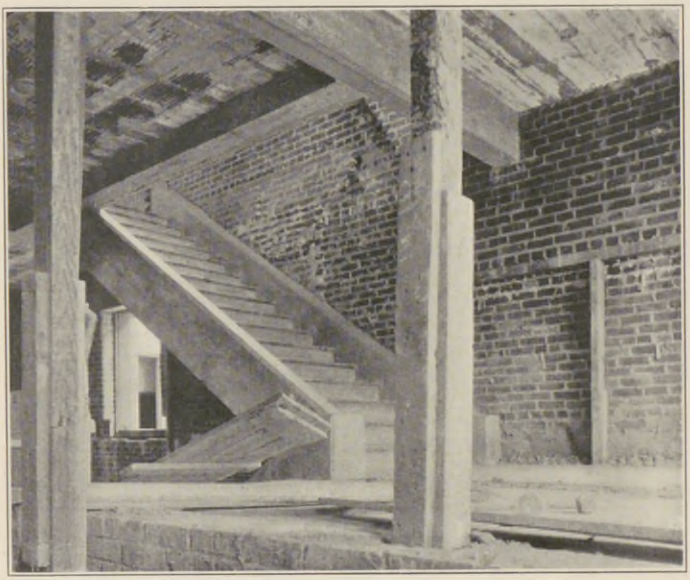


FIG. 19.—Concrete wall-bearing construction. Type 136, Philadelphia public schools.

wall. This type is more rapid in construction and more economical and is clearly illustrated in Fig. 20.

The medical inspector may profit by studying the construction and sanitation of some of those school buildings, which have ideal conditions.

Laws on Building Requirements.—It is advisable for State legislatures to enact laws which shall specify what shall

be the requirements under which new school buildings may be erected within its territory. A number of States have some provisions for such operations.

The Pennsylvania school law has the following specifications in relation to school buildings:

FIG. 20.—Full type column construction. Type 137, Philadelphia public schools.

SECTION 618. All school buildings hereafter built or rebuilt shall comply with the following conditions:

In every school-room the total light area must equal at least 20 per cent of the floor space, and the light shall not be admitted thereto from the front of seated pupils.

SECTION 619. No board of school directors in this Commonwealth shall use a common heating stove for the purpose of heating any school-room, unless such stove is in part enclosed within a shield or jacket made of galvanized iron,

or other suitable material, and of sufficient height and so placed as to protect all pupils while seated at their desks from direct rays of heat.

SECTION 620. No school-room or recitation-room shall be used in any public school which is not provided with ample means of ventilation and whose windows, when they are the only means of ventilation, shall not admit of ready adjustment both at the top and bottom, and which does not have some device to protect pupils from currents of cold air. Every school-room or recitation-room shall be furnished with a thermometer.

SECTION 621. Every school building hereafter erected or reconstructed, whose cost shall exceed four thousand dollars ($4000), or which is more than one story high, shall be so heated and ventilated that each room and recitation-room shall be supplied with fresh air at the rate of not less than 30 cubic feet per minute for each pupil, and which air may be heated to an average temperature of 70° F. during zero weather.

SECTION 622. All school buildings, two or more stories high, hereafter erected or leased in any school district of the first class in this Commonwealth shall be of the second, third, or fourth class, every building more than two stories high, thereafter built or leased for school purposes, shall be of fire-proof construction.

SECTION 623. All doors of entrance into any building more than one story high, used for a public school building in this Commonwealth, shall be made to open outward, and the board of school directors of every district in this Commonwealth shall, before the opening of the school term next following the approval of this act, change the entrance doors of every such school building so that they shall all open outward.

SECTION 624. In all school buildings more than one story high hereafter erected, all entrance doors as well as all doors from class-rooms, school-rooms, cloak-rooms or other rooms into halls shall open outward.

SECTION 625. Every school building shall be provided with necessary fire-escapes and safety appliances as required by law.

SECTION 626. The board of school directors in each school district shall put the grounds about every school building in a neat, proper and sanitary condition, and so maintain the same; shall provide and maintain a proper number of shade trees.

Site.—The site for erecting a school building requires more consideration in rural than urban districts. In rural districts the ground should be free from dampness, and if located on a hill the southerly side should be preferred, as it affords more sunlight and protection against winds from the north. Locations in level country should preferably have the corners of the building pointing north and south, thereby affording sunlight for all sides at some part of the day. In cities the location should depend upon the school population of the neighborhood, and the school so placed as to be in the center of the district. The available space should admit of ample playgrounds and be free from obstructions from adjoining high buildings. One of the most important features should be air and sunlight, which is dependent upon the plan of construction and the surroundings. Good results are generally possible with V. U. T. H. E. L. or Y. shaped buildings.

Before approving the location of a new building, those in authority should take a careful census of the district and map on a chart the number of children, the location of factories, industrial plants and railroads. Due consideration should be given to possible depopulation due to encroachments of industries, as well as increased dwellings to occupy vacant lots. Many a school has been hampered in its work by adjoining an industrial plant which later is occupied by a boiler factory doing riveting and electric drilling. The courts when appealed to abate these nuisances are not in sympathy with educational authorities who disregard the presence of industrial plants when choosing the site of a school building.

Playgrounds.—Playgrounds serve the double purpose of allowing space around a school for light and air, and furnish-

FIG. 21.—School playground.

ing the necessary means for the children to obtain exercise and pleasure out of doors. Every State should have a law

A Roof Playground.

forbidding the building of a school-house without suitable playgrounds. This may seem an unnecessary provision, as it seems scarcely plausible that a city would allow such an absurd thing as a school without a playground—yet it may occur. The size of the ground should be minimized by law. In Massachusetts it is limited to two acres; in England by rule of board, and in Germany there is required 30 square feet for every child using the school.

It would seem like economy for a city to rule that all recreation squares or parks shall adjoin a school and be connected with it in such manner as to be utilized by the pupils during school sessions, and open to the public at other times. I know of a recent example where a recreation park was built at a great expense four blocks from a school which is begging for a little yard space.

Playgrounds should be suitably equipped for play and exercise for the children. They should be paved with brick, asphalt, concrete, or some material that can be readily cleaned. If space is sufficient, part may be used for experimental gardening and part for sand-piles, etc.

Safety Against Fire.—It is not generally known, but at least 100 school-houses burn down every year. Therefore, every precaution should be taken to guard the safety of the pupils by sufficient doors in each class-room opening out into halls and on fire-escapes. Fire-proof buildings are necessary. As panic is more dangerous than the immediate effects of fire, frequent fire-drills should be held to give confidence and discipline.

Fire-escapes should preferably be located in a tower separated from the building. Smoke and flames shooting through windows around iron escapes fastened to the walls make them of little value. Interesting experiments have recently been made with chutes instead of steps for escape.

Schools should be free from accumulations of refuse and inflammable material. Galvanized cans or a special fire-proof pit should be provided to hold ashes immediately

after removal from the furnace. Ashes should be removed from the building at frequent intervals.

It is a duty of the inspector to see that fire extinguishers are of an approved make, in working order, and placed where they can be seen and readily gotten at. All extinguishers should be recharged every few months and the date

FIG. 22.—Construction of reinforced concrete stairway.

of such action marked on a tag attached to the extinguisher. Teachers and older pupils should receive instructions in the use of fire apparatus. In cities, members of the fire department should make regular systematic inspections of all schools, and recommend changes where needed.

CIRCULAR OF INFORMATION ON FIRE PREVENTION.

To the Principals:

In order to reduce to an absolute minimum the fire menace in school buildings, will you please note the following instructions and issue such directions to teachers and janitors and other persons concerned as will make these instructions effective.

1. All persons in the school should be made acquainted with the location and methods of using all appliances designed for fire protection. This applies to fire-extinguishers, fire hose, and fire-escapes in all buildings, and to sand buckets and fire blankets in domestic science kitchens and in teachers' kitchens.

The fire-blankets shall be kept on a shelf in sight and easily within reach in the domestic science kitchens, and must not be removed for any purpose except to extinguish a fire, the particular object in this case being to cover the blanket over persons whose clothing may have taken fire. No fire apparatus shall be used for any other purpose whatever, but fire-escapes shall be used for fire-drills and for frequent other dismissals of pupils in order to familiarize them with the location of the exists.

2. Fire-drills shall be held at least twice each month, and at irregular intervals.

Fire-drill signals are to be given only upon fire-gongs installed for this purpose, and not in any case upon the classroom bells. It should be noted, further, that the fire-gongs are not to be used for any other purpose whatever, and that any signal upon these gongs is a call to a fire-drill.

The school response to every fire-signal should be on the assumption of an actual fire. Children should not be allowed to delay by stopping for clothing.

Fire-drills should be held to meet all possible conditions. They should be organized for assembly periods, recess periods, and other unusual situations.

Fire-signals may be given in schools, without previous notice, by school officials and by inspectors of the department of buildings vested with this authority.

All fire-alarms shall be given without previous notice to the school.

3. In every case where fire-exits empty into constricted yard areas, exit gates from the yards must be kept unlocked at all times while pupils are in the building. In any case, where for any reason the principal of the school deems it advisable or necessary to keep any of the yard gates locked during school hours, special permission to do so must be obtained from the district superintendent, or, in the case of higher schools, from the associate superintendent in charge. Any such locked gate must be opened immediately upon the giving of a fire-alarm by a person specifically designated to perform this duty.

4. All loose paper must be baled each day. When ten (10) bales of paper have accumulated, the principal is to notify the department of supplies on the postal card form provided for this purpose. Baled paper may be collected at other times by the authorized agent of the board of education.

5. Principals are to see to it that no rags of any kind are placed in waste baskets. Oiled paper and refuse from teachers' or pupils' lunches must not be placed in the waste baskets, but must be kept in separate containers.

Dish towels, cloths or other cotton or wool material must not be hung on radiators or steam pipes for any purpose whatever.

6. No matches except safety matches shall be brought into school buildings by any person.

7. As soon as possible metal cabinets will be provided for the storage of paints, oils, turpentine, alcohol and any other materials of an inflammable nature required to be stored in school-shops; and thereafter principals will see that no such inflammable materials are otherwise stored in any part of the building.

Metal containers with hinged lids will be provided as receptacles for shavings and other waste materials for all school-shops, and care must be exercised to see that all such materials are carefully gathered and thus deposited.

Plumbing and Drainage.—An ordinary school building is supplied with water-closets, urinals, sinks, washstands, drinking fountains and boiler, making the plumbing at times intricate. The water-supply for closets and urinals may be taken from a reservoir or tank in or on the building where city water pressure is doubtful. The street mains are usually constructed of cast iron; wrought-iron service pipes bring the water-supply through the building, and iron pipes are attached to the various fixtures. All pipes should be located and protected when in exposed positions to prevent freezing in cold weather.

The arrangement of pipes and appliances for drainage, or the removal of waste water and sewage, requires care and ingenuity, as faulty plumbing may be a menace to life. A complete barrier should be interposed against back pressure working back through the pipes into the building. Traps and depressions containing a head of water are used for this purpose. Each fixture in the building should be properly trapped. Soil and vent pipes should receive special attention.

Toilets and Urinals.—The inspector should in his investigation of sanitation of building and grounds carefully inspect all water-closets and urinals; noting the location, condition of flush and ventilation, the number in relation to the school population, and the cleanliness of the room and basins. All traps and waste pipes should be effective to prevent odors. Where trough water-closets are used cleanliness and frequency of flushing should be noted. Out-houses should not be located too near class-rooms. There should be separate closets in each playground for both sexes and properly screened. Urinals should be constructed of slate or stone, properly flushed by constant running water. The slope

should be sufficient to insure against stagnant pools. Soil pipes should be large enough to prevent being easily clogged up.

Toilets and urinals in the building should be sufficient to meet the demands of the school population. They can be located in the basement or on each floor, in which case they are best located in towers isolated from the class-rooms. Drainage, plumbing and ventilation must be carefully considered. Seats should be supplied suited for the younger children.

Water-supply.—In order to determine the purity and suitability of water for household or drinking use, both chemical and bacteriological examinations are necessary. Chemical analysis shows the presence of organic and mineral impurity, such as accompanies infectious excreta from the intestines or bladder, also the presence of sewage. A bacteriological analysis shows the presence of bacteria, pathogenic or non-pathogenic. A chemical examination would show when a water is dangerous and liable to contamination from germs, and is an available safeguard even before bacteriological examinations show the presence of infection.

In country or suburban districts, one must not be deceived by the clearness of the water, especially where the supply is from a well or spring, as there is always the possibility of infection from nearby or even distant sewage.

Drinking Fountains and Cups.—In most of the large cities either by legislation or common sense, the public drinking bucket, cup, or spigot has been abolished. It has been proved to be a source of grave danger, spreading contagion that can be readily avoided. In the United States investigation shows that 25 per cent of the cities have individual drinking cups and in 75 per cent of their schools are sanitary drinking fountains. The following States have legislation forbidding the use of public drinking cups in school houses: New Jersey, Wisconsin, Michigan, Kansas, Mississippi, Oklahoma, Massachusetts, Iowa, California and Pennsylvania. There are also innumerable cities that through their Boards of Health have forbidden the use of these cups.

The following is a statute in the State of Massachusetts:

AN ACT.—To Restrict the Use of Common Drinking Cups. Be it enacted by the Senate and House of Representatives in General Court assembled, and by the authority of the same as follows:

FIG. 23.—Type of sanitary drinking fountain installed in schools by placing bubbling-cups on old fixtures.

SECTION 1. In order to prevent the spread of communicable diseases, the State Board of Health is hereby authorized to prohibit in such public places, vehicles, or buildings as

it may designate the providing of a common drinking cup, and the board may establish rules and regulations for this purpose.

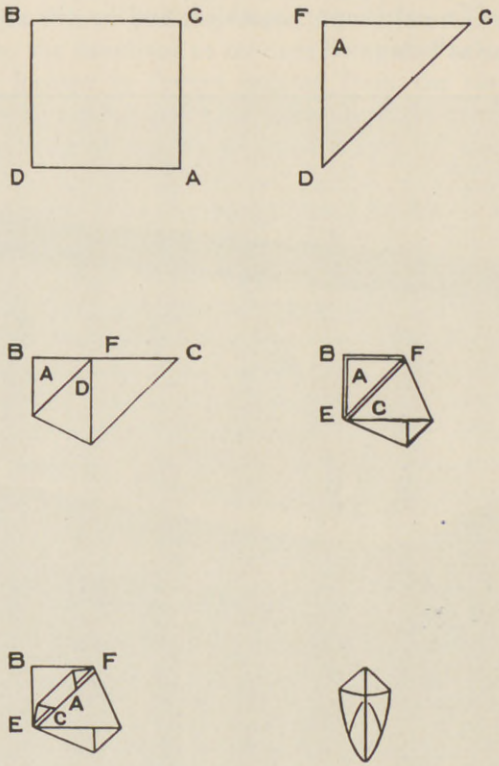


FIG. 24.—Individual cups made from squares of paper; easily taught to the children.

SECTION 2. Whoever violates the provisions of this act, or any rule or regulation of the State Board of Health made under authority hereof, shall be deemed guilty of a misdemeanor and be liable to a fine not exceeding $25 for each offence.

SECTION 3. All acts and parts of acts inconsistent herewith are hereby repealed.

SECTION 4. This act shall take effect on the first day of October, 1910.

Where children must drink from the ordinary spigot without the aid of a cup, and the school authorities cannot be induced to install a sanitary drinking fountain, the safer plan is to turn the outlets up so that the water is forced up and flows down over the opening. However, there is a very cheap sanitary arrangement that can be attached which replaces the old faucets. This arrangement, shown in Fig. 23, page 135, has been successfully tried out in Toledo's schools. It consists of a small glass cup with automatic cut off from which the child can drink without his lips touching the glass. Many different makes are marketed at various prices, but all are designed on the same principles.

Since the abolishing of the public drinking fountains and cups in several States and many cities, there have been placed on the market numerous inexpensive paper cups made of a heavy bond or paraffined paper. Fig. 24, page 136, shows some of these individual cups, also a simple method of making a cup from a square piece of paper. The pupils can readily be taught how to make such cups and encouraged to use them on all occasions.

Class-rooms.—Class-rooms should be large and cheerful and should seat not more than 45 pupils to a room. The air space should be such as to allow not less than 200, and if possible 300 cubic feet per child. Children are compelled to live five hours every day in these rooms, and it should not only be made inviting, but serve as an object lesson for healthful home living. Faulty lighting, ventilating or seating may directly cause many of the defects found among school children, and the school physician must be sure that school conditions are not responsible for the defects diagnosticated.

Lighting.—Class-rooms in most buildings are lighted from three of the four points of the compass. The side not desired

is the one giving no sunlight in winter. The east and west rooms are more desirable when it is only possible to use two sides. The amount of window area should be about one-fifth of floor space. Windows should not extend too near the floors, as the very low part is of little practical value.

Natural lighting of sufficient amount and properly related to the seating is essential to the health and comfort of the occupants of a school. In a number of States, the legislatures have specified the minimum amount of window area in relation to existing floor area. Climatic conditions and location with or without surrounding obstructions make the value of this factor variable. Excessive light is impossible but glare may be a problem.

Artificial lighting is not merely to meet an emergency on dark days, but the possible existence of a night school or evening parent meetings. In cities gas and electricity are available. The expense of electricity is often no greater than gas and more effective. Small gas plants are possible for rural schools. The fixtures with their accessories and construction is an important problem. The systems employed are direct, indirect and semi-indirect according to the method of reflecting the rays. The semi-indirect which diffuses light through a translucent bowl and also reflects light to the ceiling to again be reflected is the most effective system.

The following are standards for artificial lighting submitted by the Illuminating Engineering Society.

	Minimum foot candle power at place of work.
Class-rooms	3.0
Shops	3.5
Sewing and drafting-rooms	5.0
Gymnasium	1.0
Auditorium and assembly	1.5
Stairways and corridors	0.5

To the author these standards seem rather low. It is beyond the scope of this book to detail the kind of fixtures, number for a given space and the placement, but a few

suggestions are offered to aid in solving the problem. Electricity is more desirable than gas, but where electricity is not available use of modern Welsbach lights assures good lighting.

The bulbs or mantles should vary in height from 7 to 9 feet from the floor according to the candle power or wattage of

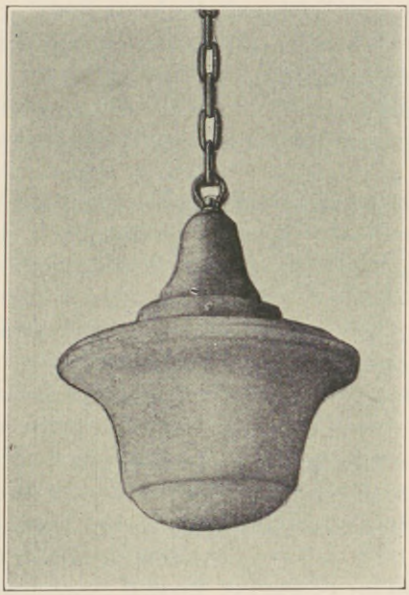


FIG. 25.—Celestialite, an effective lighting unit.

the bulb. A strong bulb should be 9 feet high. More effective lighting is obtained from one lamp of 250 watts than a cluster of five, 50 watts, as in the latter case much of the light is lost before reaching the desks. Lack of this knowledge and a false conception of economy often prevents efficient lighting. Tungsten lamps are more effective than carbon.

No small amount of success is due to the kind of auxiliary globe used. On this depends whether the light is direct,

indirect or semi-indirect. A globe which has been successfully used in many schools, auditoriums and public buildings is here illustrated (Fig. 25). It is termed "Celestialite." It is so designed as to be dust-proof and the maximum rays directed down. The globe has three layers—a clear crystal to provide body and strength but no absorption of light; an inner light rectifying layer of blue glass; a middle translucent layer to evenly diffuse the light and eliminate glare.

Etching and fancy designs decrease the light efficiency and add to the difficulties of keeping clean. The maintenance of lighting fixtures is too often neglected. Dull bulbs should be replaced; broken mantles removed; globes kept clean.

Lockers and Closets.—Where lockers and closets cannot be located in the basement, arrangements can be made to place them alongside of class-rooms, with entrance from halls as well as rooms. A sufficient number of hooks should be provided to allow a separate hanger for each pupil. Where possible it is preferable to have separate lockers for each pupil.

Cleanliness.—Cleanliness of school buildings from the viewpoint of the school inspector includes the absence of refuse, the dusting of rooms and furniture, and the cleaning of floors and playgrounds. Janitors, who depend upon political favor for their appointment are often very negligent in performing their duties. To inquire whether these caretakers use damp cloths for dusting, a vacuum cleaner, or a dust-absorbing compound is of little importance. The question to solve is how often they use these implements and with what efficiency. An investigation of 1038 cities by the Child Hygiene Department of the Russell Sage Foundation showed that 643 claimed to use damp cloths for dusting, 894 dust-absorbing compounds, and 87 cities employ vacuum cleaners. However, the floors were washed and swept and windows cleaned at varying intervals. The most common practice seems to be once a month, often once in three or five months, and in some cities once a year.

Inspection for cleanliness should not be confined to annual or biennial visits, but should be done frequently and always at a time unexpected by janitors. Observe conditions of cellars, toilets and playgrounds. In recording presence of dust, due allowance should be made for old dilapidated buildings where floors and walls create excessive dust from wear.

Dust is harmful because it acts as an irritant to the mucous membrane, and assists in spreading infection. Every means should be employed to prevent its accumulation, and dissipation through the air. Dust may be lessened in schools by proper sanitary method of cleaning, requiring pupils to wipe their feet before entering building, and using moist erasers for blackboards. Old floors can be oiled with advantage.

School Furniture.—The relation of school furniture, desks and seats, to spinal curvature is briefly told in the chapter on "Orthopedic Defects." It emphasizes the great need for desks and seats built on scientific principles and the proper seating of school children. Dr. James Warren Sever, of Boston, has studied this important problem in the schools of the United States. He addressed inquiries to 230 school departments in cities with 250,000 population and over. Tabulated answers from 38 per cent of these cities showed the following points of interest.

1. The almost total lack of uniformity of cities toward installation of adjustable furniture.

2. The large number of cities in which only a small percentage of the total equipment is adjustable.

3. The use of the single desk and chair in place of the older form of double desks with settees and benches.

4. The uniformity of the two types of adjustable furniture, namely, (A) The separate chair and desk (B) The automatic with settee seat.

The inadequacy of the first type of chair back (No. 4 [A]) and the faulty design of (No. 4 [B]) cause bad attitudes

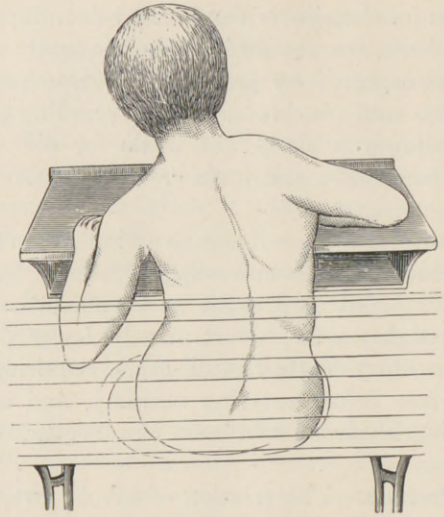


FIG. 26.—Position assumed in writing with the desk too high. (Pyle.)

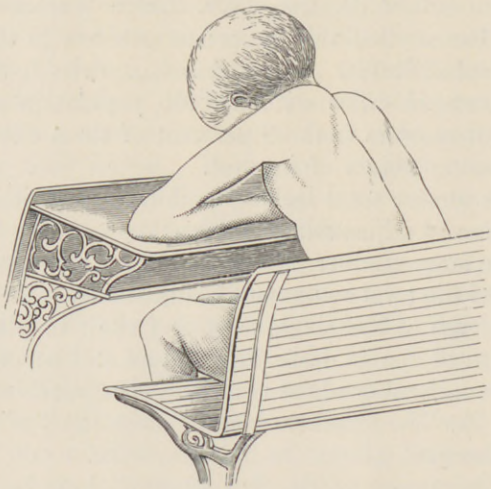


FIG. 27.—Position assumed in writing with the desk too low. (Pyle.)

and must be uncomfortable. The seats slope too deeply backward, the backs vary considerably, and give support in the wrong place. The accompanying illustrations show the varieties of furniture most frequently used in the schools of the United States, and point out the good and bad features

FIG. 28.—Moulthrop desk, showing correct posture.

of each. The illustrations were furnished by N. Snellenburg & Co., Philadelphia, distributors for the American Seating Company.

While most of the large cities have installed some modern furniture, most of the rural districts still use benches that have the back and seat fastened to the desk behind, and in

many places children are seated in ordinary kitchen chairs, or benches with no support for the back.

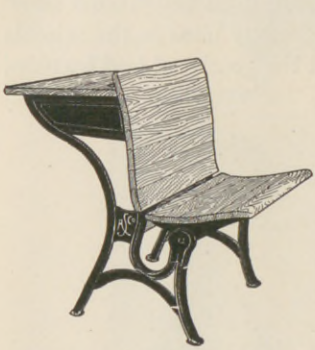


FIG. 29

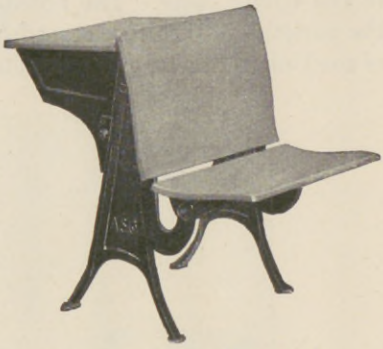


FIG. 30

FIGS. 29 and 30.—Desks and chairs, stationary and non-adjustable.

FIG. 31.—Adjustable desk and chair of steel; good type, but back of chair could be improved.

There are on the market about 200 models of desks and chairs, most of which are poorly constructed, that give

either a faulty support to the back or none at all. The child is adjusted to the furniture and not the furniture to the

FIG. 32.—Moulthrop chair and table suited for some special classes.

FIG. 33.—"Universal" a new type of steel adjustable furniture; chair and desk attached and movable.

child. In most of the seats it is impossible for a child to assume a comfortable and correct posture. Desks and chairs

cannot be chosen for children according to grade in school or age of child. The height of the child must be the only consideration. This requires adjustable furniture. The

FIG. 34

FIG. 35

FIGS. 34 and 35.—Some types of adjustable desks and chairs.

desk and chair must not be too high or too low, nor too near or too far from each other.

School desks must be adjustable to height, and there should be sufficient room below for the knees. It should be low enough for the elbow and forearm to rest comfortably on the desk without bending the back. The feet should rest

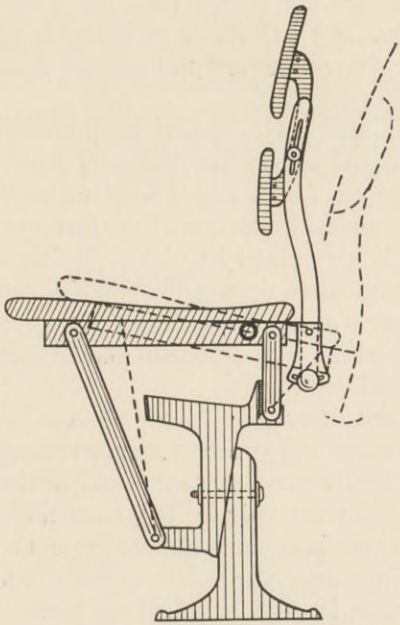


FIG. 36.—Adjustable school seat.

flat on the floor and not dangle or be forced above the seat. The top should slope at an angle of 10 to 15 degrees, which will be comfortable and yet not allow the papers to slide off.

The seat should be no wider than the hips, in depth two-thirds the length of the thigh, and should slope only slightly backward. The front edge of the seat should be about 1 inch behind the front edge of the desk. The construction

of the back of the chair is very important and should slope very slightly backward and support the spine in the lumbar region in all positions of the child. Any support above the hollow of the back is unnecessary, and tempts sloughing positions. Desks and chairs adjustable in all directions are complicated, require considerable care, and have no special advantages. The chair may have one or two cross-bars, providing they are not higher than the lower part of the shoulder blades. An adjustable cross-bar is an advantage, and should be convex forward and concave from side to side to fit the lumbar curve.

Single desks and chairs should be preferred. Benches, kitchen chairs, and settees are distinctly bad.

At the beginning of each school term the medical inspector should make a careful inspection of the furniture as adjusted to each child in the school he visits. He should also urge frequent rest periods to protect the children against fatigue. Most cities have some arrangement for physical exercise for the pupils, which is a most valuable adjunct in the prevention of spinal deformities.

Ventilation and Heating.—Today no one questions the necessity of proper and effective ventilation of our schools and homes to insure comfort, health and efficiency at work. Pure safe air must not only be free from impurities but it must contain a certain amount of moisture and be maintained at an even temperature and one to assure comfort.

The quantity of fresh air required per individual has been scientifically and accurately estimated and laws in numerous States specify the quantity of space and air which must be allowed per person in schools and public buildings. An exhaustive study of the contamination of air in school-rooms, the physiological process of breathing and its effect in enclosures, the relative and absolute humidities, and numerous other associated problems need not be discussed here. It is sufficient to note that the purity of air depends directly on the efficiency of the method used or the installation which

controls the entrance of fresh air and exit of the foul or vitiated. This process is called ventilation. It is indirectly affected by the experience and capabilities of the engineer or others in charge of ventilation.

Methods of ventilation have a wide variation from the mere opening of windows to the ultra-scientific systems such as the Carrier Air Washers and Humidifiers. One of these systems has been highly developed by the Buffalo Forge Company, see Figs. 39, 40 and 41, pages 153, 154 and 155.

There are many scientific instruments devised for measuring air, its purity and efficiency of ventilation. A method of evaluating ventilation and recording results is the "Synthetic Air Chart" devised by Dr. E. Vernon Hill, see pages 150 and 151.

TABLE IX.—SPECIFICATIONS OF USUAL AIR SUPPLIED PER PERSON.

	Cu. ft. per min.
Hospitals (ordinary)	35 to 40
Hospitals (epidemic)	80
Workshops	25
Prisons	30
Theaters	20 to 30
Meeting halls	20
Schools (per child)	30
Schools (per adult)	40

Humidities Required.—Ordinarily the humidity control should be set to maintain a saturated temperature of the air leaving the washer, between 40° and 50° F., depending upon the humidity desired in the building.

The following is a schedule of relative humidities corresponding to different saturation temperatures with room temperatures of 65° and 70° F.:

Saturation temperature leaving washer.	Relative humidity at 65° F. room temperature, per cent.	Relative humidity at 70° F. room temperature, per cent.
35°	52	27.5
40°	40	33.0
45°	49	41.0
50°	58	49.5
55°	78	59.0
60°	83	71.0

The Synthetic Air Chart.—This chart is designed as a convenient method of recording data and arriving at a final percentage of perfect ventilation. It serves as a standard, or measuring "stick" as it were, for determining the efficiency of a ventilating equipment, and eliminates personal opinion and guess work. The chart includes all of the known factors that influence the ventilation of a room. They are as follows: Temperature and humidity, which are recorded as the wet bulb difference; dust, bacteria, odors; air supply and distribution as measured by the CO_2 content. These factors, furthermore, are each given their appropriate weight or value as a part of the whole. If all the factors are ideal the percentage as shown by the chart will be 100. If all or any one of the factors represent conditions that are not ideal the final percentage will be reduced in a corresponding amount.

After the results of a test are plotted on the chart we can see at a glance the final percentage of perfect, and if the results are not what they should be the factors that reduce the final percentage are at once determined. The longer the test-line in any column the less favorable are the conditions represented. When the test-line disappears conditions are perfect.

Under each factor there are three columns, a plus per centage column; the factor column proper, and the minus percentage column. The factor column proper is divided into appropriate units of measurement, as degrees for temperature, particles per cubic foot for dust, colonies for bacteria counts, etc.

The plus percentage is the percentage of perfect for the specific factor in the column; for example, in the chart shown in Fig. 37, the dust count is 5000 particles per cubic foot. This gives a plus percentage of 98, meaning that so far as dust is concerned the air is 98 per cent free.

Reading the minus dust column we find the percentage as a part of the whole chart is only 0.5 of 1 per cent. This 0.5 of 1 per cent, together with the other minus percentages

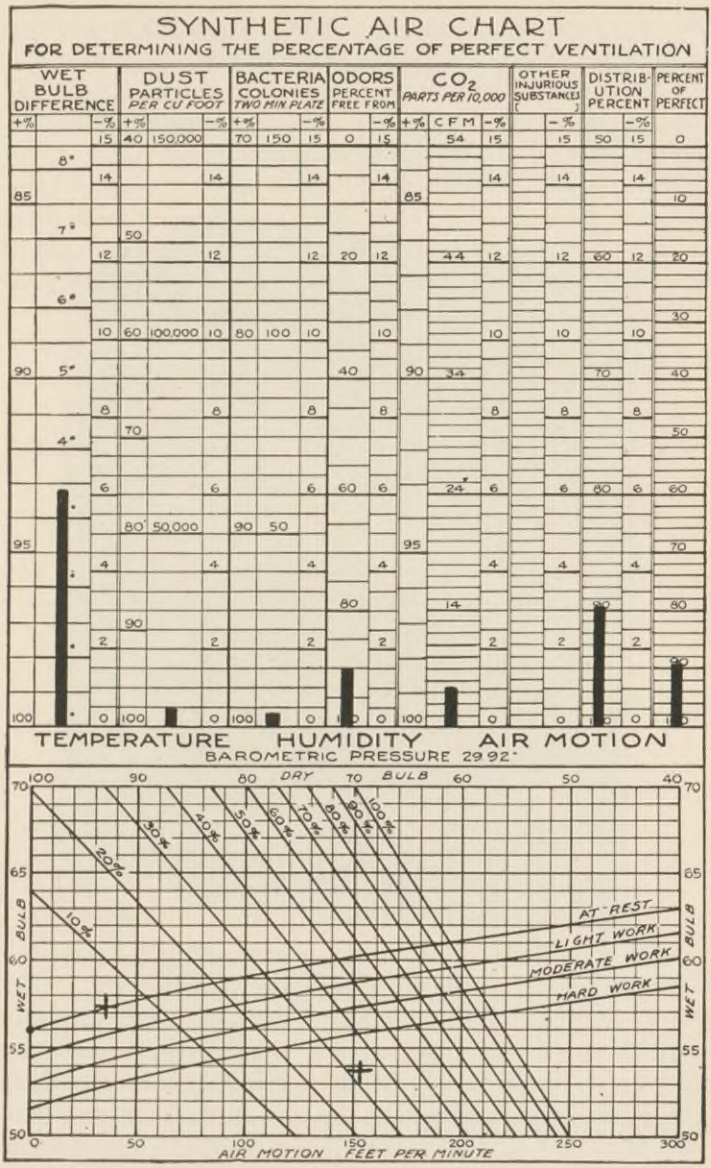

SYNTHETIC AIR CHART
FOR DETERMINING THE PERCENTAGE OF PERFECT VENTILATION
WET BULB DIFFERENCE
DUST PARTICLES PER CU FOOT
BACTERIA COLONIES TWO MIN PLATE
ODORS PERCENT FREE FROM
CO2 PARTS PER 10,000
OTHER INJURIOUS SUBSTANCES ( )
DISTRIBUTION PERCENT
PERCENT OF PERFECT
+% −%
CFM
TEMPERATURE HUMIDITY AIR MOTION
BAROMETRIC PRESSURE 29.92"
DRY BULB
WET BULB
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
AT REST
LIGHT WORK
MODERATE WORK
HARD WORK
AIR MOTION FEET PER MINUTE

FIG. 37

from the various columns, is deducted from 100 in arriving at the final percentage for the entire test.

The curves at the bottom of the chart headed "temperature, humidity and air motion" are for determining the wet bulb difference. To do this proceed as follows:

Mark a point on the curve indicating the wet bulb temperature determined by test. This point should be located at the intersection of the wet and dry bulb lines. This is done as a matter of convenience, as the point will then give the wet bulb, the dry bulb and relative humidity.

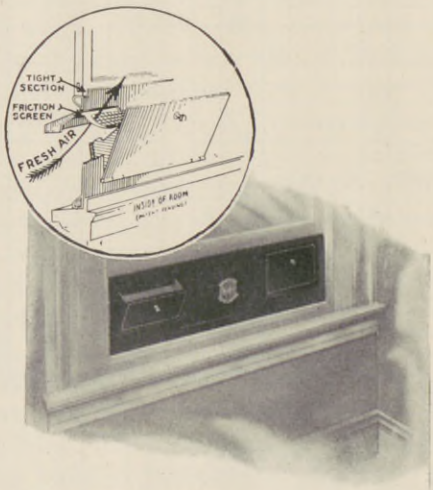


FIG. 38.—Removable window ventilator.

Next mark by a point on the line denoting the physical state of the occupants, the air motion from the test. This point will be at the intersection of the appropriate physical state curve designated by "at rest," "light work," "moderate work" and "hard work" with the vertical line of air motion. The vertical distance between the two points is the wet bulb difference, that is, it is the variation in degrees between what

the wet bulb should be and what it actually was by test. This wet bulb difference is plotted in the first column of the chart.

The distribution factor is the percentage of distribution in the room. It is determined by an analysis of the air

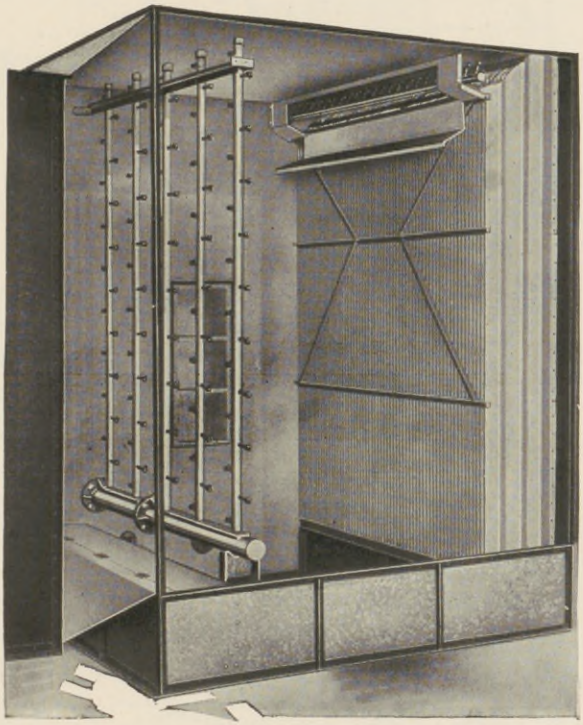


FIG. 39.—Carrier Type "A" air washer with side and distributing plate removed to show interior construction.

samples at various points for CO_2 and the average of all samples taken is the average distribution for the room.

The percentage of distribution is the percentage of variation of the different samples from the average.

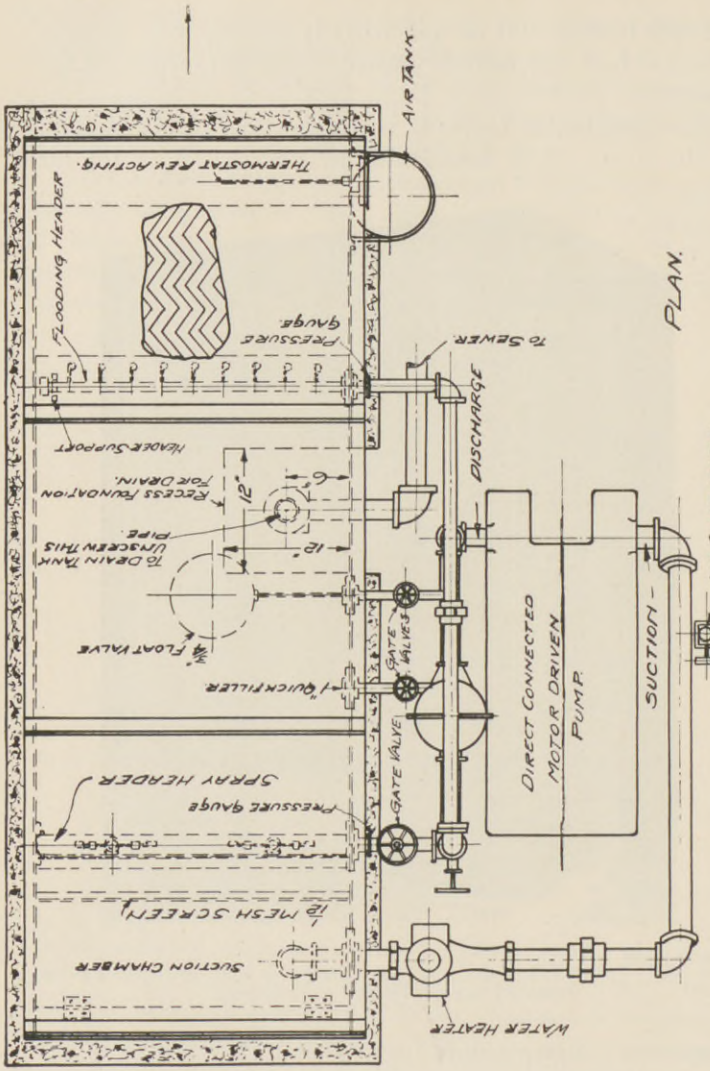
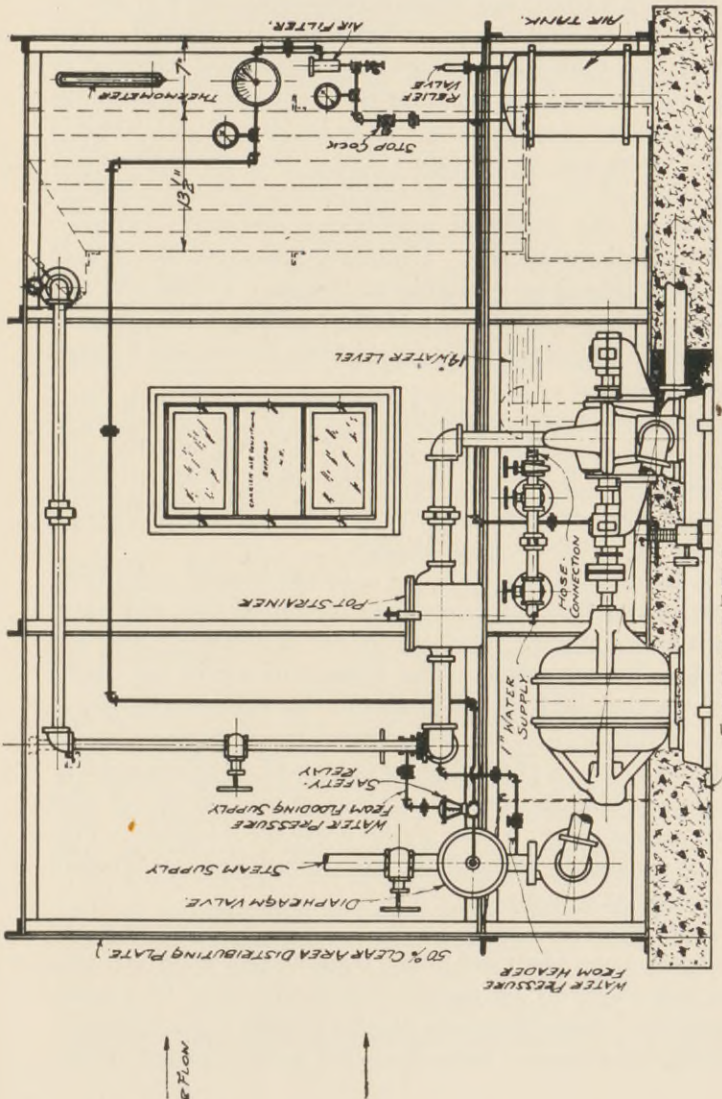


Fig. 40.—Carrier type "A" air washer with humidity control.



ELEVATION.

FIG. 41

In old buildings where there is no system of ventilating, fresh air can be admitted through the windows without a draught by a board and screen arrangement, see Fig. 38.

Ventilation may be (1) natural or (2) artificial. One should also consider an "internal" ventilation referring to the ventilating of the buildings and "external" or the diffusion of the atmosphere around the building. The latter is rarely taken into consideration, but of primary importance. The width of the streets, and the distance between buildings as well as the height of neighboring structures influence the atmosphere outside. Drainage, sewerage, refuse and decaying animal or vegetable matter may vitiate the surrounding air as well as that of the building. This is so in ventilation where the air is forced from the outside through the building.

Direct or natural ventilation is due to (1) the action of winds, and (2) diffusion of gases of unequal densities and temperature. Buildings receive the effect of these forces through open windows, doors and chimneys, and through porous structures or loose fittings.

In the artificial methods, air is forced through a building by means of fans. This air may be heated over hot-water pipes or by steam. The impure air is removed from the building by extraction. The column of air in the outlet or extraction shaft is set in motion by various systems of heating the air, and can be increased by creating a vacuum in the upper part of the flue by the use of ventilating cowls. Care must be taken that the process of heating the air does not produce a dry, hot air by lowering the humidity. This can be avoided by humidifying the air with live steam before it reaches the rooms.

Ventilation has always been a vexing problem that has produced many ideas and plans, some simple, some intricate, but practically all are imperfect from one cause or another in practice. Some prefer the plenum system, others a gravity system, but whatever the system it is to some extent depen-

dent upon the janitor for regulation, and therefore requires some intelligence and skill and most important, common-sense. It must also be borne in mind that the thermometer is not the only gauge to ventilation and heating, as humidity plays an equally important function. These are phases which at present are being investigated, and not as yet thoroughly understood. It remains, however, to be said, with our present knowledge of ventilation, nothing can surpass the direct ventilation from open windows. There should be a complete change of air every eight minutes. A class-room for 42 pupils should be 20 by 30 feet, with a ceiling height of at least 12 feet, and in buildings with little open space around them a 15-foot ceiling is more desirable.

Heating, closely allied to ventilation, is a serious problem in the schools. The ancient coal stove cooked the child nearest to it on one side and froze him on the other, while the other pupils experienced varying degrees of discomfort. Direct hot air from furnaces was almost as insanitary. More modern heating plants which take fresh air from the outside and force the heated air through radiators, automatically controlled, are more desirable.

There is little doubt that not only the temperature of the room but the amount of vapor or humidity affects the grade of scholarship. Every class-room should be equipped with a thermostat and a thermometer, which should be critically observed by the medical inspector at frequent intervals. The inspector should never take the opinion of a teacher as to the effectiveness of the ventilation and heating, for the reason that people working in a room become accustomed to odors and unconscious of ill-ventilation. In his records, the physician should calculate the amount of cubic space allowed each child in a class-room, and each room should be estimated separately, noting the size and efficiency of inlets and outlets to the system. The inlet can be told from outlet by watching the direction of a candle flame held before the opening. There exist instruments (anemometers) for the pur-

pose of measuring the velocity of ingress or exit of the air, which are valuable where a scientific study is being conducted.

The inlet should be located a few feet above the floor and should cause no unpleasant draughts or dust. Outlets should be as high as possible and close to the ceiling. The relation of inlets and outlets should be such as to cause the air passing from one to the other to mix with the atmosphere.

The temperature of class-rooms should not be allowed to go above 68° F. during days when the building is artificially heated. A temperature of about 65° F. is to be preferred, as the mind and body seem to work better at this figure. Thermometers should be placed about 4 feet above the floor and not against walls or partitions that admit of radiation and false readings. When the pupils are at recess, the windows should be opened wide if it does not disturb the system of ventilation used.

The relative humidity of a school-room should be near 50 per cent, and should not be allowed to drop below 40. The complaint of teachers to window or wall sweating is erroneous, as it is an advantage in many cases. Rooms where no air currents exist, are sure to be hot and dry. These air currents are necessary both in winter and summer.

The types of heating are: 1. Direct such as radiation from stoves. This is rarely installed today except in villages where one or two rooms are used and no basement exists.

2. Gravity has hot air emanating directly from a heater to the rooms through flues, pipes and conduits.

3. Direct through radiators heated by steam under pressure or circulating hot water.

4. Semi-direct has openings to the outside air placed back of the radiators. In these cases the cold fresh air is automatically drawn in and over the heated radiating surface.

5. Direct-indirect, where a combination of types 3 and 4 exist in the same room or building.

6. Blower type, where rapidly driven fans draw the fresh

air from the outside and through the heating system into pipes and conduits through the building. The blower type may be equipped with (*a*) filters which may be a screen of burlap or other material for the purpose of removing dust and other foreign matter sucked in by the fans. (*b*) Washers which use a curtain or chamber of sprayed water to accomplish filtration of the air. This is the system here illustrated by the Buffalo Forge Company, see pages 153, 154 and 155.

The plenum system is that part of a blower which is added to a plant to furnish under pressure a stream of air sufficient to cover all parts of a large room like an auditorium, assembly or gymnasium.

SCHOOL HOUSEKEEPING.

Equally as necessary as in the home or any large institution, efficient housekeeping is required in the schools. Millions of dollars worth of property are entrusted to janitors, teachers and principals, with more or less efficiency exercised. With an object of systematizing and increasing the care of public property, Philadelphia inaugurated in 1923, a Good Housekeeping Department. There are many functions assigned to it which cannot be handled by health supervision but which directly affects the health and safety of those using the buildings.

The importance of this work warrants reprinting the major part of a valuable manual of instructions supplied to each school in Philadelphia.

I. General Instructions.—1. The principal of each school is The Board of Public Education's responsible executive officer for all activities taking place within the building and for the building itself. It is, therefore, his responsibility to see that the janitor is informed of, and complies with, the instructions outlined in this manual. The principal shall include in his monthly report to the Department of Superintendence a statement of the condition in which the school

plant has been maintained, from the point of view of the general operation of the plant, safety, and comfort of the pupils and teachers, and the care of the school property.

2. The janitor of the school building is the custodian of the Board's property entrusted to his care. As such it is his duty to use all reasonable care and precaution to protect the building and other property placed in his charge, in order to conserve the interests of The Board of Public Education. He is to be governed by these printed rules and regulations, by the instructions of the principal of the building, and also by his own judgment as to necessary procedure in cases not covered by this manual. He is to exercise the same care of the school's property as though it were his own.

3. Janitors and their helpers shall register the time of their arrival and departure.

4. Janitors shall have the school gates open at least thirty minutes before the time fixed for the sessions to begin. Pupils shall be permitted to enter the building at least fifteen minutes before the beginning of the morning session and at least ten minutes before the beginning of the afternoon session; provided that in case of inclement weather the pupils shall be permitted to enter the building as soon as the gates are open.

5. On all days when schools are not in session, janitors shall be at the school buildings between 9 A.M. and 5 P.M., except on Saturdays, when they shall be present between 9 A.M. and 12 noon. They shall be present at 7.30 A.M. on days when workmen are engaged in the buildings. They shall not be required to be present on Sundays nor on legal holidays.

Nothing contained in this instruction relieves the janitor from being present at the building when exceptional weather or other conditions require his attention to prevent damage to property.

Janitors shall not absent themselves without first obtaining permission from the Superintendent of Buildings. In

case of illness or other disability, janitors shall immediately notify the Superintendent of Buildings.

6. The name and address of the janitor of each building shall be displayed in a conspicuous place upon the building and in such a manner as to be easily read from the curb of the street. The name and address of any person substituting for an absent janitor shall also be so displayed.

7. Janitors shall not remove nor permit to be removed from the school building or the school yard any property belonging to The Board of Public Education, except on a written order signed by an official of the Board.

8. The telephones placed in school buildings are for the transaction of school business only. When schools are not in session the janitor shall see that the use of the telephone is confined to such purposes. This instruction does not apply in the case of pay telephones.

9. Whenever school property requires immediate attention, the principal shall notify the Department of Buildings by telephone, except in matters relating to the mechanical plant, when it shall be the duty of the janitor to so notify the Department of Buildings by telephone, and to inform the principal immediately. All such telephone reports must be immediately confirmed in writing by the principal. All matters of imperative necessity, other than those in the nature of an emergency, shall be reported to the good housekeeping inspectors on their visits to the building.

10. Classrooms shall be vacated by teachers and pupils thirty minutes after the dismissal of school. In exceptional cases where it is necessary to occupy rooms later, special permission to do so shall be obtained from the principal, who shall inform the janitor that such permission has been granted.

11. Principals, teachers and janitors shall be particular to see that no person wastes water; they are expected also to aid in the conservation of fuel. When mechanical ventilating systems are in operation, doors, windows and tran-

soms shall be kept closed. In all buildings, teachers shall close doors, windows and transoms at the close of each session. Janitors shall follow carefully the detailed instructions outlined in Appendix A.

12. Due economy and care shall be exercised in the use of electric current. It is so easy to press a button and light a classroom or a corridor when the illumination is dull, and to forget that the lights are burning when the natural illumination becomes sufficient. Some class-rooms require artificial illumination even on bright days, but care must be exercised to discriminate between such rooms and those where natural illumination is sufficient.

Teachers shall switch off the lights in their respective class-rooms when classes have been dismissed.

Janitors shall use care and judgment in the burning of electric lights at times when school is not in session, and see that their helpers have lights burning only when needed and only in such rooms as are being cleaned at the time.

13. As winter weather approaches, to prevent freezing and resulting damage to school property, the water supply shall be shut off at night, on Sundays, and on school holidays. Pipes of filters, water closets, and other fixtures shall be drained. Outside drinking fountains, urinals and latrines shall be shut off at all times during freezing weather, except during recess, when they are to be turned on for drinking and flushing purposes. Openings around window sash, frames, or doorways that may permit cold air to strike a water pipe or a return pipe of steam heating apparatus shall be closed with paper packing.

14. Each teacher shall record daily, on the chart provided, the temperature of the class-room. The charts for the school are to be filed in the principal's office at the close of each month, and are to be made available for the use of the good housekeeping inspectors on their visits to the school.

15. Janitors shall raise the national flag before 8.30 o'clock every morning, and take it down between 4 and 5

o'clock in the afternoon of every day that the schools are in session. They shall do the same on all national, state and municipal holidays.

II. Fire Protection. Safety of the Children and Other Persons in the Building is the First Consideration.—16. Fire-drills shall be held at least twice each month and at irregular intervals. The purpose of a fire-drill is to insure the safe, quick and orderly exit of all persons from the building. Since the health of the children must be safeguarded in cold and inclement weather, pupils occupying home class-rooms shall be trained to get their clothing as a part of each fire-drill.

17. In each building the principal, teachers and janitor shall be made acquainted with the location and methods of using all appliances designed for fire protection. Each day before pupils are admitted into the building, the janitor shall test the fire-gong system and immediately report any defect to the principal.

18. The school response to every fire signal shall be on the assumption of an actual fire.

19. The fire signal is any ring on any fire-alarm gong. Class-room bells shall not be used for fire signals. Fire-gongs shall not be rung for any other purpose. Teachers, clerical assistants and janitors shall be made familiar with the methods of sounding an alarm. Occasionally the principal should arrange with a teacher to sound an alarm on the nearest gong. This alarm is the signal for a general alarm to be sounded instantly from the office.

20. After the organization of the fire-drill for a new term, the fire signal shall be rung without previous notice to teachers or pupils. The fire signal may be sounded by the principal, teacher, clerical assistant, or janitor.

21. Pupils discovering fire shall report instantly to the nearest official—principal, teacher, clerical assistant, or janitor.

22. When the fire-gong sounds, all pupils are to stop work instantly and proceed as directed. They shall be trained

to observe *absolute silence* during the entire drill. *Good order is more important than speed.* Principals shall provide for a variation of the regular procedure by occasionally closing a certain exit or exits, thus anticipating conditions that might arise in event of an actual fire.

23. In passing to and from exits, lines shall not pass each other. Pupils shall pass down fire-escapes or stairways in double file. Each child must use the handrail and be prepared to render assistance to anyone who may stumble or fall.

24. Teachers and pupils shall pass from exits to assigned places in yards or streets and remain there in order until directed to return to the building or to disperse.

25. Principals shall assign teachers, janitors and responsible pupils to stations for fire-drills, and shall specifically assign responsible pupils to see that exit doors are kept open until the last pupil has passed through.

26. Principals shall make special provision for the safe removal and care of pupils handicapped by physical or other defects by assigning teachers, janitors, or larger pupils to this duty.

27. Detailed plans for fire-drills conforming to these instructions shall be submitted by the principal of each school to the district superintendent. Upon approval the procedure pertaining to each room shall be posted in a conspicuous place therein, and all pupils occupying such room shall be made familiar with the same. In these plans provision shall be made to meet conditions that may arise while pupils are at assemblies, recesses, or in any unusual situation.

28. Each district superintendent shall discuss at least once a year in a principals' meeting the regulations for fire-drills and the measures to be taken to meet the fire hazards of the schools. It is desirable that a good housekeeping inspector should be present.

29. Immediately upon the discovery of a fire, after sounding the fire-gong the principal or clerical assistant shall

telephone Spruce 20, and report the fact, and a person specially designated shall sound an alarm from the nearest city fire-alarm box. The key to this box shall be located in a prominent and accessible place in the principal's office, properly labelled, and with the location of the box designated. Where a key is provided at the box, this fact shall be displayed in a conspicuous place in the office.

Other Fire Precautions.—30. Fire-escapes shall be used for frequent other dismissals of pupils, as well as for fire-drills, in order to familiarize them with the location of the exits. Fire-blankets shall be kept on a shelf in sight and easily within reach in the domestic science kitchens, and shall not be removed for any purpose except to extinguish a fire, the particular object in this case being to cover the blanket over persons whose clothing may have taken fire. No fire apparatus shall be used for any purpose except to extinguish a fire.

31. Fire-escapes, fire-towers, yard gates, entrances and approaches thereto shall be kept free of obstructions and clear of ice and snow, and be kept open at all times during the occupancy of the building.

32. Janitors shall frequently inspect the nozzles of fire extinguishers, and if stopped up shall ream them out.

33. Water tanks in attics shall be kept filled at all times. When city water pressure is insufficient the pumps shall be used.

34. Fire-hose shall be tested by the good housekeeping inspectors during the month of June.

35. Sweepings, refuse, greasy rags, greasy paper, and the remains of lunches shall be consumed in the furnace each day. All other waste paper shall be baled before the close of each day. The bales shall be kept in a cool, dry place, away from cellar windows, and apart from any other material.

When, in fire-proof buildings 10 bales of paper, and in non-fire-proof buildings 5 bales of paper have accumulated, the principal is to notify the Department of Supplies on the postal card form supplied for this purpose; provided, how-

ever, that baled paper shall be removed at least once in every thirty days from each building. All waste paper shall be removed from each building at the close of the school year.

36. Inflammable materials shall not be allowed to accumulate in cellar window areas, entrances to ventilating systems, on ash heaps, or in floor registers.

37. Teachers shall see that no rags, waxed, or greasy paper, or refuse from teachers' or pupils' lunches are placed in the waste baskets. Such materials shall be placed in separate containers.

38. Paints, oils, turpentine, alcohol, and other inflammable liquids shall be stored in metal cabinets provided for the purpose. When containers have been opened, corks or stoppers shall be properly replaced. Rags or waste shall not be used for stoppers.

Other school supplies of an inflammable nature shall be stored in the basement or closets in an orderly condition.

39. Shavings, cuttings and waste materials in school shops shall be placed in metal receptacles with hinged lids. All such materials shall be consumed in the furnace each day before the janitor leaves the building.

40. Nothing shall be stored in the attic, fresh-air intakes, or ducts of the ventilating system; on fire-escape stairs, in corridors communicating to fire-escapes, or under open stairs.

41. No matches other than safety matches shall be brought into the building.

42. Janitors' rooms, work benches and toilets shall be kept clean, free from dust, and accumulation of waste materials or rubbish.

43. Cloths shall not be hung on radiators, steam pipes, electric lamps nor electric apparatus.

III. Cleaning.—44. The floors of the entire building shall be swept every day, after the close of school; every piece of furniture, window sill, balustrade, and ledge shall be carefully dusted every morning at least one hour before the

children are admitted. All *wooden* floors shall be oiled according to instructions in Appendix B of this manual. All floors other than wood, except in those parts of the basement not used by pupils, shall be scrubbed with soap and water once in two weeks. Windows and sash shall be cleaned once in every two months, or oftener, if necessary.

45. Whenever the occurrence of contagious disease necessitates the vacating of a class-room, the janitor shall scrub the room with the official disinfecting fluid. This is to be used on toilet seats, desks, floors, woodwork, door knobs, and all other parts which come in contact with the skin of the body. It is always to be used in cases of epidemic. It shall be used in the general housecleaning during vacation period. At least 1 can of this disinfectant shall be kept in the building at all times. It may be obtained upon written application of the principal to the storekeeper.

46. The grounds surrounding and sidewalks belonging to the building shall be kept free from ice and snow, and shall be cleaned and swept as necessary.

47. Out-houses, urinals and water-closets shall be washed daily, except when freezing weather renders this impracticable; walls and ceilings of out-houses that are plastered but not painted shall be whitewashed during the summer vacation. In all other out-houses the walls and ceilings shall be washed down as often as necessary to keep them thoroughly clean. Latrines shall be flushed, and the plug lifted twice a day during the school sessions between April 1 and November 1, and once a day during the remainder of the school term.

48. Chloride of lime shall be used in the final rinse water in and around toilets or other places where objectionable odors arise. It is always to be dissolved in water before using. As chloride of lime deteriorates rapidly in air, it shall be kept in tightly covered cans. A supply sufficient for three months only shall be kept on hand. It may be obtained upon written application of the principal to the storekeeper.

49. All surfaces of furnaces and boilers, and of hot air and steam pipes, and all parts of the cellar shall be kept clear of dust, cobwebs and rubbish. Cellars shall be ventilated during warm weather by keeping the windows open during the day. Wood and coal shall be kept in compact piles. In non-fire-proof buildings ashes shall not be piled within 3 feet of the joists; in fire-proof buildings they may be stored to the capacity of the storage space.

50. After drums have been removed from furnaces, the fire boxes, air chambers and air ducts shall be thoroughly cleaned, and the interior walls of furnaces whitewashed.

51. During the summer vacation the entire building shall be thoroughly cleaned, the walls and ceilings of all rooms and corridors wiped down, and the cellars whitewashed.

52. The housecleaning of rugs and carpets exceeding 200 square feet in area will be cared for upon requisition of the principal. All other cleaning of carpets and rugs shall be done by the janitor.

53. Janitors shall furnish all materials and implements required, except such as are provided by The Board of Public Education.

IV. Repairs.—54. Janitors shall make minor repairs to the building, machinery, or equipment.

55. Mechanics employed by The Board of Public Education shall present to the janitor time cards, which he shall sign after recording the actual time of their arrival and departure. The janitor shall report immediately to the Superintendent of Buildings any such work which has been improperly done.

56. Janitors shall record also the names of all firms sending mechanics to the buildings to make repairs or to do new work, the exact time expended, and the amount of material used. These records shall be available to The Board of Public Education Building Inspectors.

57. Upon completion of the work the janitor shall report immediately to the Superintendent of Buildings any neglect

on the part of the contractor to leave the building and premises clear and free from waste material and rubbish.

58. Janitors shall refrain from all unnecessary conversation with mechanics at work.

V. Procedure for Good Housekeeping Inspectors.—Inspectors shall operate under the directions of the Superintendent of Buildings, who will assign to each inspector each month a definite list of schools to be inspected.

They shall work eight hours per day, from 8 A.M. to 5 P.M., with one hour off for lunch. When requiring special information, they shall start earlier, or later, as may be necessary.

Inspectors shall once each month make a thorough examination of each building and all parts and contents thereof, for fire and accident prevention, sanitation, housekeeping, domestic economy, operation and care of heating, lighting and ventilating apparatus, and assist in the conservation of fuel.

Inspectors shall address principals and janitors in a courteous, straightforward manner, and, by suggestion and advice, assist and instruct janitors in their duties, and request the principal or janitor to at once correct hazardous or insanitary conditions, and see that the condition is remedied before leaving the building.

Each inspector shall make daily written report of each school inspected, showing the condition of the building, apparatus, etc., with his criticisms and suggestions. Reports shall be made in triplicate; original for the Superintendent of Buildings, duplicate to be left with the principal and triplicate to be retained by the inspector.

While principals will each month hold two fire-drills, each inspector shall once each month call upon a principal without pre-arrangement for a fire-drill to be conducted in his presence, and shall make written report, noting time drill was called, time taken to vacate building, exits used, action of pupils, and any suggestions for improved methods.

Initial Inspection.

Upon every change of inspectors from one district to another, the first re-inspection of each building is to be regarded as an initial inspection. Each inspector, on his initial inspection of a building, shall report on the following items, and on every succeeding inspection note any changes from the original conditions:

A. Fire and Accident Protection.

1. Character of construction.....

2. Exposures to fire from surrounding properties.....

3. Condition of fire-escapes.....

4. Outside protection—No. of fire hydrants within 400 feet.....

Fire-alarm box No.....
Distance.....
Location of key:
At the box.....
At the school.....
Nearest fire-engine house.....Blocks

B. Sanitation.

1. Normal pupil capacity of building—Girls.....
Boys.....

2. Pupils' toilets—Location.....
Type.....
Number of seats—Girls.....
Boys.....
Number of urinals.....
Lineal feet of urinals.....

	Yes	No
3. Are floors properly graded to drain?	.....	.....
4. Is there a floor drain and water connection for flushing?	.....	.....
5. Light—Natural, adequate?	.....	.....
Artificial, adequate?	.....	.....
6. Heated?	.....	.....

	Yes	No
7. Lavatories—Number		
Location		
Water supply—Hot		
Cold		
8. Number of teachers—Men		
Women		
9. Teachers' toilets—Number of seats—Men		
Women		
10. Water supply of building—Adequate?		
Economically used?		

C. Operation of Plant.

1. Are ceilings protected over boilers, heaters, heat pipes, smoke pipes and gas flames and woodwork back of, and floors under, gas ranges?		
2. Is woodwork protected where steam or heat pipes pass through floors, ceilings, partitions, etc.?		
3. Are electric wiring, lights and other apparatus properly protected?		

Subsequent Inspections.

To include reports on the following items:

D. Fire and Accident Protection.

	Yes	No
1. Fire extinguishers—Number of 2½ gallon		
1¼ gallon		
1 quart		
An extinguisher for every 100 feet of corridor space in fireproof buildings?		
An extinguisher for every 2½ classrooms in non-fireproof buildings?		
An extinguisher about electrical apparatus, engine rooms, motion-picture booths and kitchens?		
Good condition?		
Charged within a year?		

	Yes	No
2. Sand buckets—About ranges?		
Marked "Fire"?		
3. Fire-blankets—In each domestic science kitchen?		
Marked "For fire only"?		
4. Fire-hose—Are all parts of cellar or basement reached by fire hose?		
Good condition?		
5. Fire-alarm gongs—Good condition?		
Used only for fire drills?		
6. Waste paper—Baled daily?		
Safely stored?		
Number of bales on hand?		
7. Are heat and vent registers, boxes, ducts and flues free of combustible material?		
8. Are coat closets, wardrobes or lockers free from fire hazards?		
9. Are curbs, pavements, yards, inlet covers of manholes, water, gas and sewer connections in pavements, and flagpoles in a safe condition?		
10. Are entrances, steps, stairways, hand railes for same, passages, roofs, cornices and other projections, walls, grilles over areas, guards around entrance areaways and moving parts of machinery in safe condition?		

E. Sanitation.

1. Stack stoves—Good condition?		
Fire maintined constantly?		
2. Wash-rooms—Clean?		
3. Toilet-rooms—Clean?		
4. Toilet paper—Sufficient dispensers?		
Adequate supply?		
5. Latrines flushed according to directions?		

F. Cleaning.

	Yes	No
1. Sweeping according to directions?		
2. Dusting according to directions?		
3. Walls cleaned according to directions?		
4. Windows cleaned according to directions?		

	Yes	No
5. Are fences, doors, wainscots, walls and any other surfaces free of dirt, pencil and chalk marks?		
6. Yards clean?		
7. Sidewalks clean?		
8. Window areas clean?		
9. Air ducts and plenum chambers clean?		
10. Wooden floors oiled?		

G. Operation of Plant.

1. Coal handled economically?		
2. Fires properly cleaned?		
Operated?		
3. Are general conditions in and about boilers, engines, generators, motors, fans and pumps good?		
4. Are boiler tubes, combustion chambers and other inside spaces of boilers, smoke breechings, pipes and base of smoke flues and boiler water clean?		
5. Engines and motors operated at full speed?		
6. Knocks or noises about pumps, generators or motors?		
7. Steam or water leaks about boilers, engines or pumps?		
8. Undue sparking about generators or motors?		
9. Floors and machines free of grease and oil?		
10. Windows of fresh-air rooms or ducts kept open when plant is in operation?		
11. Cheesecloth filters clean?		
Good condition?		
12. Is surplus direct radiation cut out in mild weather or after the building has been heated to the proper temperature?		
13. What part of building overheated according to temperature charts?		
Cause		
14. What part of building not sufficiently heated according to temperature charts?		
Cause		
15. Temperature regulating system operating?		

H. General Housekeeping.

	Yes	No
1. Are covered metal containers used for rags, shavings and other waste materials of a combustible nature?		
2. Metal cabinets used for storing paints, oils, etc.?		
3. Are there any unauthorized installations or connections with gas or electric lines?		
4. Are ashes stored according to directions?		
5. Storage closets clean?		
Orderly?		

Appendix A.—*Operation of Heating Plant.*—In connection with the mechanical heating plants, direct radiation is provided for auxiliary heating and is so arranged that different sections can be turned on or off by hand valves.

When the outside temperature is between 30° and 45°, the first, or least, amount of direct radiation shall be turned on.

When the outside temperature is between 15° and 30°, the second or intermediate amount of radiation shall be turned on; the first amount shall be turned off at this time.

The total amount of direct radiation shall be turned on only when the outside temperature is below 15°.

The use of direct radiation for the purpose of heating any classroom without the operation of the ventilating fan is strictly prohibited.

Janitors shall shut off the risers supplying the direct radiation during the early fall and late spring months.

All engine- or motor-driven blower plants and their connections (air washers and humidifying apparatus) shall be operated at a maximum speed whenever heat is required in the building.

The blower plants for heating auditoriums or assembly rooms shall be operated at all times when the room is occupied either day or night.

Recirculation of air shall not be permitted during the school session.

Dampers which have been placed in ventilators shall be open at all times during the school session.

Appendix B.—*Oiling Wooden Floors.*—The purpose of oiling floors is to prevent floor dust from rising during the process of sweeping. Unless floors are properly oiled they will "gum up" and retain a considerable amount of dirt, especially along the edges of the room, close to the walls and under the seats, giving a black and objectionable appearance and leaving floors in an unsanitary condition. To prevent this the following instructions should be carefully observed.

In buildings where the floors have not been previously treated with oil, or where the treatment has left a black floor, or where in the cases of epidemic the rooms or buildings have been ordered thoroughly cleaned and disinfected, the floors shall be scrubbed with an alkali or naphtha soap and the excess soap rinsed off with clean water and the floors left to dry out thoroughly.

Oil used shall be a non-viscous neutral Pennsylvania crude oil, not darker than a light amber, and having a specific gravity of not less than 30 degrees Baumé, measured 60° F. It shall be free from acid, tarry or any other deleterious matter, or mixture of any sort, which becomes gummy, sticky, or rancid after being applied hot.

Oil shall be applied at a temperature of 110° to 125°, or just hot enough to allow the placing of the fingers in same.

Extreme precaution shall be taken to prevent overheating the oil to avoid possible damage to the building by fire.

It is recommended that the oil be applied with a mop or a brush similar to a blackboard eraser and well worked into the pores of the wood. If a mop is used the end of the mop only should be dipped into the oil and the mop frequently squeezed out; the excess oil from the squeezing being allowed to settle in a separate container to remove the dirt. Patent oilers similar to a brush with reservoir over same are prohibited.

SPECIAL CLASSES FOR PHYSICALLY DEFECTIVE CHILDREN.

The need for removal from regular and placing in small classes especially adapted for such defects those pupils so handicapped is an undisputed problem. The progress of the pupil afflicted as well as the others in the class is affected by their presence.

The following are defects for which special facilities have been offered. 1. Tuberculosis (not including those active cases excluded by law).

2. Nutrition, for the undernourished malnutrition pupils.

3. Orthopedic, for those crippled to an extent which prevents walking to and from school, and endangers the child while among normal children.

4. Ocular for those whose vision is so impaired or a progressive myopia which would endanger the remaining vision by regular class-room work.

5. Deaf, for pupils with impairment of hearing to a degree which prevents being taught under ordinary conditions.

6. Speech defects, such as stammerers, lisping, etc., which may be improved or cured by training.

7. Mentally defective, to an extent which prevents obtaining education through normal channels, but not severe enough for an institution.

8. Disciplinary, for unruly cases whose lack of discipline is not caused by physical defects.

General Considerations.—All children should be offered the advantages of an education, and many States go further and through child labor and compulsory education laws compel all children between the ages of seven and fourteen or even sixteen to attend some school. In every city there is a number of children who would be denied the benefits of our schools if special extraordinary arrangements were not offered in what are termed special classes. Some of the above eight groups while termed special classes and so exist in some

cities, are better suited in regular classes and at stated intervals during session to receive special instruction by special teachers. It is important for an inspector to be mindful of certain facts in disposing of these unusual cases. Sometimes placing in a special class may place an undesirable stigma on a child, which the child may resent if of a sensitive disposition. Most people with marked visible defects are self-conscious and sensitive, and we owe them all consideration to try not to wound their feelings.

The added expense of special education should receive due consideration. The annual cost per pupil is doubled. The inspector should exercise care and sound judgment in deciding on admissions as aside from the financial burden, an injustice may be done to the child. It is better, where supervisors exist, to place the responsibility on them. Occasions arise where a number of factors must be weighed. A few examples may better illustrate. A boy, aged fifteen years, having one year to attend school before past compulsory laws, feigns partial blindness. The object of trying to be placed in an ocular class was to be relieved of arduous school tasks. Malingerers are rare but must be avoided. A child aged seven years cannot talk and a diagnosis of deafness is incorrectly made. A cripple, of the spastic cerebral type is placed in an orthopedic class. The child is so feeble minded that it is unteachable. These cases are frequent and should be in an institution. It never was the intent of the law to insist on using a public school system, even in special classes, to give an education to children of this type.

In ocular classes, every child with a large amount of myopia is not a proper candidate, unless the condition is proven to be progressive and detrimental to the child's welfare. A child who has reached sixth or seventh grade without any untoward symptoms has nothing to gain by being transferred to a special class.

Moderate deafness and speech defects require no special classes. For speech, a specially trained teacher should take

them for a short period daily, and at other times the children should attend regular class. Their absence from sewing, shop or some other vocational lesson to attend such special instruction is advisable.

Open-window classes for malnutrition should be replaced with hours of special instruction during intervals between regular classes. This is more fully discussed under open-window classes.

Special classes for tuberculosis, commonly termed "open air, or "nutrition tubercular."

"Open-air" and "open-window" (nutrition) classes are monuments to past mistakes in handling the problem of tuberculosis and its ally, malnutrition, in the schools. Active cases of tuberculosis are sick children requiring medical treatment and should have no place in the schools. In some States such cases are excluded by act of legislature. Incipient cases is a loose term which presumably refers to those in the earliest stages, those for whom a diagnosis has not been made and ordinarily labeled suspicious, and more frequently merely children suffering from under nourishment and malnutrition. It is the rule to place in open-air schools or classes incipient cases and quiescent ones, and in open-window classes malnutrition cases. The proven cases in incipient stage are in need of constant medical supervision and observation to an extent which cannot be given in any school. These children belong in a preventorium. It is more economical and far more satisfactory for a board of education to employ teachers to perform such services in a preventorium connected with a hospital. It is a medical more than an educational problem. Medical experts would have the opportunity each morning to observe each child and decide whether it should attend class or be placed at rest. Frequently in an open-air school a child is seated at a desk endeavoring to study and has a rise of temperature and rapid pulse, danger signs for medical attention. Education must be subsidiary to the health of the child. In these institutions the school

hours and the leisure ones can be supervised to the greatest benefit of the child. The open-air school has nothing special to offer but fresh air, inadequate rest periods and some food to add to an education; the sanitarium gives fresh air, sunlight, properly selected food and feeding, rest, recreation and study under constant medical and nursing skill and supervision. In a fresh-air class both school physician and nurse have too many other duties to offer the necessary attention required by this class of pupils. Frequently the little good accomplished in the five hours of schooling is lost in the hours at home.

Open-window classes is a confession that only malnutrition cases shall receive fresh air and this to be given at times at uncomfortable temperature. It is true that fresh air exists at comfort temperature as well as at freezing. These pupils are in need of nourishing food and a supervision of home conditions which should be available in regular class as well as in special. As to fresh air, it is the duty of educators to furnish such a necessity to every child in every class. A poorly nourished child is often one who has little resistance and stands low temperatures poorly. He is in need of fresh air but at comfort temperature. The lack of fresh air in our schools is an indictment against the designers and builders of our school plants.

No warfare against tuberculosis is efficient which neglects the medical supervision of malnutrition in children, the suspicious and loosely termed incipient cases. New York City has established classes in the tuberculosis sanatorium at Otisville. Chicago has them in the Municipal Tuberculosis Sanitorium and reports caring for about 1500 children, many serious malnutrition cases, some who have been exposed at home to infection and some suspicious ones. Chicago and several other large cities have had interesting, valuable and successful experiences with preventoriums.

The preceding personal views on open-air and open-window classes are offered for the purpose of stimulating constructive

thoughts on solving a serious problem. For those who desire data on existing classes and their conduct there is offered the following illustrations and information.

FIG. 42.—Nutrition tubercular classes. Study hour.

FIG. 43.—Nutrition tubercular classes. Study hour.

There are various types of open-air schools to be found in Europe and United States. The types of children which are admitted are as variable as the schools. In Germany the

schools are termed "Waldschulen" or "Forest Schools." These are feasible during summer seasons or in temperate climates. Chicago has an institution like the vacation country homes, known as "Outing Camp at Algonquin."

FIG. 44.—Nutrition tubercular classes. Lunch time.

FIG. 45.—Nutrition tubercular classes. Rest period.

The common types of fresh-air schools used in this country are open-air class-rooms built on the roof of a school or institution, and temporary or portable structures located on the

grounds of a school lot. These have a flooring, roof, sufficient sides to protect against wind and weather, and curtains to entirely enclose in bad weather.

A list of the existing open-air schools has not been published since 1910 when 55 classes accommodating 1755 pupils existed. It is impossible to estimate the correct number at present because the cities reporting do not say whether the classes are exclusively for cases of tuberculosis. Malnutrition, pretubercular and heart cases are frequently admitted.

These classes have a special curriculum including rest and lunch periods. While in attendance the children are protected against the cold by wearing wraps, caps and mits. When needed, blankets are added to the covering, and boots worn.

The following is the report from New York stating the kind of cases eligible to open-air classes:

Open-air Classes.—NEW YORK.—The selection of pupils for open-air classes is a subject that has been much under discussion. After conference between the administrative offices of the physical training department of the department of education and the department of health, there has been finally set down the order in which children should be admitted to these classes. Previous to this time children had been admitted in the following order:

1. Those exposed to tuberculosis at home or in whose family there had been a recent death from this disease.
2. Children who had had tuberculosis but which had been arrested or cured.
3. Children suffering from malnutrition.
4. Children who became easily tired or showed languor or fatigue before the end of the day and who, on that account, were unable to carry on their class work.
5. Children who were frequently absent because of colds, bronchitis, etc.
6. Children suffering from nervous diseases, except chorea.
7. Children suffering from cardiac diseases who were recommended by their private physicians as being proper cases for these classes.

This method of admission was considered rather broad and the standard of admission adopted by the conference is looked upon as a step forward. Under the new regulations, children are admitted as follows:

1. Those who show tuberculous infection but have no signs of active disease, that is, the so-called tuberculous type; for example, showing a positive von Pirquet or glandular foci, with moderate or marked degree of malnutrition.

2. Children exposed to an active case of tuberculosis, especially a positive sputum case, and particularly those showing a moderate or marked degree of malnutrition.

3. All definitely arrested cases of pulmonary or other form of tuberculosis.

4. Marked cases of malnutrition.

It is the duty of the department of health to ascertain which school children are of the type that needs open-air class care, and to recommend such to the department of education for admission. The bureau of preventable diseases furnishes regularly to the bureau of child hygiene a list of children in families who are attending the departmental tuberculosis clinics, so that such children may have priority in admission.

Orthopedic Classes.—In no class of physically handicapped children is there more necessary need of furnishing special and unusual educational facilities. These children crippled chiefly by the ravages of infantile paralysis (anterior poliomyelitis) and tuberculosis of bones and joints, are unable to reach a school in safety and require special transportation in wagon or autobus. In class they should be seated in specially constructed seats and desks. The studies and exercises are arranged according to the ability of the individual child to perform. Rest periods and luncheons are needed, as the child is taught in a single session. Teachers with an abundance of sympathy and trained to know the difficulties and how to meet them are placed in charge.

The bus is in charge of a careful driver of strong physique

who can aid in carrying the children from home and school into the bus. The seats in the conveyance must be comfortable. A nurse or woman attendant accompanies the bus to see to the comfort and safety of the pupils. Much of the work in class should be vocational. The variety and proportion of defects or diseases which are responsible for the crippling may be judged from Philadelphia which maintains 17 classes with an enrollment of 350 pupils. Fifty per cent are due to infantile paralysis with one or both lower extremities affected

FIG. 46.—Transportation of crippled pupils by autobus, Philadelphia.

and occasionally an arm. Twenty per cent are deformities due to previous tuberculosis of bones or joints, mostly of the hip. Fifteen per cent are paralyses of cerebral origin, congenital and acquired. The remaining cases are divided among many defects, including amputations, rachitis, lordosis and less frequent palsies of childhood.

A word of caution should be offered in deciding on admissions to orthopedic classes. A study of the mentality of such pupils would reveal that 15 to 20 per cent are of low

mentality and about 10 per cent to an extent to label institutional cases. It seems a waste of educational funds to perform work which benefits neither the child nor society. The State should offer permanent care for these cases in a suitable institution. In special classes they take up the major part of a teachers time to watch and protect. They occupy valuable space which is needed for more worthy pupils, generally on a waiting list. The inspector or physician who certifies for admission should always include a mental examination.

"Ocular" or "Sight-saving Classes."—Ocular or sight-saving classes are valuable adjuncts to a school system. In every city there are children whose serious lack of vision prevents them from availing themselves of the benefits of an education. The class of cases which should be admitted are divided into two distinct groups and these separate groups if possible should not be in the same class taught by the same teacher. (1) Children who have opacities of the cornea of both eyes to a degree which cuts down vision to one-third or less of normal. These pupils as a rule are not injured by the use of their eyes, as they do not use them more than it is possible. The examiner must be sure that there is no acute inflammatory process in the cornea and the existing condition is the remains of an old inflammation. The causes may be any severe inflammatory disease, trachoma, keratitis of any of the varieties, syphilis (generally congenital), tuberculosis. Do not admit children who have one normal eye and the other opaque, blind or nearly so.

It should be a duty of an inspector to endeavor to diagnose corneal conditions from syphilis and tuberculosis, as urging treatment occasionally results in a return of useful vision. These pupils can be given some writing and reading if they succeed in seeing enough.

The second group of cases for ocular classes include high myopes with vision of one-third or less and moderate myopes who are known to have a progressive condition. To diagnose

progressive myopia one should have the results of previous examinations, including findings in fundus. Every myope even, though wearing considerable concave lens, is not progressive.

In this class of myopes may be placed children who have degenerative changes in retina, choroid or nerve, and congenital cataracts.

The work in the class-room should exclude or permit a minimum of all near work, like reading or writing. Reading should be only from special books using large type. The class must not have in attendance more than 12 pupils.

No home work should be assigned but the child cautioned to spend spare time in open air with healthful exercises.

Equipment.—The selection of a suitable room in the school, one well lighted naturally and ventilated. Constant sunlight is an objection because of glare. Northeast or northwest exposure is preferable. Windows may be on two sides with relation to desks from behind and to left. Building obstructions are objectional, window area should be a minimum of 25 per cent of floor area, artificial lighting should be an approved fixture with electricity and ample power to procure good daylight effect on a dark day. Semi-indirect system as described in the Section on Lighting should be chosen.

The color of paint on ceilings and walls should be gray or buff. Two or three shades of the same color with the darker for a distance of 3 or 4 feet from floor, and for ceiling the lightest shade should be selected. Flat tints with no gloss prevents glare. Woodwork should be a trifle darker. Window shades should be opaque and buff color and on movable fixtures.

Blackboards when used should have permanently painted in one corner a sample of the size of letter which the teacher should use as a minimum. This should be 4 inches square with a heavy stroke of one-half inch.

The desks and chairs should be of a movable type and

freely adjustable to any angle or size. The board and work must be as near the childen as possible, so the desks should be brought to the work.

The Moulthrop desk with some modifications can be made very suitable. The top of desk can be placed on hinges which will permit turning the underside at an angle of 45 degrees, and within 15 inches of the eyes. On this reverse side is placed a slate. White on black background is easier on vision than the reverse of colors.

The use of writing or reading especially for myopes should be at a minimum; the child obtaining most of his teaching by ear. Paper should be white and unglazed; pencils heavy soft lead. Typewriting is a good method to adopt when the machine has large type and fitted with specially labeled keys. It may be preferable to omit the labels or use a shield to hide them. This outfit should include a copying stand which will be in correct line of vision.

Books published with large clear type are available from Howe Publishing Company, Cleveland. The assortment is comparatively large, including verse, geography and history.

A McGrath Fraction Board, made in Boston, is valuable to teach arithmetic. The author has utilized large wooden letters and numbers painted white to teach spelling and arithmetic. These letters have a small block on the back and fit in grooves of a frame readily made to accommodate four or five lines.

Most of the material and curriculum in vocational teaching can be applied to ocular classes.

Children attending special sight-saving classes should be given the advantage of returning to regular class such part of the session when the work is of a character which will not require use of eyes. This keeps the child interested and contented, as well as aiding to keep the pupil up with the grade.

It is unfortunate that the good part of the pedagogical side has not been coördinated and the work performed in

these classes systematized. A good course should be outlined.

Reëxaminations of eyes at intervals of six months after admission to sight-saving classes are essential. The progress of the eye condition can be carefully watched and noted. The diagnosis and instructions on what to avoid should be furnished on suitable forms to the teacher.

Admission to class should be only on the signed form of an oculist, preferably directly associated with the department of school inspection. He should decide each case on its own merits and not on any fixed standards of vision.

No opportunity should be lost to return to regular class those pupils whose eyes improve under care and treatment.

The teacher plays no small part in the success of these, as in all special classes. Her sympathy and knowledge of afflicted handicapped children, her initiative and originality in devising methods of teaching are most needed. These classes, of necessity, are ungraded and small enough to permit a teacher giving personal instruction.

The first sight-saving class was established in Roxbury, Boston, in 1913. This was followed by two classes in New York in 1915, and since Philadelphia, Jersey City, Newark, Detroit, Cleveland, Cincinnati, and other cities have followed.

New York.

The Department of Education has organized special classes in the public schools for partially-sighted and blind children. Those for the partially-sighted are called "sight-conservation classes." Specially trained teachers are put in charge of them and special equipment is provided to enable the partially-sighted to do the school work of normally-sighted children without further injury to their eyes. In accordance with a plan of coöperation between the Department of Health and the Department of Education, all candidates for these special classes must be passed upon

by the Supervising Oculist of the Bureau of Child Hygiene. With the consent of the parents, unless under proper treatment, all candidates are given a thorough eye examination and suitable cases are recommended to be admitted to sight-conservation or blind classes, as the case may be. Accompanying the recommendation to the special class are special instructions as to the use of the eyes of each individual child. The sight-conservation clinic assumes charge of the treatment and care of the eyes of these children, not otherwise provided for by private physicians or institutions. Due to the efficient coöperation which enables the clinic to control the attendance of the child, and compliance with instructions, and due to years of experience in this special class of eye work, the sight-conservation clinic has wrought a surprising amount of improvement in the eye conditions of these visually crippled children who, but for this clinic, would be uncared for, in the great majority of instances.

The correct refraction of these most difficult cases requires the skill of highly trained oculists in this special class of eye work. Many prescriptions must be made on skiascopic test alone and many have been made with astonishing results following, both in improvement and development of the child's vision, as well as remarkable and rapid progress in its mentality and school activities.

One of the special treatments developed at this clinic is the negative galvanic treatment for corneal scars. In one particular case, vision was improved as much as from 10/200 to 20/30. About 140 children with such scars are under treatment at the present time. Wassermann tests are made and all syphilitic cases are treated at the Department of Health Clinics, unless otherwise cared for.

There are 35 sight-conservation classes and 8 classes for the blind in public schools in the various boroughs. A total of 663 children attend these classes and the Supervising Oculist of this bureau has recommended that about 800 more be admitted. No provision is available for these at the

present time, however, although the Department of Education authorized 15 new classes for 1923.

The great benefit to the children in these special classes is becoming more evident each term. Children handicapped by crippled vision have been enabled to do the regular work of the normal child of the same age and, furthermore, due to the superior mental concentration of the blind and partially blind, many are outstripping their normally-sighted schoolmates in school work. In the blind classes, the Braille and other usual systems are taught. The beneficial effects on the sensitive growing child of association with normal children, as obtains in our public schools, as compared to the depression of mentality and personality produced by institutional life and teaching, is very marked and of vast importance.

A new activity is the instruction of prospective sight-conservation teachers in the eye clinics of this Department. Each teacher who takes the special course for license to teach sight-conservation classes is required to attend thirty hours at the Department of Health Clinic. As there are more teachers taking the course than can be accommodated at the sight-conservation clinic, a number have had to be assigned to other departmental eye clinics.

The Supervising Oculist is most desirous of making studies of large groups of children presenting special problems, but the vast number of cases of all kinds applying for treatment at the various eye clinics has made it almost impossible to care for the routine work, so that it has not been possible to undertake these special studies.

It is quite evident that, if the large amount of ocular work needed for our school children is to be properly cared for, either additional oculists will have to be appointed and additional clinics established, or else the various eye hospitals and dispensaries especially equipped with eye service must be asked to give these little ones more time and attention than they now receive. A comparison of the amount of

work done in the clinics in 1921 and 1922 shows a considerable increase for the latter year:

TABLE X.—STATISTICAL REPORT OF WORK OF EYE CLINICS IN NEW YORK FOR 1921 AND 1922.

	1921.	1922.	Increase.	Decrease.
Total number of visits . . .	84,591	86,139	1548	
Number of new cases . . .	21,831	24,672	2841	
Number of refractions . . .	35,538	42,449	6911	
Number of treatments for contagious and other conditions .	49,125	55,381	6256	
Prescriptions for glasses . .	10,400	11,233	833	
Medical prescriptions filled .	77,181	71,874	..	5307
Electrical treatments for corneal opacities	1,730	2,602	872	

Classes for Deaf Pupils.—Classes for deaf pupils have been established in several large cities in connection with public education. Total deafness from birth is more frequently associated with inability to talk and is an institutional child. When the child can talk, training in lip-reading and through the visual sense is successful. When deafness is acquired early in life but after some efforts at education, training is more effective with visual sense. The cases which are found in class during examinations are labeled backward and found to have not a total deafness but an impairment to a degree to prevent ordinary class instruction. Hearing should be tested on every child using whispered voice at 20 feet. Caution must be taken to eliminate from such classes those who are feeble-minded. Malingerers for deafness are rare. The author recently diagnosed such a case in which cotton was plugged in both ears and was an applicant for a deaf class. Philadelphia has 6 classes with 60 pupils.

Special Classes for Backward Children.—Special classes for backward children should not be confounded with feeble-minded which require institutions. The child who is extraordinarily sluggish or falls behind in his class may possibly be brought near average by special instructors known as

restoration teachers. These instructors make a personal study of the individual pupil and train them along the lines most needed.

The child which is not subject to restoration, and mentally three years under age requires a continued attendance in a class where the curriculum is suited to his needs and power of assimilation.

A more detailed account of the child who is backward is included in the Section on Mentality.

Defects of Speech — Defects of speech require special instruction while attending regular class rather than constant attendance in a special class. A teacher trained for such work should have these pupils for a part of the daily session. She must have patience and a personality which wins the confidence of those afflicted. These pupils are very self-conscious of their defects, fear ridicule from classmates and teacher, and prefer to keep quiet, remain distant and unobserved. All classes of speech defects which are amenable to training should be placed under these teachers. She should be furnished, by the physician, with a diagnosis and treatment suggested.

The varieties of speech defects, causes and relation to education are discussed under physical defects.

Philadelphia has 10 teachers who conduct classes in separated sections of the city.

Special Disciplinary Classes. — Special disciplinary classes are practically non-medical and require the judgment of teachers and principals. The inspector, however, should not miss an opportunity of recognizing in the unruly child the existence of gross physical defects which may be the cause of his wrong-doing; eye defects in particular and rarely deafness are causative. Under no circumstances should discipline cases be placed with backward pupils. The "Parental School" is the true solution of most of these cases.

PART III.

COMMUNICABLE DISEASES.

GENERAL CONSIDERATIONS.

MEDICAL inspection was first introduced into the schools for the purpose of preventing the spread of infectious diseases, and even today in a number of cities the only duties of the physicians are to protect the pupils from contagion. Many cities are indebted for their school inspection to an epidemic of some infectious disease which played havoc in the schools.

The communicable diseases found among school children are the major infectious diseases or exanthemas and the minor contagious skin and eye diseases. The infectious diseases, like scarlet fever, diphtheria, measles and smallpox, are of first importance to the medical inspector, because they are extremely dangerous and often fatal. The contagious skin diseases may cause an epidemic and inconvenience those afflicted, but are not detrimental to life. The duty of the school physician is to diagnosticate all cases and exclude those which are dangerous in the class-room.

Either by statute, or by rules and regulations of health or educational departments, the school doctors are forbidden to treat any defect or disease among the pupils of the schools under their charge. In this study of diseases and defects, treatment is therefore omitted, except prophylactic treat-

ment, insofar as it concerns the work of the medical inspector. The medical work of the school physician deals primarily with diagnosis; therefore, more consideration is given to this subject. The success of the inspectors in preventing the spread of contagion is largely dependent upon accuracy in diagnosis; therefore, health departments should place at the disposal of their school physicians every opportunity for a thorough training in the recognition of the common contagious diseases at a hospital for communicable diseases. The physician does not have the advantage he would in private practice in that all cases of a suspicious nature found in a school must be diagnosticated at once, as delay is dangerous. At a home, if the attending physician is in doubt, he may isolate the child for a day or so and watch developments before giving a final diagnosis. In school, the physician is not allowed this privilege. Therefore, it behooves the physician who contemplates school-work to become expert in physical diagnosis. Even then a well-trained physician will meet with occasions when the signs and symptoms are so atypical or masked that a diagnosis is impossible and the services of an expert are required.

It is well for a city to have in connection with the corps of medical inspectors one or more diagnosticians, physicians expert in the diagnosis of contagious diseases, to whom all cases of doubtful diagnosis can be referred. Philadelphia has a diagnostician, and four assistants, each in charge of a special disease, typhoid, diphtheria, scarlet fever and tuberculosis.

Certain rules should be observed in the finding of contagious diseases among school children for the purpose of safeguarding the other pupils as well as the community. As this subject is important some space in the succeeding pages is employed to indicate what action the inspector should take when he finds a contagious disease at school.

Prevalence of Contagion among Children.—The so-called children's contagious diseases are not only more common among children than adults, but also more fatal. Scarlet fever, for instance, is eight times more fatal among children and 90 per cent of the deaths from diphtheria occur under the age of ten years, thereby making the schools the greatest camping ground for contagious diseases. Besides the ordinary, typical, and easily recognizable cases there may be mild ones difficult to diagnosticate, including convalescents who have been released too soon; those who have criminally concealed their contagion and returned to school without having exercised any precautions; and the contact cases, or those who have illness at home or in one way or another have been exposed to contagion. There are also normal people, who may carry pathogenic germs in their throats, so termed carriers.

Kirchner, from an investigation in Prussia, has shown that in the first year of life, whooping-cough, measles and diphtheria are the prevalent contagions. In the second year, measles, diphtheria, whooping-cough, and scarlet fever head the list in the mortality rate, and tuberculosis occupies fifth place. From the third to the fifth year tuberculosis occupies fourth place, sixth to the tenth year third place, and from the eleventh year on, first place. These statements were corroborated by investigations in the United States by Dr. Samuel G. Dixon.

All children who are known to belong to families having tuberculosis or who live in a house where the disease exists should be examined by expert diagnosticians immediately upon development of a persistent cough or evidence of general failure of health and strength. When a case of tuberculosis is found the question of early treatment and the advisability of exclusion are important for the consideration of the medical inspector.

Table XI.—Exclusions for Contagious Diseases Reported to the Bureau of Health, Philadelphia, 1921–1922.*

	Seen by inspector.	Seen by second party.	Totals.
Chicken-pox	360	40	400
Chicken-pox (suspicious)	...	13	13
Diphtheria	10	82	92
Diphtheria (suspicious)	14	3	17
Diphtheria carriers (positive cultures)	242	...	242
German measles	16	...	16
German measles (suspicious)			
Impetigo contagiosa	213	1	214
Measles	42	23	65
Measles (suspicious)	...	4	4
Mumps	146	27	173
Mumps (suspicious)	...	9	9
Scabies	380	15	395
Scarlet fever	123	214	337
Scarlet fever (suspicious)	65	6	71
Trachoma	2	...	2
Tuberculosis (lungs)	6	...	6
Tuberculosis (lungs) (suspicious)	1	...	1
Tuberculosis (glands)			
Whooping-cough	14	1	15
Whooping-cough (suspicious)	...	2	2
Miscellaneous	1	...	1
Totals	1635	440	2075

Diphtheria and suspicious diphtheria	209
Scarlet fever and suspicious scarlet fever	430
Total	639

Number of cases of diphtheria in city for 10 school months	2592
Number of these which were public-school pupils	742
Number of cases of scarlet fever in city for 10 school months	4634
Number of these which were public-school pupils	2142

The following is a chart showing the incidence of common infectious diseases among children in the private and parochial schools. Enrollment 90,000.

* Many of these cases were not seen in school but were discovered during home investigations. When a case of scarlet fever or diphtheria is found in school, or if a child has been in school within two days of the date on which the report of a case is received by this office from the Bureau of Health, the class in which it occurred is dismissed for the rest of the day, and the class-room is cleaned with a coal-tar disinfectant and thoroughly aired. During the year 639 class-rooms were so treated, as follows:

Table XII.—Philadelphia.

Disease.	Waiting in office—on account of absence due to sickness.	Sent to office by teachers on account of sickness.	Class-room inspection, following medical reports of contagious diseases.	Home visits, on account of unknown absence.	Total.
Scarlet fever	41	21	40	45	147
Diphtheria	14	11	9	8	42
Chicken-pox	39	26	21	53	139
Measles	25	19	4	5	53
Mumps	48	69	18	59	194
Impetigo	9	34	19	2	64
Scabies	8	23	6	6	43
Whooping-cough	3	3	4	20	30
Total	187	206	121	198	712

Table XIII.—City of Chicago Contagious Disease Contacts and Cases Found and Excluded from Schools.

	1919.	1920.	1921.
Chicken-pox:			
Found	807	347	428
Excluded	807	340	419
Contacts found	865	96	183
Contacts excluded	449	91	167
Smallpox:			
Found	2	2	51
Excluded	2	2	51
Contacts found	240	480	687
Contacts excluded	240	480	673
Measles:			
Found	219	77	126
Excluded	219	77	121
Contacts found	164	39	42
Contacts excluded	164	29	41
German measles:			
Found	8	1	13
Excluded	8	1	8
Contacts found	7	121	0
Contacts excluded	7	72	0
Scarlet fever:			
Found	244	258	215
Excluded	244	258	212
Contacts found	331	186	155
Contacts excluded	236	186	151

	1919.	1920.	1921.
Whooping-cough:			
Found	55	22	49
Excluded	55	22	45
Contacts found	152	4	32
Contacts excluded	151	4	29
Diphtheria:			
Found	90	46	64
Excluded	90	46	64
Contacts found	309	143	146
Contacts excluded	267	143	143
Carriers found	331	336	314
Carriers excluded	331	336	314
Streptococcus sore throat:			
Found	21	0	0
Excluded	17	0	0
Mumps:			
Found	511	432	728
Excluded	495	426	711
Contacts found	260	149	286
Contacts excluded	202	133	243
Tuberculosis:			
Found	4	14	21
Excluded	4	14	14
Acute coryza:			
Found	956	445	776
Excluded	836	386	577
Conjunctivitis:			
Found	639	451	1,490
Excluded	483	298	1,068
Trachoma:			
Found	4	3	8
Excluded	4	3	2
Tonsillitis:			
Found	4,566	3,692	4,945
Excluded	2,426	1,390	2,592
Pediculosis:			
Found	921	396	745
Excluded	490	194	368
Scabies:			
Found	193	127	421
Excluded	179	118	335
Ringworm:			
Found	348	219	387
Excluded	238	119	255
Favus:			
Found	45	18	26
Excluded	45	18	16
Impetigo:			
Found	1,320	922	2,671
Excluded	532	215	795
Miscellaneous:			
Found	17,517	13,096	13,088
Excluded	1,798	2,925	5,212
Total:			
Found	31,129	22,222	28,097
Excluded	11,019	8,324	14,626

Use of Terms.—The following terms in use are more or less confusing to both physician and layman: "infection," "contagion," "communicable," "transmissible."

An "infectious disease" is one due to a special organism, and may be transmitted to others through various channels. All infections are not contagious. Typhoid fever, for instance, is an infection but not a contagion.

A "contagious disease" is one that is transmitted from sick to well by contact. This term is more often used to designate the eruptive fevers, where recognition is based on a period of incubation, mode of onset, clinical course, and a respective eruption which is peculiar to that disease. These include smallpox, varicella, measles, rubella and scarlet fever.

A "communicable" or "transmissible" disease is one which can be conveyed to another. It may or may not be due to a specific microörganism, and it is not necessary to have actual contact with a previous case. Rabies is a transmissible disease but not a contagion; malaria is transmissible through the mosquito, but cannot occur from contact with one suffering with the disease.

A "specific infection" is one due to a special microorganism common to that disease only. These diseases breed their own kind, as in the tubercle bacilli, causing tuberculosis and no other infection.

Methods of Transmission.—The methods of transmission of infection from the sick to the well are:

1. Direct contact with sick.
2. Individuals without symptoms but harboring specific germs—"Carriers."
3. Infected clothing, furniture, or other articles, from contact with a previous case or its secretions.
4. Infection of food and drink.
5. Insects, such as flies and mosquitoes, lice, tics, etc.
6. Infected earth, as in tetanus.
7. Domestic animals.

Bacteria may gain entrance into the body and infect through the following channels:

1. The digestive tract. Microörganisms may gain entrance to the system with food or drink, as may occur with typhoid fever, tuberculosis and dysentery.

2. The respiratory tract. Tuberculosis, pneumonia and influenza are examples.

3. The skin. It is doubtful whether the unbroken skin can admit bacteria. When this apparently takes place there is probably a wound so small as to be practically invisible. The skin is the channel of infection in rabies and tetanus. Tetanus is a form of "intoxication" in which the germs remain at the seat of the wound and there form toxins which enter the system.

4. Glandular system.

5. Heredity. There is no doubt of the transmission of infection to the fetus. This may be from either parent, at the time of conception, as in syphilis, or at a later period from the mother. Smallpox, measles, pneumonia, scarlet fever, tuberculosis, and other diseases are capable of such transmission.

Methods of Detection of Infection.—It is physically impossible for a physician to examine each pupil daily, and even were it possible, a child who presented no suspicious symptoms upon examination might within a few hours have marked signs of a contagious disease. One of the chief means for detecting cases in school is the alert, instructed teacher who sends every child with the least suspicion of an acute illness to the medical inspector for a diagnosis. By "instructed teacher" is meant one who can recognize the common signs of prevalent diseases, such as in a child vomiting, the possibility of its being a symptom of one of the acute infections instead of passing it by as a simple case of indigestion. She will also notice and understand the usual bright, attentive child who suddenly becomes languid and "heavy-eyed," flushed and feverish-looking is a case for inspection by the school doctor.

Knowledge of the existence of communicable diseases by: 1. Personal observation of a child sent by teacher as a suspicious case; a sick child or convalescent one found while making a class inspection; while giving a routine inspection.

2. A written statement from a parent or guardian.

3. A verbal statement from another child in the family.

4. A case seen by nurse or principal and excluded in the absence of the medical inspector.

All the above cases warrant reporting the same to the Bureau of Health.

The medical inspector may aid in keeping his schools clear of epidemics and at the same time interest the teachers to coöperate by occasional lectures on the diseases of childhood. The health department can also help by issuing "A Circular of Instructions for Teachers" which should tell which children to send to medical inspectors and why.

Class-room inspections by allowing the pupils to pass in front of the doctor while standing with his back to a window takes but a few moments and often nets one or more cases of contagion. This is also the best method to adopt when a case has been found and it is desired to trace any possible contact cases. If it was diphtheria, the throat of every child in the school can be inspected and suspicious throats cultured. If scarlet fever was found, the doctor should examine the face and hands of every child for peeling of the skin, sore throat or discharging ear. The author has on several occasions entered a school just when recess was over, and standing at the head of the stairs isolated a case of contagion, while the children filed up to their class-rooms.

All pupils who are absent from school for three or more days without bringing a written excuse, and, if ill, a certificate from the attending physician, should not be allowed to take their seats in the class-room until passed upon by the inspector.

The nurse while assisting the teacher or the doctor in preliminary examinations may occasionally detect a suspicious case which should be referred to the physician.

Some of the subacute or chronic infections, especially of the skin, such as scabies, favus and trachoma, are often detected while making a complete physical examination.

Action Taken by Medical Inspector upon the Detection of a Case of Contagion in Class-room.—A pupil suffering from a contagious disease, even when it is a latent or extremely mild case, should be immediately excluded from the school and instructed to go home and not linger around the school yard or neighborhood. The child is given a special card, stating the disease suspected and ordering the parents to consult a physician.

The central office of school medical supervision is notified by telephone the name and address of pupil, the location of school and disease found. This telephone message is verified by a postal designed for reporting transmissible diseases.

The action to be taken by the school inspector after sending the case home and locating other pupils in the school and belonging to the family, varies with the disease discovered. Details of procedure are given under the various communicable diseases.

The office records should be consulted to see if any other member of the same family or persons living in the same house are attending that school, and, if so, such children should be excluded as "contact cases." Further action at the home of the pupil is a responsibility of the health department and its division of communicable diseases.

Exclusions and Quarantine.—When the school inspector is doubtful of his diagnosis in a suspicious case of contagion, he should exclude the child and by telephone notify the department that he has excluded a suspicious case and desires the diagnosis of the contagious-disease inspector or one of the consultants. Philadelphia maintains four diagnosticians or experts on contagious diseases for such diagnoses.

In all cases where a child is excluded, principal and teacher should be notified and a record made on blanks furnished. The quarantine of the home of the pupil and after-care is

the duty of the health department through its corps of contagious-disease inspectors.

It is the duty of the school medical officer to know the period of exclusion for the various transmissible diseases, as prescribed by statute or by rules and regulation of the health department and the board of education. In some cities these periods vary according to rules of the board of education or State laws.

When the children excluded are permitted to return to school, the principal should receive from the medical inspector a printed postal stating the date of return, and he should send a second postal to notify the child's family.

.....*192*.....

To the Principal of

.....*School.*

Exclude from school *all persons residing with the family of*

.....

No......*Street, who is suffering with* .....*, until a Medical Inspector certifies that the period of exclusion has ended.*

The following persons attend your school.....

.....

By order of the Board of Health.

.....

Chief Medical Inspector.

Per.....

Medical Inspector.

.....*192*.....

To the Principal of

.....School.

The period of exclusion from school of all persons residing with the family of

..... No.....Street,

who has been suffering from.....having expired, said persons are permitted to return to school on.....

By order of the Board of Health.

.....

Medical Inspector.

.....192.....

Sir:

You are hereby notified that notice has been sent to.....School, permitting the return of your child on.....

.....

Medical Inspector.

Periods of Quarantine and Exclusion.—The periods of quarantine and exclusion are specified in nearly all of the States by acts of legislature. Unfortunately there is no uniformity and the variation is considerable. It is the duty of medical health officers to intimately know the laws and periods prescribed. They should not only watch for all changes in these health laws, but try to anticipate all contemplated changes. A health officer at such times may be able to influence the passage of sane, sensible laws conforming and consistent with scientific progress, and the teachings and opinions of experts on public health. Considerable aid and information can be obtained by membership in the American Public Health Association and constant reference to their publications.

Fortunately the trend of all public health laws and regulations is to lessen the time of quarantine to a minimum period which will assure public safety and lessen the burden on the afflicted and their families. With discoveries of causes, pathology, course and immunology on some diseases, there is a marked improvement over old procedures.

In Chicago, by changes in State laws, 1920, the following changes were made:

Scarlet fever shall be terminated in four weeks from date of onset provided all abnormal discharges have ceased. Quarantine officers must examine carefully for discharging glands and ears before performing terminal disinfection. If patient is well otherwise any peeling present at end of four weeks may be disregarded and the case terminated. The patient remains from school one week after the termination.

German measles is quarantined for eight days, and measles five days after appearance of rash and thereafter until cough, catarrhal symptoms and abnormal discharges have ceased, and temperature has remained normal for forty-eight hours.

Whooping-cough remains quarantined for eight weeks or until one week after all paroxysms of coughing disappear.

It is impossible to give the quarantine periods existing in all States, but New York and Pennsylvania is herewith tabulated.

The following table applies for Philadelphia and Pennsylvania and has been arranged by the author in a manner to be readily memorized. Small details are omitted and groupings made to simplify use.

TABLE XIV.—QUARANTINE AND SCHOOL-EXCLUSION PERIODS.

Disease.	Minimum period of quarantine (of patient and of others residing on premises). Days.	Period of exclusion from school.			
		Of sick person (recovery).	Of others residing in same premises and not removing therefrom.	Of others residing in same premises and removing therefrom.	
				Such persons being presumably immune to the disease.	Such persons being presumably not immune to the disease.
Scarlet fever	30	+10	Recovery of patient	Upon removal	14 days after removal.
Smallpox	30	+10	Recovery of patient	Upon removal	14 days after removal.
Diphtheria:					
Antitoxin	14	+ 5	Recovery of patient	Upon removal	14 days after removal.
No antitoxin	21	+ 5	Recovery of patient	Upon removal	14 days after removal.
Ant. poliomyelitis	21				
Whooping-cough	21	+ 7	0	0	0
Measles	16	Recovery	Recovery of patient	Upon removal	14 days after removal.
German measles	16	Recovery	Recovery of patient	Upon removal	14 days after removal.
Mumps	16	Recovery	Recovery of patient	Upon removal	14 days after removal.
Chicken-pox	16	Recovery	Recovery of patient	Upon removal	14 days after removal.
Cerebrospinal meningitis	16	Recovery	Recovery of patient	Upon removal	14 days after removal.
Impetigo	Recovery		0	0	0
Scabies	Recovery		0	0	0
Ringworm	Recovery		0	0	0
Trachoma	Recovery		0	0	0

TABLE XV.—NEW YORK STATE DEPARTMENT OF HEALTH.—COMMUNICABLE DISEASES AMONG CHILDREN.

Rules for Isolation and Exclusion From School.

Disease.	Exclusion from school					
	1	2—Other children of same household.				3
	Patient.	If patient remains isolated at home.		If patient goes to hospital or children leave home when disease is discovered.		Other children especially exposed ("contacts").
		Non-immunes.	Immunes.*	Non-immunes.	Immunes.	
Chicken-pox	Until all scabs are shed and disinfection of person; at least 12 days from onset	Yes; until termination of quarantine; at least 20 days from date of complete isolation of patient	No	Yes; 20 days from date of removal	No	If non-immune from 10th day after *first* exposure to 22d day after *last* exposure.
Diphtheria	Until recovery and 2 successive cultures from throat and nose at least 24 hours apart contain no diphtheria bacilli; cultures not to be taken until 9 days from date of onset	Yes; until termination of quarantine or removal from quarantined premises and until 2 successive cultures from throat and nose at least 24 hours apart show no diphtheria bacilli	Yes; until termination of quarantine or removal from quarantined premises and until a culture from throat and nose contains no diphtheria bacilli	Yes; until 2 successive cultures from throat and nose, taken after removal and at least 24 hours apart show no diphtheria bacilli	Yes; until a culture from the nose, taken after removal, is negative	Until 2 successive cultures from the throat and nose, at least 24 hours apart, are negative.
Epidemic cerebrospinal meningitis	Until 2 weeks after temperature has become normal, *or* until 3 successive cultures from nasopharynx at intervals of not less than 5 days are negative	Yes; 1 week from the termination of quarantine	Yes; 1 week from the termination of quarantine or upon removal from quarantined premises	Yes; 1 week from date of removal	Yes; 1 week from date of removal	Yes; for 2 weeks from date of exposure *or* until a negative culture has been secured.
Measles	Until recovery and disinfection of person; *at least 7 days from onset*	Yes; until termination of quarantine and at least 14 days from date of complete isolation of patient	No	Yes; 14 days from date of removal	No	If non-immune exclude from school from 7th day after *first* exposure to 14th day after *last* exposure.

Measles (German)	Until recovery and disinfection of person; at least 7 days from onset	Yes; until termination of quarantine and at least 21 days from date of complete isolation of patient	No	Yes; 21 days from date of removal	No	If non-immune from 7th day after *first* exposure to 22d day after *last* exposure.
Mumps	2 weeks after onset and 1 week after disappearance of swelling and after disinfection of person	Yes; until termination of quarantine and at least 21 days from date of complete isolation of patient	No	Yes; from 15th to 22d day after removal	No	If non-immune from 15th day after *first* exposure to 22d day after *last* exposure.
Poliomyelitis (infantile paralysis)	Until patient is recovered and disinfection of person; at least 21 days from date of onset	Yes; until 14 days after the quarantine has been raised	Yes; 1 week from the termination of quarantine or removal from quarantined premises	Yes; 14 days from date of removal	Yes; 1 wk. from date of removal	If non-immune 14 days from date of last exposure.
Scarlet fever	At least 30 days from onset and until discharges have ceased and disinfection of person	Yes; until 7 days after the quarantine has been raised	Yes; until termination of quarantine or removal from the quarantined premises	Yes; 7 days from date of removal	Yes;7 days from date of removal	If non-immune until 7th day from date of last exposure.
Smallpox	Recovery and disinfection of person; at least 14 days from onset	Yes; until 20 days after the quarantine has been raised *or* 7 days after successful vaccination and after disinfection of person, if removed from the quarantined premises	Yes; until termination of quarantine or removal from the quarantined premises	Yes; until 21st day day after removal or 7 days after successful vaccination and after the disinfection of person	No	Exclude 20 days, unless successfully vaccinated within 5 years, in which case may return at once.
Septic sore throat	Until 5 days after the disappearance of symptoms	Yes; until termination of quarantine or removal from quarantined premises	No	No	No	No
Whooping-cough	Eight weeks from onset or until 1 week after the last characteristic cough	Yes; until termination of quarantine and 14 days from date of complete isolation of the patient; extend if the cough develops	No	Yes; until 14 days after the removal; extend period if cough develops	No	If non-immune 14 days from date of last exposure; extend period if the cough develops.

Inspectors must use common sense when confronted with unusual conditions, as all kinds of cases cannot be listed and specified for instruction in any table. He must be sure to visit the home before terminating a case to make sure there exists no secondary cases.

Those who are consulted about drafting new health laws should be mindful of the already excess of such laws, and rather should so amend existing laws as to make them more effective by being mandatory, powerful and specifying some imposing fine or imprisonment for disobedience.

Placards.—In Philadelphia, the following contagious diseases are placarded—diphtheria, scarlet fever, smallpox, measles, typhoid fever, cerebrospinal meningitis, anthrax, anterior poliomyelitis and glanders. Yellow placards with black letters are used in all cases except measles, typhoid fever, anterior poliomyelitis and cerebrospinal meningitis, when white placards with black letters are used.

Placards must be placed upon the front and rear entrances to the building and remain there until the case is terminated by death or recovery, and the house has been terminated by the Bureau of Health.

When a contagious disease occurs in an apartment house, or where more than one family occupies a dwelling, a placard is placed on the apartment where the case is quarantined.

As a rule, families with contagion in the household can be trusted to observe the rules of the health department to prevent spread of the contagion. In these cases, placards and general supervision is all that is necessary, but where rules are disobeyed and carelessness exists, the case should be removed to a hospital for contagious diseases or the home quarantined with police officers on guard.

Scarlet Fever.

All persons not occupants of this house are notified of the presence of scarlet fever in it, and are warned not to

enter it until this notice is removed. The person sick with scarlet fever must not leave the house as long as this notice remains here.

NOTICE TO THE MILKMAN.

Milk dealers must not remove bottles from premises where any contagious disease exists without permission from the Bureau of Health.

By order of
The Bureau of Health.

The Act of Assembly, approved May 14, 1909, provides that the removal, defacement, covering up, or destruction of this placard shall be punished by a **fine** of not more than $100 or by **imprisonment** of not more than thirty days, or by both.

The author would suggest the use of a single placard for all communicable diseases and omitting the specifying of the kind of contagion.

Disinfection.—Since it has been conclusively proven that air infection does not exist, the old method of disinfecting with pungent chemicals or vapors have been abandoned in many cities. The infection remains adherent to articles with which excretions or secretions come in contact; coughing sneezing, spitting and other acts place the germs where air disinfection proves of little value. Cleanliness with soap and water, sunshine and fresh air are cheap effective disinfectants. There may be certain chemicals which when added to the water, will increase its efficiency when applied to the infected spots, but they are not essential.

When assigned to *terminal* disinfection, the quarantine officer will visit the home of the patient and require the family to

1. Disinfect by boiling for ten minutes, or immersing in a disinfecting solution for thirty minutes, all articles which have been in contact with the patient, this to include sheets,

pillow cases, towels and other washable articles used in the patient's room.

2. Wash with hot water and soap the floors and woodwork of patient's room and bathroom and the furniture in these rooms. This cleaning in patient's room must include furniture, closets, shelves and other surfaces.

3. Boil all milk bottles for half an hour. The quarantine officer will see that this is started before he leaves.

4. Expose pillows and mattresses in patient's room to bright sunlight for one-half a day, turning them occasionally. The following day the quarantine officer will return and if 1, 2 and 3 are completed, he shall remove placards and mail the usual notices. After removing placards, he will recommend that the entire flat be cleaned and aired, when necessary repapering of rooms should be requested.

5. The patient should receive a bath using soap and water thoroughly on body and head; clean teeth and mouth; change all underwear and washable wearing apparel, boiling them; air all other clothing.

Absentees and Contagion.—Every child who is absent from school for a number of days should be carefully examined for signs of peeling or discharges from the ears or nose. These signs are more significant if the child vomited on the day before absence.

To avoid contagion from diphtheria, cultures should be made from the throats of these absent pupils upon return, and any bacteriological evidence of diphtheria should be ample cause to exclude the child. The dangers from diphtheria carriers should be always kept in mind, and every precaution taken to prevent contagion.

Smallpox.—This disease is very rare among school children in cities where medical inspection is established, thanks to the wise laws that make vaccination compulsory for school children. It is unnecessary to devote any space to a defence of vaccination in order to convince a legally qualified physician, but there are cases when stubborn parents can be

induced to submit their children to vaccination without invoking the laws, by a tactful explanation on the part of the medical inspector. For this reason, it would be well for every inspector to acquaint himself with the contents of a circular entitled "A Message from the Medical Society of the State of Pennsylvania," a plain talk on vaccination.

The effect of compulsory vaccination on wiping out smallpox can be realized by comparing Philadelphia with compulsory laws, and Chicago with optional vaccination. In the three years 1919 to 1921, in Philadelphia there were 30 cases, all of which were imported from the outside; in Chicago there were 499 cases of smallpox, 143 of whom were under the age of fifteen years.

Warning early in 1920 that smallpox was likely to become epidemic throughout the United States and Canada before the end of the year, because of the increasing laxity in the practise of vaccination, has been borne out by the facts. The number of smallpox cases in a group of fifteen States nearly doubled in 1920. Table XVI gives the smallpox data available at the present time:

TABLE XVI.

	1920.	1919.	1918.	1917.	1916.
California	4503	1992	1,069	329	234
Colorado	2878	1714	1,680	323	103
Illinois	6617	3971	3,842	4996	.. †
Indiana	6775	3620	5,582	4593	1158
Kansas	3900	2130	7,130	2623	2085
Louisiana	1558	1120	950	835	819
Maryland	176	212	219	98	69
Massachusetts	29	32	27	65	32
Michigan	4848	2885	4,417	2929	1365
Minnesota	5447	2280	2,252	2718	1270
Mississippi	4148	2511	3,601	1530	1401
Nebraska	4135	2861	3,906	.. †	.. †
New Jersey	181	66	65	6	9
North Carolina	2961	1880	899	.. †	.. †
Ohio	7228	3924	10,227	5243	1921
Oregon	2828*	2381	493	122	119
Pennsylvania	215	198	612	380	97
Texas	1547	.. †	4,338	1350	.. †
Washington	5997	4372	1,676	390	637
West Virginia	2619	2214	1,266	413	.. †

* Up to November 30 only. † No data available.

These figures are quoted to show the increasing prevalence of the disease since the antivaccinationists began to intensify their campaign. If they continue to be equally active in the future in other areas, the record of the States we have just quoted may be equaled in the others.

Very few persons are aware of the startling increase in smallpox incidence in recent years.

Symptoms.—The physical signs and symptoms of smallpox can be studied from any text-book on diagnosis or works devoted to infectious diseases.

After an exposure to the contagion, and a period of incubation of ten days to two weeks, severe general symptoms manifest themselves, especially high temperature, backache, headache, delirium and vomiting. A prodromal eruption appears, which is composed of erythematous or hemorrhagic spots occurring chiefly on the abdomen and inner sides of the thighs; this diminishes in a few days at the same time that the fever and general symptoms subside. The characteristic rash now appears, first on the scalp and face, then on the trunk, arms, and legs in the form of small, red nodules which increase in number and size and develop into vesicles with clear contents. The temperature again rises and the contents of the vesicles become cloudy and a small depression or umbilication forms in the center of the pustules. These remain discrete or run together if much of a rash exists. The rash is especially abundant and confluent on the face and hands. The mucous membranes of the eyes, mouth and throat may be involved. In favorable cases the pustules begin to dry and form crusts in twelve to fourteen days, and separate in three or four weeks, leaving typical scars. The period of infection may last somewhat longer.

Diagnosis.—The eruption in a fully developed case is typical of this disease only. It is to be suspected only in an unvaccinated person or one not vaccinated for a number of years. The diseases mistaken for smallpox are chickenpox, measles and syphilis.

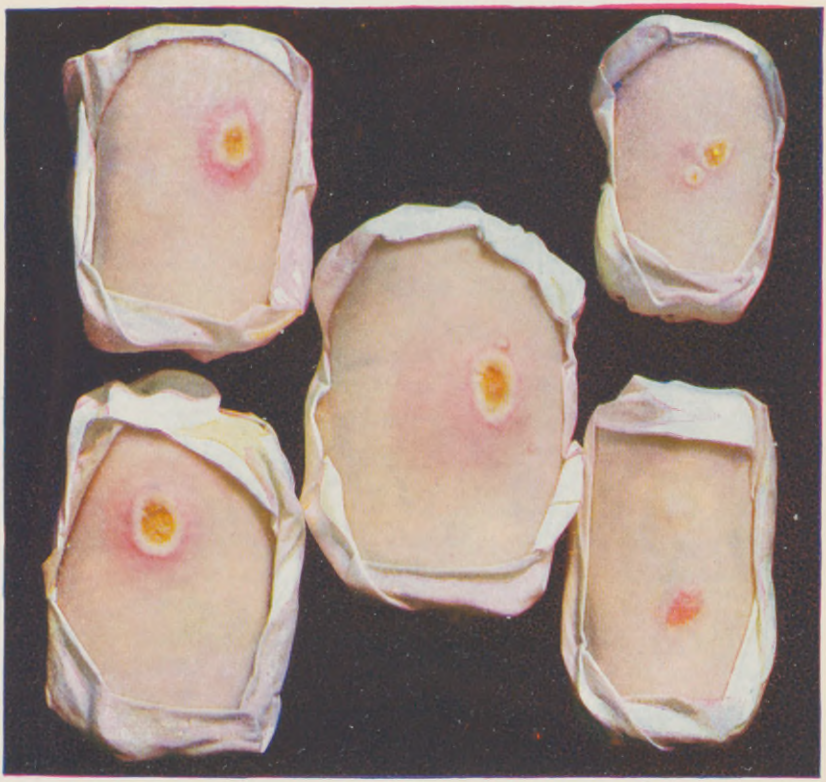
PLATE II

Evolution of Primary Vaccination.

4th day.	6th day.	8th day.
Crust 20th day.	Scar 28th day.	Spurious result.

From Polyclinic Collection of Drs. Schamberg and Wallis. Wax Models made from Life by Dr. J. F. Wallis.

PLATE III



Revaccination.
7th day.

Primary Vaccination.
8th day.

Revaccination.
7th day.

Revaccination.
7th day.

Revaccination.

From Polyclinic Collection of Drs. Schamberg and Wallis. Wax Models made from Life by Dr. J. F. Wallis.

The medical inspector, especially in times of an epidemic of this disease, should be suspicious of every child having a doubtful vaccination, or on whom there appears a rash similar to smallpox with signs of acute illness. Chicken-pox, varicella, must not be diagnosticated at such times unless every evidence eliminates the possible mild case of smallpox.

The diagnosis is sometimes extremely difficult in the early stages. The greatest importance should be attached to previous and recent successful vaccinations as seen by remaining scars. Pustular syphilis generally has a history of such infection and other specific manifestations on close examination. In chicken-pox, the general symptoms are mild, the prodromal eruption and umbilication of vesicles are absent, and different stages of development of the eruption are present at the same time. Measles is occasionally mistaken for smallpox, but the eruption is papular, more confluent and does not advance to vesicular or pustular stage. There are marked respiratory symptoms and the general symptoms are milder.

Vaccination.—Prophylaxis of smallpox is vaccination. The time to vaccinate is in the first year of life unless there are cases of smallpox in the city, when it should be performed at any age. All people who have come in contact with a case should be vaccinated irrespective of age or time that has intervened since the previous vaccination. The intimacy of the contact is not to be considered. Vaccination has a five-day incubation period and smallpox twelve. Thus there is one week's gain on the disease by an early diagnosis, immediate quarantine, and vaccination of all contacts. Most contacts, if vaccination is successful, will not be infected, or if so, will result in a mild case.

A vaccination is a typical sore on the skin produced by infection with the virus of vaccine, with a resultant white cribriform scar. A sore arm due to infection with streptococci or other germs does not mean a vaccination. The only absolute test of the efficiency of a vaccination to pro-

tect against smallpox is the failure of subsequent vaccinations when properly performed with potent virus.

A successful vaccination can generally be told by the course of the appearance of papule, vesicle, pustule, and after-scar. Vaccination should be repeated once in seven years, and at other times when an epidemic of smallpox exists. This does not mean that the period of protection lasts but seven years. The time varies greatly and may extend over fifteen or even twenty years. The period of seven years simply keeps one within the lines of safety.

The Operation of Vaccination.—Choose a reliable virus, one that is fresh, and within the age limit set by the manufacturer. Heat destroys vaccine virus, therefore it should be kept in a cool place. The best part of the body for the operation is on the left arm, over the deltoid muscle. The leg may be chosen in the case of a female, but this site is more susceptible to infection. The part should be cleansed with soap and water, dried, and washed with alcohol. Then scrape the upper layer of skin with a knife, needle, or scarifier over not more than an eighth of an inch of surface, until there is a slight oozing of serum, not blood. If ivory points are used, the virus is then rubbed into this area. If glycerinated tubes, the virus is blown into the area by means of the tubes or bulb furnished with the virus. Never use the lips to blow on the virus. The arm should remain bare a few minutes to allow the virus to dry, when a few turns of a gauze bandage may be placed around the vaccinated area. Discourage the use of shields.

The physician who performs a vaccination may further protect the operation by painting the area after twenty-four or forty-eight hours with a little of the following solution: Picric acid 4 per cent; tincture iodine 1 per cent; alcohol 95 per cent.

The following is a form of instructions on the after-care of the operation:

CARE OF THE ARM AFTER VACCINATION—READ CAREFULLY.

Vaccination is an important measure for protection against that loathsome disease, smallpox. It is a harmless procedure, provided proper care of the arm is taken. When a vaccination "takes" slight fever and indisposition for a day or so frequently occur at the end of the eighth to the tenth day.

Vaccination of necessity produces a slight wound, provided the proper precautions for cleanliness are carried out. Nearly all of the injuries after vaccination are due to neglect, and harmful germs may get into the wound if the vaccination is left unprotected, scratched, or comes in contact with dirty clothing or the like.

Shields are apt to accumulate dirt beneath them. *They may produce harm, and should not be allowed to remain upon the vaccination, as undue inflammation and infection may result.*

The best protection for a vaccination is given by covering the wound with a half dozen layers of sterile gauze. (Fold cheesecloth to six layers, 3 by 4 inches, wrap it in clean, unprinted paper and bake in the oven for one-half hour.) Gauze treated in the above manner should be applied shortly after vaccination, and should be kept on until the wound dries up. The gauze should be held on the arm by a light bandage or strips of adhesive plaster. Clean gauze, prepared as above, should be applied every few days, according to circumstances, and the person who changes the dressing should thoroughly scrub his or her hands with soap and hot water before changing the dressing. If the gauze sticks to the vaccination and is not easily removed a warm 2 per cent solution of carbolic acid or other equally effective disinfectant should be poured on the gauze to loosen it.

Vaccinated persons may take baths in a tub in a sitting position, but the gauze dressing should not be allowed to get wet, and care should be taken to avoid having the arm bruised or injured in any way.

By paying attention to the foregoing precautions one will avoid trouble following vaccinations.

A vaccination wound, like any cut surface or scratch, may become infected by disease germs if dirt is allowed to enter it.

In the event of any undue inflammation or any illness of the patient, a physician should be consulted.

Legislation.—Most States and cities have some laws which either make vaccination mandatory among school children or give equal powers to the enforcement of such measures.

The school law of Pennsylvania has a special provision for vaccination:

"All principals or other persons in charge of schools as aforesaid are hereby required to refuse the admission of any child to the schools under their charge or supervision, except

upon a certificate signed by a physician setting forth that such child has been successfully vaccinated, or that it has previously had smallpox.

"Any physician, undertaker, principal, superintendent of a Sunday School, sexton, janitor, head of a family, or any other persons or persons named in this act who shall fail, neglect, or refuse to comply with or who shall violate any of the provision or requirements of this act, shall for every such offence, upon conviction thereof before any mayor, burgess, alderman, police magistrate, or justice of peace of the municipality in which said offence was committed, be liable to a fine or penalty thereof of not less than $5, nor more than $100, which said fines or penalties shall be paid into the treasury of such municipality, and in default of payment thereof, such person or persons so convicted shall undergo an imprisonment in the jail of the proper county for a period not exceeding sixty days."

The State of Massachusetts has a statute that has been a school law since 1855:

"A child who has not been vaccinated shall not be admitted to a public school except upon presentation of a certificate granted for cause stated therein, signed by a regular practising physician that he is not a fit subject for vaccination."

One of the most salutary effects of medical inspection has been the enforcement of vaccination laws which previously had been neglected. First inspections by inspectors show, especially outside of large cities, large numbers of pupils unvaccinated. In all of these cases the physicians have insisted upon the observance of the laws and vaccination has become general.

Every child that has received a successful vaccination, or on examination shows a recent mark or signs of having had smallpox, should be furnished with a certificate which should be kept on file at the school.

Form of vaccination certificate:

Physician's Certificate.

.....*192*.....

I hereby certify from personal examination that

..... *Age* .....

Residence .....

is successfully vaccinated, or has had smallpox.

.....*M.D.*

.....*Residence.*

Regulations of the Bureau of Health of Philadelphia.

Authorized by an Act of Assembly
Approved June 18, 1895, and April 20, 1905.

Section 14. All principals, superintendents, or other persons in charge of schools, as aforesaid, are hereby required to refuse the admission of any child to the schools under their charge or supervision, except upon a certificate signed by a registered physician setting forth that such child has been successfully vaccinated or that it has previously had smallpox.

Such certificates of vaccination shall not have been issued sooner than five days after the performance of the operation, nor without personal inspection of the site of the operation by the physician issuing the certificate.

Section 15. All principals or other persons in charge of schools, as aforesaid, are hereby required upon notice from the Bureau of Health to refuse the admission of any child of twelve years of age or over to the schools under their charge or supervision, except upon a certificate signed by a registered physician, setting forth that such child has been revaccinated within a period of four years from the date of its application for readmission, and giving the results of the operation.

The penalty for violation of the provisions of this section is punishable by a fine or by imprisonment.

A medical inspector should never vaccinate a child in school without having obtained the written permission from a parent or caretaker. The following form is suited for obtaining such permission:

.....192.....

BUREAU OF HEALTH: I hereby request the vaccination of

.....

residing at.....a pupil of

.....School.

.....

Parent or Guardian.

Vaccinated.....192

Inspected.....192

Result { Successful / Unsuccessful

.....

Medical Inspector.

Non-takes or unsuccessful vaccinations after several attempts occur occasionally. The extent may be appreciated by the experience in Philadelphia with almost 300,000 pupils there exists but 125 temporary certificates of immunity. These are granted and renewed annually after three new unsuccessful attempts at vaccination. The procedure and form used is as follows:

.....SCHOOL, DISTRICT NO.....192....

To the Director of the Division of Medical Inspection of Public Schools:

Application is hereby made for special permit from the Bureau of Health authorizing the attendance of

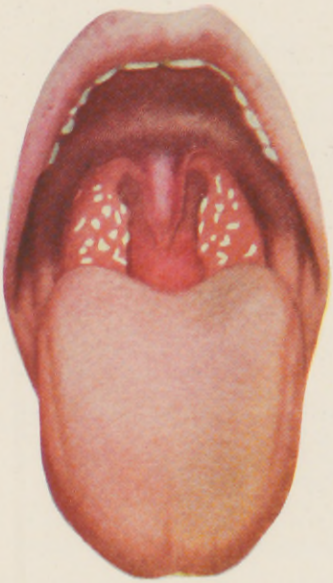
.....

Color.....

Age..... Residence.....

or the remainder of the current school year.

PLATE IV



1

1. Follicular Tonsillitis.

2

2. Diphtheritic Throat.

*Type of permit requested (1. Original. 2. Renewal):

.....

**Certifications of the vaccination operations, on which this permit is based are herewith attached.

Office Record: .....

School Medical Inspector.

Permit issued.....

Permit expires.....

.....

File No..... *Director, Supervisor, or Clerk.*

* See other side of card ** See other side of card.

FORM M 6—APPLICATION FOR PERMIT TO ATTEND SCHOOL (UNSUCCESSFUL VACCINATION)—SCHOOL DISTRICT OF PHILADELPHIA (OVER)

* *Original* permit based on three unsuccessful vaccination operations within the past three months, of which at least the last one has been performed by (or in the presence of) the school medical inspector or other proper Philadelphia health official.

Renewal permit based on one unsuccessful vaccination operation performed during the current school year by (or in the presence of) the school medical inspector or other proper Philadelphia health official.

** These certifications should consist of either:

1. Certification by medical inspector (on Parents' Permit Form M E 5) of unsuccessful vaccination operations if the same have been performed by the medical inspector.

2. Certification of family physician of unsuccessful vaccination operations performed by the family physician, giving date of each such vaccination operation. The certification of the final vaccination operation should be certified with endorsement "in my presence" by the medical inspector.

3. Certification of both medical inspector (on Form M E 5) and of family physician (with dates of vaccination operations) if the family physician has performed one or more unsuccessful vaccination operations and the medical inspector has performed the final unsuccessful vaccination operation.

Diphtheria.—Diphtheria is contracted by intimate contact with discharges from nose and throat of a case of the disease, or a diphtheria carrier (a clinically normal throat with the virulent germs in it), or from articles contaminated by the germs from infected clothing or discharges from the ears, nose and throat.

Food and drink, especially milk, is occasionally a source of infection.

Diagnosis.—Diagnosis is made by the characteristic exudate forming a membrane on tonsils and pharynx or in

nares or larynx. The other diseases resembling diphtheria are pharyngitis and follicular tonsillitis. Where a clinical diagnosis cannot be made, bacteriological cultures should be taken.

All children with sore throat should be looked upon with suspicion, and diphtheria excluded only after laboratory examination shows an absence of the diphtheria bacilli. A trained eye can more often diagnosticate diphtheria from a follicular tonsillitis when exudate is present. A follicular tonsillitis shows dotted white glistening exudate covering tonsils only. These plugs of secretion can be removed from the holes with a probe without bleeding. Diphtheria is found as a dirty gray dull membrane which covers more or less space on the tonsils and spreads to the vault and uvula. Attempts at removal with a probe are difficult, and cause bleeding. All sore throats with or without membrane should be cultured, and the child excluded from the class-room until the results of culture are known. Quarantine in diphtheria must be maintained so long as microscopic examination shows the presence of the diphtheria germs.

Diphtheria Carriers.—Diphtheria carriers are people who show no signs or symptoms of the disease, but in whose throats are the germs of diphtheria. They are most dangerous individuals and can readily transmit the disease to others. When found on a school child, the child is excluded from school, the family notified to isolate the case, and, if no physician is called, the medical inspector should take cultures. When a negative culture is obtained from the nose and throat, the room occupied by the child is disinfected and the child may return to school.

The use of the term "school" legally includes public, parochial, private and Sunday schools.

The following interesting case of class infection occurred as this book was going to press and was inserted because it emphasizes the following facts: The danger of "carriers;" periods of exclusion may extend long beyond the minimum

given by laws; teachers should strictly observe health department rules and notices.

A pupil was excluded for diphtheria on September 24; January 2, returned to school without official return card from health department. Because so long after usual exclusion period the teacher admitted child without consulting inspector. January 7, teacher complained of sore throat. She was excluded by medical inspector and culture proved positive. January 10, class was dismissed until cultured on January 14. This revealed 5 positive cultures including the diphtheria case of September. A new pupil was admitted January 8, the day following the exclusion of the teacher, but was in class two days with the carrier. This new pupil was one of the 5 cases of positive culture.

The bureau of health should notify the school whenever the quarantine period of a case of contagion for any reason extends beyond the usual time. They should specify, a secondary case on premises, cultures remain positive or other assigned reason for extending quarantine.

Cultures.—All health departments of large cities are equipped with a laboratory for examining cultures. These culture outfits, which should be part of the outfit of every school inspector, consist of a package containing two test-tubes—one tube containing a sterile swab of cotton on an applicator—the other, the culture media. The physician rubs the swab of cotton over the diseased area and then rubs it on the surface of the culture medium without breaking the surface. The cotton plug is returned to the tube and with the required data of information the outfit is sent to the laboratory. As it takes twenty-four hours for the result of such examinations, the physician should make every effort to diagnosticate the case on clinical signs and symptoms.

Antitoxin.—There should be no need to enter into any discussion as to the value of antitoxin as a preventative, and curative agent in diphtheria. It is the delay in its use that endangers the life of the patient. In the Philadelphia

Hospital for contagious diseases no case has died that has received a dose of antitoxin in the first twenty-four hours of the disease. Before antitoxin was discovered the death rate from diphtheria was 30 to 50 per cent. Since the use of antitoxin the mortality is but 10 per cent. Many cities furnish antitoxin free, and upon request, medical inspectors to administer it. Since February, 1913, New York City no longer permits the administration of antitoxin by the inspectors, although the serum is furnished free upon request.

Toxin-antitoxin as an immunizer has passed the experimental stage. An attempt at wholesale immunity of a community is practical by the use of toxin-antitoxin for the stimulation of active immunity. In New York, 10,000 children who were so rendered remained immune after a period of eight years. Similar reports have been received from other cities. Previously immunizing for diphtheria was given only upon consent and actual contact with the disease. Antitoxin was here used, and an immunity granted for a limited period. Of course toxin-antitoxin because of the length of time required does not take the place of antitoxin needed for immediate protection.

Rather than assigning the duty of immunizing to the school physicians, it is better accomplished by those in charge of communicable diseases or child hygiene physicians, who will endeavor to immunize all infants and so offer a later protection.

Active immunity takes from three to six months to develop following three injections of 1 cc of toxin-antitoxin given at weekly intervals. These injections are given into deep tissues of the arm at the insertion of the deltoid. The reaction to recent products is negligible.

In schools, immunization by toxin-antitoxin is not practical when diphtheria exists, but the antitoxin must be used to bridge over the epidemic.

In Chicago in 1920, toxin-antitoxin was given to all children in the kindergardens and first grade whose parents

consented. The number of cases having reaction were few. 13,118 children were injected, 68.5 per cent received the three injections. In 1921, 16,880 children were given the treatments and only 2 cases of diphtheria developed among them.

Schick Test.—This is used to determine the presence or absence of immunity to diphtheria and has proven to be reliable and practical. It is performed by injecting into the superficial layers of forearm one-fortieth the minimum lethal dose of diphtheria toxin freshly diluted in 0.2 cc of normal salt solution. A control test is placed on opposite arm with toxin heated to 75° C. for five minutes prior to dilution.

Scarlet Fever.—Scarlet fever is more often found by the school physician in the early stages when the child has a mild erythema and pharyngitis with accompanying early symptoms of vomiting and fever or in the stage of desquamation. A child vomiting in the class-room should be looked upon with suspicion, carefully examined, and, if necessary, excluded for a day or so.

Scarlet fever is to be diagnosticated from pneumonia, pharyngitis, indigestion, measles and diphtheria in early stages. It is the mild cases with few symptoms that return after an absence of a few days from school, infect many others and cause epidemics. All cases must be examined by an inspector when the case is declared terminated by the physician. Examination is especially made for discharges from nose and ears. Desquamation of soles of feet and palms of hands takes place later than other parts of the body. The infectiousness of the desquamation is a muted one, and in many cities this stage when free from discharges from nose and ear is ignored by the authorities in terminating a case.

Procedure of inspector when a case of scarlet fever occurs in a pupil of a school depends on the stage of the disease when the case is found. An acute case or one which has been seen within the first ten days or two weeks necessitates

examining the throats and skin of all the pupils in the class. If later than two weeks the exclusion of the child is sufficient. In examining the class special attention should be paid to discharging ears. All returning absentees should be examined before readmission.

Disinfection of class-room by use of soap, water and a disinfectant in the water may be resorted to when an active case has been taken out of the room.

FIG. 47.—Desquamation of the hands in a case of scarlet fever.

In diphtheria the same rules apply except in acute recent cases, a culture should be taken of all the pupils and teacher of the class. Positive cultures should be excluded until proven by laboratory diagnosis negative. The Schick test and toxin-antitoxin may prove valuable in an epidemic.

Teachers in a class-room which has been dismissed for the day should not teach in another class. They may per-

form some administrative work in a room where they do not come in contact with pupils.

Measles.—No other infectious disease is more frequently found in the schools by the physicians than measles. This is partly due to the ignorance of some parents in believing measles not serious, and that all children must get it, and partly to their mistaking the respiratory symptoms as a mere "cold." A pupil with "watering eyes," lacrimation, sneezing, coryza, and cough should be looked upon with suspicion. By these symptoms a diagnosis can often be made previous to the rash appearing and the child can be excluded. This disease more than any other one of childhood, plays havoc in a school by its rapid dispersion. Koplik's spots may be seen, but are more often overlooked. The characteristic papular eruption beginning on the forehead, neck and wrists, together with respiratory symptoms, cannot be mistaken for any other disease. Diagnosis in the early stages must be made from scarlet fever and diphtheria.

The infection, is present in a very intense degree at the first onset of the catarrhal symptoms, and as these precede the appearance of the rash by at least three days, this period passes in most cases before the diagnosis is made.

Only one means of protection exists for any but a few endowed with immunity, and that is a previous attack. That the fire is generally lighted in the school is shown by many cases under school age occurring only after the oldest child begins to attend school. New York City is experimenting with a serum to be used on children of preschool age or earlier. It is the hope that so immunizing a large part of the child population will prevent future epidemics of measles.

Recording on registration card on enrollment—what infections the child had previous to entrance is useful in guiding an inspector in judging the extent of immunity to expect.

Quarantine for measles should be instituted as early as

possible. This must be continued for sixteen days. The same period of exclusion should be enforced on those of the family exposed and who have not previously had measles.

Rubella, German Measles.—Rubella, German measles, occasionally found at school, must be diagnosticated from scarlet fever. Rubella is much milder in its symptoms, the rash is papular instead of the erythema, and there is a swelling of the cervical glands.

Varicella.—Varicella, chicken-pox, next to measles, is one of the contagions most frequently met with at school. The child is seldom sick enough to remain home. The rash, varying in size, in all stages of papules, vesicles, pustules and crusts, superficial in character, makes a clinical picture characteristic of this disease. Care must be exercised in diagnosis when smallpox is prevalent.

Pertussis.—Pertussis, whooping-cough. Teachers are apt to send to the medical inspector, with a diagnosis of whooping-cough, every child that coughs. The frequency of these mistakes should not make the physician any less alert in diagnosticating these cases. If the child has the typical "whoop," with vomiting, etc., the diagnosis is easy; but to avoid unjustly excluding a case of bronchitis for whooping-cough requires skill on the part of the inspector. The typical cough can be produced in a suspicious case by having the child run up and down the playground a few times. Cases of whooping-cough are excluded from school for a minimum of twenty-eight days or until the cough has ceased. The other children in the family, if unaffected, are not excluded.

Methods employed for quarantining cases of whooping-cough have very little effect in a disease which may sometimes last two months and where fresh air is a necessity. Infection is in the early stages.

Serobacterins for immunity have been used but are in an experimental stage.

Mumps.—Mumps is a highly contagious disease, most prevalent in children. In Philadelphia in 1921, the schools

reported 701 cases; in 1923, 71 cases. This like other diseases occurs in cycles.

The disease develops in two to three weeks after exposure. The early symptoms are fever with pain below the ear on one or both sides; a slight swelling below one ear may be noticed. In a day or two there is a decided enlargement

FIG. 48.—Mumps.

of the neck and side of the cheek, which spreads to the other side of the face. The swelling persists for seven to ten days and gradually subsides. The typical swelling of the parotid gland is easily diagnosticated. Abscess from carious teeth can be diagnosticated by the location of the swelling, and the presence of decayed teeth.

Quarantine for mumps should be sixteen days from the date of reporting to the bureau of health. Children exposed to the disease need not be excluded from school.

Syphilis.—Syphilis in its hereditary form is more common among children than is accredited to the disease. The eruption when present is rarely on the uncovered part of the body. The child may show the anemic, undeveloped appearance characteristic of some cases. Iritis and keratitis may be the most prominent signs; Hutchinson's teeth and frequent attacks of nasopharyngeal catarrh may be found. Glandular enlargement is often present. This disease is not uncommon among the subnormal and mentally defective children.

Tuberculosis.—The relation of the school physician and cases of tuberculosis among school children is one that does not necessitate an extended study in a volume of this kind. The school medical officer is not permitted to undress a child to make a thorough physical examination, nor has he the means at his command for laboratory examinations. He can, however, label a child "suspicious tuberculosis," and refer the case to the family physician or a dispensary for a thorough examination and treatment. The school physician may recognize the "predisposed" pupils and advise thorough examination by family physician or at tuberculosis clinics. He may interest the parents to a more healthful outdoor life for the child and the nurse may investigate home conditions and remedy many defects that may benefit the child. Cases of tuberculous joint or bone disease are met with in various stages and should be referred for treatment to one of the orthopedic dispensaries. All cases of active tuberculosis in children are excluded by law, in many States, from attendance at school. Some of these children can receive an education and at the same time improve their physical condition by attending schools maintained in sanatoriums. The active tuberculous child, however, has no right to attend any school. The physicians should be

acquainted with all the early signs and symptoms of tuberculosis and try to recognize the early cases and those predisposed to the disease. He has the opportunity of playing an important part in the campaign for the prevention of tuberculosis.

The time between infection and signs and symptoms is unknown and indefinite. We must train ourselves to recognize the earliest signs of positive infection but must not err in pronouncing a case when there are no adequate grounds. It may be good policy to treat as a case but reserve the diagnosis, and school physicians when confronted with borderline cases should make several examinations and observe the child over a period of time.

Learn the physical status of a normal child's chest, with its wide variations: Do not be deceived by standards of height and weight. Chests are not alike nor ideal to the ear and percussing fingers of an examiner. Weigh carefully all clinical, laboratory, roentgen-ray and history data.

Health officials must not be misled into believing the inspectors are careless or negligent in diagnosing tuberculosis because few cases are found and reported. Careful analysis of reports throughout the United States by careful workers proves that actual active tuberculosis is not common in children.

In Pennsylvania in 1915, in fourth class cities there were examined 400,000 school children and 330 cases of tuberculosis reported; in third class cities, out of 12,000 pupils, but 35 cases were found.

The following for Pennsylvania shows number of deaths from tuberculosis at all ages, and children aged five to ten years.

	1910.	1911.	1912.	1913.	1914.	1915.
Total at all ages .	8595	8832	8251	8107	8444	8851
Aged five to ten years	69	78	72	68	54	56

In Philadelphia during the term 1921–1922: Out of a school population of 250,000 there were diagnosed and

reported to the Bureau of Health but 7 cases of active tuberculosis. Among 900 cases visited for Bureau of Compulsory Education, 8 cases were found and recommended for special class: There are 148 tubercular children enrolled in open-air classes.

City of Chicago reported in 1919, 35 cases of tuberculosis among 516,692 pupils inspected.

Standards for the Diagnosis of Pulmonary Tuberculosis in Children Promulgated by the National Association for the Study and Prevention of Tuberculosis.—In a certain number of cases the conditions establishing a diagnosis of pulmonary tuberculosis in children are identical with those which obtain in adults. In such cases, the standards of diagnosis and classification are the same as those set forth by the National Association for the Study and Prevention of Tuberculosis.

In a very large number of cases, however, the conditions in children differ materially from those in adults and for these the following procedures and standards are recommended:

History.—The following points should be covered in obtaining the history. Some of them, as indicated by italics, are more important than others. Emphasis should be laid upon the combination of several of these conditions, it being understood that all of them are not essential and that no one of them alone establishes a diagnosis.

Intimate exposure to infection, especially if prolonged.

Delayed convalescence from illness.

Malnutrition: indicated by underweight for height and age, loss of or failure to gain in weight, and pallor.

Cough.

Expectoration.

Hemorrhage

Pleurisy.

Dyspnea.

Night sweats.

Digestive disturbances.

Ear discharge.

Constitutional Symptoms.—In every physical examination, the possible occurrence of all of the following constitutional symptoms should be considered by the examiner. In consideration of their importance, the same rule should be followed as noted under "History."

Changes in disposition, shown by lassitude and fretfulness.

Malnutrition.

Elevation of temperature, acceleration of the pulse, acceleration of the respiration.

Cough.

Expectoration.

Hemorrhage.

Pain.

Dyspnea.

Night sweats.

Digestive disturbances.

Physical Signs.—The following physical signs should be investigated by the usual method of physical examination.

Persistent and persistently localized râles, by which is meant:

(*a*) Râles about the nipples; that is, anywhere between the fourth and sixth ribs, the border of the sternum and the anterior axiliary line.

(*b*) Râles anywhere along the border of the sternum, or in the region of the apices, as in adults. These, however, are infrequently found. These râles may be heard during inspiration or expiration, or after a cough. In many instances they can be elicited only by the cough.

(*c*) Râles limited to a considerable part or the whole of any one lobe. If these are associated with a positive tuberculin test and persist over a considerable period of time, they should be regarded as tuberculous, despite the fact that in association with enlarged tonsils or adenoids similar signs may occur. However, in the absence of any means of definitely interpreting these signs and particularly with a history presenting evidence of exposure to tuberculosis,

it is wise to give children the benefit of the doubt and to keep them under observation until a definite diagnosis can be made.

Additional abnormal signs elicited by the usual method of examination; such as changes in resonance and breath sounds.

Any glandular, joint, bone, muscular, cutaneous, ocular or aural abnormalities, which are of value as corroborative evidence of the pulmonary findings.

Essentials for the Diagnosis of Pulmonary Tuberculosis.—1. Distinct, persistent and persistently localized adventitious signs (râles) in the chest.

2. Reaction to a tuberculin test. This reaction consists of an area of hyperemia not less than 5 mm. in diameter occurring in forty-eight hours after the application of 100 per cent Kock's Old Tuberculin by the cutaneous method of von Pirquet.

Exceptions.—1. Given an unquestioned and otherwise unexplained hemoptysis with a positive tuberculin reaction and with or without a definitely positive radiograph, a diagnosis of pulmonary tuberculosis is to be made.

2. Given a radiograph which shows unmistakable mottling well into the pulmonic fields without any sharp outline suggestive of calcification with a positive tuberculin reaction in children under three or four years of age, even if constitutional symptoms are absent, and in older children who have frequent cough or rapid pulse or fever, a diagnosis of pulmonary tuberculosis is to be made.

Notes.—1. Cough will be present in most instances, but its absence does not negative a diagnosis of tuberculosis when the essentials above mentioned are present.

2. Fever, to some degree, will also be present in most instances during some period of the disease. Temperatures in young children should be taken by rectum and observations should be made twice a day, at frequent intervals and for at least a month, before the absence of fever is determined. All other causes of fever must be carefully excluded.

Mouth temperature records in children under eight years of age are very unreliable.

3. No patient with fever and persistent physical signs should be considered free from tuberculosis until the tuberculin test has given a negative reaction three successive times within a month. In the interval patients are to be considered as suspects under observation. In rare instances, congenital syphilis simulates tuberculosis and a Wassermann test should be made in all cases with a suspicious history.

4. Examiners are reminded that undue importance should not be ascribed to the slight vocal intensification and respiratory modifications, or to slight alterations in the percussion note, so frequently present in children, especially at the apices, unless they are persistent.

Suspects.—In a certain group of children, an immediate definite diagnosis is impossible and such children should be kept under continued observation. Physical signs may be absent or indefinite, but there must be one or more constitutional symptoms or items of the history indicated above as significant. Exposure to infections is here especially important.

PART IV.

PHYSICAL DEFECTS.

GENERAL CONSIDERATIONS.

While the essential object of school inspection is the detection of contagious diseases among the pupils, of no less importance is the diagnosis and correction of physical defects. The medical inspector in his routine visits to the schools, has sent to him by principal, teachers, and nurse, pupils who have some signs or symptoms suspicious of a contagion, and those who have evident physical defects, which seem to hinder their physical and mental development. These cases are also detected by the physician in his class-room inspections and thorough individual examinations. The physical status of each pupil, at least once a year, is noted on record cards described under the section on "Records and Record Keeping."

After the medical inspector has visited his schools and disposed of the cases that may be sent to him, he proceeds to the school where he intends making complete physical examinations. Here he examines 10 or more pupils and records the results and recommendations. The inspection for evidence of successful vaccination is best done at the beginning of the school term for all pupils. Thereafter, all newly admitted pupils are examined on a certain day each week, agreed upon by the principals and the doctor. The physical examinations are preferably started in the highest grades and proceed to the lower. If the older pupils are promoted to other schools their examination has been

accomplished, and the records of physical examinations may be transferred with the pupil. Any defect noted and not corrected may then be followed up by the physician in such school.

Variations in the percentage of cases found with the different defects is noteworthy in various cities and even by different inspectors in the same city. A recent survey of 70 physicians performing school inspections, gave the following results. Alongside of each defect is the average percentage which the author believes should exist.

TABLE XVII.—VARIATIONS OF DEFECTS NOTED 1923.

	Variations from	Should be about
Defect of vision	1.5 to 24.0	12.0
Tonsils	2.0 to 35.0	8.0
Nasal obstruction	1.0 to 22.0	3.0
Hearing	0.2 to 1.5	0.5
Teeth, 1 to 3	8.0 to 49.0	30.0
Teeth, 4+	3.0 to 28.0	5.0
Stoop shoulders	0.1 to 19.0	10.0
Anemia	0.5 to 25.0	5.0
Heart	0.0 to 3.5	0.25

The frequency of the various defects found in the schools of different cities is of interest as well as a guide for comparison of results.

TABLE XVIII.—CITY OF PHILADELPHIA. SCHOOL YEAR, 1921 TO 1922. GENERAL SUMMARY.

School Enrollment.

Number of pupils in elementary schools (regular, kindergarten and special classes) and junior high*	222,798
Number of pupils in high schools (including normal school) and trade schools*	25,654
Number of pupils in continuation schools*	1,755
Number of school buildings (main building and annexes on same lot classified as one school)	275
Number of class-rooms disinfected	639
Children in ocular classes	114
Children in nutrition (health instruction) classes	562
Children in open-window classes	194
Children in open-air classes	148
Children in crippled classes	300

* Average number belonging for the school year.

Work of Supervisors.

Visits made by supervisors (routine visits to schools)	3,442
Visits made by supervisors (homes and miscellaneous)	494
Special physical examinations made by supervisors	1,693
Number of reports on work of inspectors	136
Special mental examinations	103
Number of visits to central office	932
Children seen at special clinic for mentally deficient children	166

Work of School Physicians.

Number of visits by assistant inspectors	36,893
Pupils sent to inspectors by teachers	231,860
Routine physical examinations	230,528
Number of pupils found physically normal	74,009
Special examinations (rapid examinations, mostly by classes)	276,362
Number of defects recommended for treatment	248,360
Proportion of physical defects corrected consequent to recommendations, per cent	49.1
Number of exclusions from school	11,069
Number of throat cultures taken	3,833
With positive results	242
Vaccinations performed	1,762
School buildings inspected (sanitary)	329
Children visited at their homes at request of Bureau of Compulsory Education	1,061

City of Philadelphia, 1922.

Physical Defects Recommended for Treatment.

Eye.		*Nose, Throat and Mouth.*	
Eye strain	19,659		
Squint	1,811	Hypertrophied tonsils	30,565
Conjunctivitis	836	Nasal obstruction (chronic)	16,128
Stye	851	Nasal catarrh (chronic)	2,515
Blepharitis	1,865	Pharyngitis (chronic)	44
Foreign body in eye	111	Laryngitis	55
Corneal opacity	27	Epistaxis	29
Keratitis	13	Stomatitis	11
Ptosis	18	Cervical adenitis (simple)	334
Cataract	28	Cleft palate	21
Nystagmus	17	Tongue-tie	12
Miscellaneous*	40	Miscellaneous*	17
	25,276		49,731

* Consisting of items numbering less than 10 each.

Ear.

Defective hearing	1,045
Otitis media (chronic suppurating)	916
Otitis media (acute)	661
Impacted cerumen	64
Miscellaneous*	13
	2,699

Teeth.

Carious teeth (children with 1 to 3)	93,183
Carious teeth (children with 4 or more)	31,609
Irregular teeth	2,480
Alveolar abscess	151
Unclean teeth	144
Pyorrhea	591
Toothache	16
	128,174

Orthopedic.

Stoop shoulders	9,043
Scoliosis	772
Monoplegia (spinal) (upper limb)	11
Monoplegia (spinal) (lower limb)	65
Flat foot	418
Deformed limb (from old arthritis)	17
Kyphosis (from old arthritis)	11
Torticollis	17
Miscellaneous*	37
	10,391

Nutrition.

Poor nutrition and anemia	12,871

Heart.

Endocarditis and myocarditis (chronic)	1,652
Tachycardia	5
	1,657

Nervous System.

Nervous weakness	755
Chorea	22
Mental deficiency	285
Miscellaneous*	24
	1,086

Gastro-intestinal.

Miscellaneous*	11

Skin.

Pediculosis (not excluded)	13,036
Wounds (not infected)	1,761
Wounds (infected)	1,127
Dermatitis (not pustular)	1,846
Dermatitis (pustular) and simple impetigo	1,212
Eczema	856
Furunculosis	67
Tinea circinata (not excluded)	640
Offensive and unclean	425
Tinea tonsurans (not excluded)	218
Acne	368
Burns	27
Herpes	42
Rhus poison	30
Verrucæ	13
Alopecia	11
Psoriasis	17
Miscellaneous*	30
	21,726

Acute Illness and Accidents.

Acute illness (including headache, indigestion, etc.)	2,922
Sprains	104
Fractures	28
Miscellaneous*	6
	3,060

Miscellaneous.

Bronchitis	75
Not vaccinated (parents notified)	453
Speech defective (not mentally deficient)	1,025
Goiter	442
Dysmenorrhea	190
Hernia	35
Miscellaneous*	50
	2,270

* Consisting of items numbering less than 10 each.

TABLE XIX.—CITY OF CHICAGO—WORK OF SCHOOL HEALTH OFFICERS.

	1919.	1920.	1921.
Average numbers of school health officers employed	143.4	126	126
Total number of visits to schools	89,748	78,707	82,205
Number of children inspected for contagious diseases	924,004	940,290	793,375
Number of superficial preliminary examinations	1,665,948	1,745,762	1,510,105
Number of throat cultures	18,873	15,228	7,950
Number of smallpox vaccinations	92,593	45,744	141,228
Number of Schick tests	245	0	0
Number of children given toxin-antitoxin injections	4,656	34,059	16,880

During the three-year period, 1919–1921, inclusive, the number of physical examinations of children in the public schools was comparatively small for the reason that the time of the staff was spent doing contagious disease work in the schools and assisting the field health officers with some of the field work during periods when this was heavy. Smallpox vaccinations and active immunization of school children against diphtheria with toxin-antitoxin also consumed a good deal of time.

TABLE XX.—PHYSICAL EXAMINATIONS OF PUPILS IN SCHOOLS, 1919–1922.

	1919.	1920.	1921.	1922.
Number of pupils examined	92,899	58,560	49,068	125,577
Number of pupils found defective	56,486	40,875	35,494	82,113
Native born found defective	51,437	37,852	31,969	
Foreign born found defective	5,049	3,023	3,525	
Total number of defects found	161,984	97,082	82,583	
These defects were divided as follows:				
Malnutrition	8,607	4,897	3,599	8,896
Anemia	8,483	5,010	3,609	9,041
Enlarged glands	22,329	12,503	8,194	27,666
Goiter	3,567	1,741	1,336	5,402
Nervous diseases	604	261	329	833
Cardiac diseases	755	507	332	835
Pulmonary diseases*	1,413	608	653	3,305
Skin diseases	856	450	586	1,360
Orthopedic diseases	596	596	285	703
Rachitic type	536	237	240	753
Defective vision	13,440	9,434	8,753	18,086
Other diseases of eye	1,892	1,419	1,168	2,279
Defective hearing	988	822	975	1,191
Discharging ear	681	376	747	
Nasal breathing	3,857	2,002	1,792	4,487
Palate defects	1,115	464	498	2,176
Teeth defects	47,730	30,244	25,363	52,179
Tonsils hypertrophied	29,427	17,336	15,722	39,486
Adenoids	13,682	8,006	7,734	19,320
Mentality defects	426	0	566	834
Advised to seek treatment and referred to the nurse for treatment	61,084	41,553	31,507	
Transferred to fresh-air rooms	1,433	898	241	

* Pulmonary diseases for 1922 included 3127 suspicious tubercular cases.

TABLE XXI.—STATISTICS OF SCHOOLS, NEW YORK.

Number and Registration of Schools and Inspectors and Nurses Assigned Thereto During the School Year 1921–1922.

	Manhattan.	Bronx.	Brooklyn.	Queens.	Richmond.	Total.
Number of public schools*	198	60	190	107	39	594
Registration	316,786	119,442	345,885	82,955	19,262	884,330
Number of parochial schools	76	31	75	29	9	220
Registration	55,748	17,371	62,195	17,087	2,742	155,143
Number of kindergartens	30	0	19	0	21	70
Registration	1,340	0	900	0	1,123	3,363
Total number of schools	304	91	284	136	69	884
Registration	373,874	136,813	408,980	100,042	23,127	1,042,836
Number of school medical inspectors	37	11	33	10	3	94
Number of school nurses	84	28	86	20	7	225
Schools per inspector	8.2	8.2	8.6	13.6	23.0	9.4
Schools per nurse	3.6	3.2	3.8	6.8	9.8	3.9
Pupils per inspector	10,104	12,437	12,393	10,004	7,709	11,094
Pupils per nurse	4,450	4,886	4,755	5,002	3,304	4,634
Physical Defects Found in School Children Examined by Medical Inspectors.						
Number of physical examinations made	114,837	35,042	105,805	29,175	9,895	294,754
Number found needing treatment:						
Number with defects other than of teeth only	41,300	12,552	37,497	7,227	2,035	100,611
Number with defects of teeth as only defect	29,595	13,125	44,849	11,111	3,893	102,573
Defects found:						
Defective vision	14,284	4,431	11,526	2,618	541	33,400
Defective hearing	560	186	909	416	38	2,109
Defective nasal breathing	16,590	4,570	14,007	2,209	446	37,822
Hypertrophied tonsils	18,223	5,022	16,435	3,534	1,056	44,270
Pulmonary disease	244	28	146	32	16	466
Cardiac disease	1,370	739	1,466	231	156	3,962
Nervous affections	616	374	773	112	46	1,921
Orthopedic defects	859	211	861	618	68	2,617
Malnutrition	21,509	5,265	16,584	2,402	490	46,249
Defective teet.	59,517	21,541	75,124	13,218	4,890	174,290
Number reported treated	27,288	8,035	16,953	6,395	376	59,047

Method of Inspecting Pupils.—The physician should have a routine method of conducting the physical examinations. Besides his other duties, he is supposed to make from 10 to 20 physical examinations each day. These examinations, depending upon the ability of the inspector and the thoroughness of the inspection, take from ten to twenty minutes for each pupil.

As the child enters the room, the inspector notes his gait and standing posture. In a low tone he asks the pupil's name, age, address, etc., and by the promptness of the reply or the pupil asking to have the question repeated he gets a preliminary idea of the condition of hearing and sometimes mentality. He observes any abnormalities of structure, difference between right and left sides of the body; facial expression, whether mouth-breather, etc. He notes color of the skin, presence of anemia, jaundice, desquamation, rash, and cleanliness by observing face and neck from front and sides. It is not unusual to find a ringworm back of the ear or on the back of the neck. He observes the hands on both sides for rash, desquamation and cleanliness, also condition of the nails. As these observations are made while the child faces a good light near a window, the same position is used to examined mouth and throat. When the child opens its mouth, the inspector notes the condition of the mucous membrane and teeth; the presence of an odor may indicate uncleanliness of mouth, carious teeth, or nasopharyngeal catarrh. The tonsils are inspected to see whether they are hypertrophied or if an exudate is present; then the uvula, to see if it is elongated or if signs of nasopharyngeal catarrh exist. Mouth-breathing or signs of nasal obstruction are noted. Ears are next observed for impacted cerumen or any discharge. Eyes are inspected for any of the inflammatory diseases of the conjunctiva, cornea, or lacrimal apparatus and the presence of strabismus or ptosis of eyelids. The child is requested to stand erect with feet together and hands to the sides, while the physician notes any deformi-

ties or orthopedic defects by viewing the child from all sides. Having obtained all possible data from a thorough inspection, the physician then tests the hearing and vision. The defects found by the school examiner are referred for treatment to the family physician or dispensary. Care should be exercised in statements of defects and diseases, as a great number of errors in diagnoses sent to members of the medical profession lower their estimate of the proficiency of the corps.

The eyes and ears are possibly the only parts of the body which receive an examination other than that of mere inspection. A few cities attempt to examine the chest and use stethoscopes, but information from a hurried examination through clothing is worthless.

Acuity of Vision.—In testing, the child is placed with his back to the light and free from any reflection from the surface of the test card. Covering the eye not under examination, generally the left, the child is asked to recognize the letters beginning with the largest type. If the child reads correctly all the letters including those on the line marked 20 feet, and he is 20 feet away, the vision for that eye is recorded $\frac{20}{20}$ or normal. If he recognizes no farther than the 40 foot line, then vision is recorded $\frac{20}{40}$, etc. The same method is adopted if meters are used for recording the acuity. If the child cannot see even the largest letter on the card, he is brought nearer until he can distinguish the top letter, when the acuity is noted by the distance of the child in feet or meters from the card used as numerator and the designated type read as the denominator. The left eye is then tested in the same manner, after covering the right eye.

A more complete discussion and criticism of testing vision and test cards will be found under the chapter on the eyes.

Acuity of Hearing.—An accurate, scientific study of the acuity of hearing can be obtained by using one of the audiometers designed for such purposes. These instruments for school inspection are almost unknown outside of the psy-

chological clinics and the dispensaries for diseases of the ear. The whispered voice or watch test is satisfactory, and preferred by most physicians. The child stationed about 15 or 20 feet away and with his back toward the physician, is instructed to cover one ear completely. The physician whispers in a distinct, clear voice, words, numbers, or letters, which are to be repeated by the pupil. Each ear is tested separately, and it is sufficient to note hearing, right or left ear, defective or normal.

The watch test consists in standing back of the pupil, and with one ear tightly closed he is requested to tell when he hears the tick of the watch held before the open ear.

THE EYES.

Diseases and Their Prevalence.—The examination of the eyes of school children should receive special attention from the medical examiner, as no other organ of the body has a greater influence on the child's welfare. The examination should include the eyes and their appendages, for inflammatory and non-inflammatory diseases, and defects of vision. About 10 per cent of the eye cases found are diseases of the eyes, chiefly inflammatory, and the remaining 90 per cent are defects of vision.

Any of the many diseases described in text-books on diseases of the eye may be found among school children, but there is little need of the school examiner having an intimate knowledge of the signs, symptoms and diagnosis of all of these diseases. It is sufficient to be able to distinguish the normal from the abnormal, and to recognize the common prevalent diseases and refer the cases to a competent ophthalmologist.

Diseases may affect the eyeball, the eyelids, or the lacrimal apparatus, and those defects which can be diagnosticated by inspection are within the realm of a school inspector. Where defects exist in the hidden structures accessible

only by the ophthalmoscope, as in the choroid, retina and nerve head, they are likely to be overlooked. Several diseases of the eye show little or no outward signs of the disease, and may be recognized only by the careful examination of a trained specialist. Inflammatory diseases of the eye recognized by redness, a watery discharge, and photophobia, or inability to stand light, should be cautiously labeled. The teacher's diagnosis of "conjunctivitis," "pink eye," "inflamed eye," etc., may be a most serious case of iritis or glaucoma. Sometimes the belittling of an "only inflamed" eye is the cause of slowly healing corneal ulcers.

Reports from various cities tell of finding acute conjunctivitis, chronic conjunctivitis, keratitis, choroiditis, cataract, pannus, etc., and as the physicians are more or less specialized on this subject, varied the list of subheadings. It is impossible to train each medical inspector to be a specialist in all branches of medicine.

In cities or towns where no physicians are employed, the nurses or teachers who perform the work should be acquainted with the gross anatomy and appearances of a normal eye, but need not burden their memories with definition, diagnosis and pathology of the various diseases. They should also be intimately acquainted with the rules of hygiene for the eyes, should teach such rules on all possible occasions, and see that all dangerous contributing causes are removed from the school-room. The examination of the child should be thorough enough to recognize defects in the acuity of vision, inflammation of the eyes, swelling, edema, or puffiness of the lids, as well as other symptoms signifying disease. It is well to remember that these signs may mean more than a mere local affection, and may be a symptom of a more serious disease.

An acute conjunctivitis with "watering" of the eyes, associated with catarrhal symptoms, may be prodromal of measles, and occasionally in the early stages of scarlet fever or chicken-pox there is an injection of the conjunctiva.

Redness of the eyes with subconjunctival hemorrhages may indicate the presence of whooping-cough, and the diagnosis may be confirmed by hearing the typical cough. Scarlet fever and other acute exanthemas have associated fever and characteristic eruptions.

Conjunctivitis must be diagnosticated from trachoma, a contagious inflammatory disease of the lids. Trachoma is diagnosticated by a characteristic follicular or trachoma body appearance most marked on the conjunctiva of the upper lid.

All forms of conjunctivitis with muco-purulent secretion is contagious to a greater or less degree, and requires exclusion from school.

Most of the cases of trachoma found in the public schools have been diagnosticated as conjunctivitis, and the true condition has been later recognized by specialists. This is partly due to the school examiner confining his inspection to the lower lid, and finding no trachoma granules. Many of the cases of trachoma show little outward signs of inflammation and can be detected only upon everting the upper lid. A peculiar drooping of one or both lids, a narrowing of the slit, and a puffiness of the upper lid in an Italian or Russian child may lead one to suspect the presence of trachoma.

The cornea should always be transparent, smooth and glistening. Keratitis or corneal inflammation makes the membrane cloudy or hazy. Corneal ulcers often begin at the margin or limbus and show as an irregularity in the otherwise smooth surface. Ulcers when overlooked may cause serious damage to the eye and permanent impairment of vision. Hazy or clouded cornea may signify a serious disease of the eye.

Unequal pupils or failure to react to light or accommodation are abnormal signs and may signify some cranial trouble. If one pupil is dilated, before looking farther for the cause the examiner should ascertain if the child has been using drops.

Puffiness of the eyelids or around the eyes may signify an organic disease of the kidneys or heart, or may be due to eye-strain or loss of sleep. Repeated attacks of inflamed eyes, styes (hordeolum), crusts, and inflamed edges of lids generally denote the need of correcting lenses. It must be borne in mind, however, that vermin, head-lice, or uncleanliness often cause crusts and inflamed edges of the lids, and can be verified by examining the scalp.

If an eye becomes suddenly inflamed, the examiner should look for a particle of dust or other foreign body on the eye or conjunctiva of the lid before seeking some more serious cause.

The treatment of a simple acute conjunctivitis or inflamed eye where there is no complication, or where a foreign body has been removed, consists in flushing the eye with a solution of boric acid (a teaspoonful in a glass of warm distilled water). This can be done with an eye dropper or the child can use an eye bath or eye cup. These small glass cups are inexpensive and can be purchased from any druggist.

Method of Examining Eyes.—The medical inspector should be most careful in his inspection of the eyes of children, as no other defect has a more important bearing on their education. Failure to recognize defective vision or some disease of the eye may mean failure to aid a subnormal or mentally defective pupil.

It is unnecessary in a volume of this size to give the definition, pathological anatomy, and symptoms of the various diseases of the eyes. Where a school physician is unacquainted with the subject he can readily refer to one of the many good text-books on the subject. The following facts, however, are important and should be known by every school inspector.

Diagnosis of diseases is made chiefly by inspection and defective vision by the use of test cards.

Inspection. The eyeballs should not be so prominent as to protrude beyond the sockets (exophthalmos). There

should be no drooping of one or both eyelids (ptosis). The margins of the lids should show no crusts, redness or swelling (blepharitis). The conjunctiva of the eye or lids should not be red, injection denotes conjunctivitis, and small papulo-pustular eruption on the edge of the lids constitute styes (hordeolum). Pupils in normal eyes are equal and the cornea and all media are clear and transparent. The surface of the cornea should be smooth and regular and the curvature in all directions should be the same. Breaks or irregularities of the surface of the cornea may be due to ulcers, and haziness or cloudiness due to keratitis. Growths on the conjunctiva may be due to pterygium, pinguecula, pemphigus, or tumor. Irregular shape of pupil, which in the normal eye is perfectly round, may signify a former inflammation of the iris. Iritis or inflammation of the iris is accompanied by a reddened conjunctiva. A normal lens should show no signs of opacity.

The lacrimal apparatus comprises the lacrimal glands with their ducts situated at the upper and outer angle of the orbit and its drainage system is placed at the inner edge or canthus of the eye. The passageway for the tears is through the nasal duct emptying into the nostrils. The eyes are kept moist by the secretion of tears from the glands, and all surplus secretions are carried through this duct to the nose. When one gently pulls down the lower lid, there is visible at the conjunctival margin of the lid near the inner angle the opening to the canaliculi which leads to the sac. The tears or secretion drain into this system by suction, and except when in excess from crying the tears should not roll over the cheeks. There should be no swelling, purulent secretion, or other signs of inflammation of any of these parts.

Both eyes should have their axes parallel and strabismus or squint is the condition present when the visual axes of the two eyes are not directed simultaneously on the same object. This defect may be sufficient to cause double vision.

The eye directed toward the object is known as the "fixing eye," and the one deviating from the object the "squinting eye."

Involuntary contractions of eyelids to reduce the amount of light entering the eye is known as "blepharospasm," and may be due to a foreign body on the cornea or conjunctiva, disease of cornea or conjunctivitis, ingrowing or misplaced eyelashes, refractive errors, and occasionally disease of the nervous system.

Involuntary lateral movements of the eyeballs (nystagmus) may be caused by a disease of the central nervous system. This is sometimes seen in mental defectives.

The existence of any of the diseases described above can be detected by a trained physician in a few moments' inspection with the light from a window. The patient faces the light and the examiner has his back to the window. After a careful visual inspection, the lower lid is pulled down, using the index finger of the right hand, and the child requested to look up toward the ceiling, which procedure gives a good view of the conjunctiva of the lower lid. Any undue redness or follicular condition on the conjunctiva should be noted, likewise, the presence of purulent secretion from the lacrimal duct.

To inspect the conjunctival surface of the upper lid, it should be everted. To do this the examiner stands in front of the child, takes hold of the margin of the lid and lashes with the thumb and index finger of the left hand, and with a toothpick, match stick or probe in the right hand held against the lid and about parallel to its margin pulls the lid with the left hand away from the ball and quickly rolls it over the probe. The child is asked to look down toward the floor, and the probe is removed. This will be found a very simple procedure after a little practice. It is painless, harmless, and the only way to observe the condition of the conjunctiva of the upper lid. Trachoma can be readily seen if present. When the examination is finished, gently pull the lid down and request the patient to look up to the ceiling.

Conjunctivitis.—Conjunctivitis is an inflammation of the mucous membrane lining the inner aspects of the lids and the anterior surface of the eyeball. This mucous membrane is continuous with the membrane lining the nose and mouth, and is sympathetically affected by diseases of these cavities, as in coryza. A conjunctivitis is distinguished from an inflammation of the deeper tissues by the bright red vessels of the conjunctiva being easily traced. In inflammation of the deeper tissues there is a bluish- or violet-red diffuse injection, and the individual vessels do not show distinctly. When making a diagnosis it should be remembered that combinations of these affections often exist.

It is unnecessary for the inspector to intimately acquaint himself with the varieties of conjunctivitis, their pathology and bacteriology.

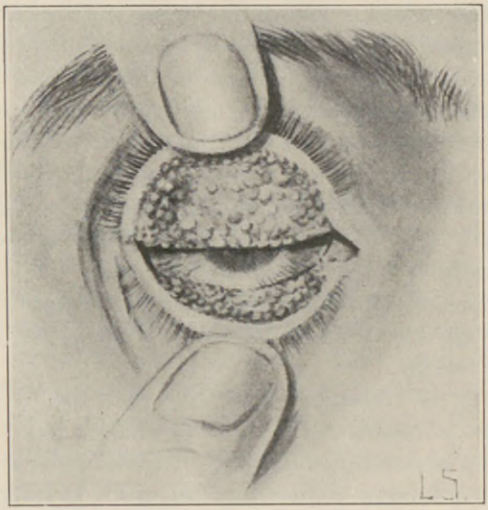
It is well to remember that the presence of a foreign body, often a mere speck of dust or cinder, may be responsible for an active inflammation. Unless one is accustomed to removing foreign bodies from the eye it is safer to resort to flushing the eye with a solution of boric acid. Grave damage has often been done by inexperienced people fishing and probing in the eye for foreign bodies.

Where an inflammation is due to irritation from a misplaced or ingrown eyelash, the offending lash can readily be pulled out with flat tweezers.

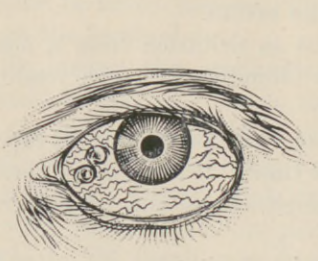
Corneal ulcers may be associated with conjunctivitis especially if it has existed for some time. If overlooked these ulcers may lead to serious complications and permanent impairment of vision.

All cases of conjunctivitis associated with a muco-purulent discharge should be considered contagious and excluded until under treatment and the discharge arrested. The inspector should not accept the statement of a child that it is receiving treatment, as it may mean the use of home remedies or treatment by a druggist. The child should be required to furnish a certificate from the attending physician.

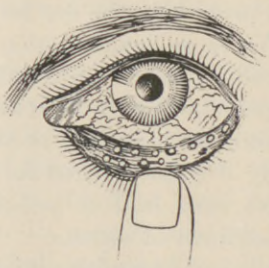
Where there are repeated attacks of conjunctivitis without an apparent cause, and even though the child shows



a



b



c

FIG. 49.—*a*, trachoma; *b*, phlyctenular conjunctivitis; *c*, follicular conjunctivitis.

full vision by test cards, the inspector should insist upon an examination under a mydriatic. These cases often prove to be highly hyperopic.

The school physician should acquaint himself with the appearance of three inflammatory diseases of the conjunctiva which occur more or less frequently among school children: (1) Phlyctenular conjunctivitis; (2) follicular conjunctivitis; (3) trachoma.

Phlyctenular conjunctivitis is characterized by blebs or vesicles in conjunction with an inflammation of the bulbar conjunctiva. There is redness, irritation, inability to stand light, and a muco-purulent discharge. This form of disease is common among children who are poorly nourished and live under insanitary conditions. Tonics and fresh air are needed as part of the treatment.

Follicular conjunctivitis is of importance because of its resemblance to trachoma. As the term implies, it is accompanied by the formation of follicles or nodules on the conjunctiva. These nodules are regular in size and appear in rows of small white nodules covered with the glistening conjunctiva. It is seen in both upper and lower lids. This disease responds readily to treatment, while trachoma is more chronic and resistant.

Trachoma.—Trachoma is a contagious disease of the conjunctiva associated with a formation of follicles and enlargement of the papilla, giving a granulated mass sometimes characteristic in appearance. The condition is best recognized deep in the upper retro-tarsal fold by everting the upper lid as far as possible. The condition often appeared to the author as though a layer of finely chopped raw beef had been spread upon the conjunctiva.

Reports from most cities show the diagnosis of trachoma to be a difficult problem. Follicular conjunctivitis is most often mistaken for the disease. The inspector need not be discouraged at such mistakes, for even experts on the subject are often in doubt and refuse to make a positive diagnosis except after two or three weeks' treatment. If the case at such time does not clear up, it is supposed to be trachoma. Of course, a bacteriological examination of the trachoma

bodies can be made, but few physicians have such laboratory facilities. One may read any number of good descriptions of trachoma and yet fail to recognize a case. Only the practical experience derived from personal observation of a number of cases in the various stages can be of true value to the diagnostician. Pulling down the lower lid and noting a few enlarged follicles is deceiving, because trachoma, as generally found in our public schools, the trachoma bodies are found well up under the upper lid and can be seen only

FIG. 50.—Inspection of eye for trachoma.

by inverting the lid with a probe or toothpick. The disease may be in an acute stage, with some secretion, or it may be chronic, with cicatricial tissue. The cornea must be examined for any consequent damage to this tissue. All cases of trachoma in an acute or subacute stage with any secretion must be excluded from school, but when there is merely evidence of the remains of the disease, as cicatrization, this is not necessary.

When one stops to consider that trachoma, which is more

prevalent in foreign countries, is brought to America by the immigrant, and that the Government holds a strict supervision and examination of all persons admitted to the United States, deporting every case with the slightest suspicions of the disease—one can readily understand why we should not find many cases even in our large seaport towns. The trachoma generally found here are cases which have become quiescent, and after the child has been in the United States for a time, there is an exacerbation, with return of symptoms.

FIG. 51.—Cases of squint or strabismus.

Squint or Strabismus.—The subject of strabismus or squint among school children is of sufficient importance to warrant a small volume on the subject. The physician should know that most of the cases of strabismus are due to ametropia and an early correction by properly adjusted glasses, steadily worn, may mean the straightening of the axes of the eyes. It is in the primary grades where cases of squint should be recognized and treatment urged.

Diseases of the lacrimal glands and passages, the iris and ciliary body, lens and cornea need no absolute diagnosis

from the school doctor further than recognition of the existence of some disease of these parts and the recommendation of treatment. Diseases of choroid and retina can only be diagnosticated by using the ophthalmoscope under proper lighting, and belong within the sphere of the oculist.

Defective Vision.—No physical defect is of more importance with regard to the development of the child and the progress of its education than defective vision. It is one of the most frequent major defects noted in inspections of school children. Defective vision is a logical sequence of hereditary or congenital conditions and may be materially increased by illness or lack of care and hygiene in the use of the eyes. Its beginnings are primarily congenital and abuse and continued strain necessarily increases the pathological condition. The tissues in childhood are plastic and reading or writing under unfavorable conditions further moulds the defect.

The assertion that most children enter school life with perfect eyes and the bad lighting, seating and other faults in schools cause the defects of vision is erroneous. The child has the defect when it begins school life and the conditions make the diagnosis more apparent by symptoms though it may increase the amount of error.

It is undisputed that ideal working conditions at school and home and observing simple rules of eye hygiene is most important in conserving the vision we have. That all authorities recognize the extreme importance of protecting the eye is shown in the great number of States which have enacted laws requiring the examination of the eyes of its school population. The duty is assigned to teacher, doctor or nurse.

Various statistics have been published to show a greater frequency of defective vision among rural children. No real purpose is served and the comparisons are erroneous. Ascribing poor lighting and sanitation of rural schools as the probable cause does not hold. City children have the advantage of ample and better medical facilities.

The proportion of children who have defective vision cannot be properly estimated from the annual reports rendered as the inspectors do not record those children wearing correcting glasses and where intensive work has been done in having recommendations acted upon, the true number of pupils with normal eyes is overestimated.

The percentage of eye defects reported in various cities as well as by different inspectors in the same city varies from 1 to 50 per cent of the pupils examined. This is due to a lack of uniformity in method of examining, lighting of test cards, training and skill of the examiner and up to what degree of variation one terms normal. In cities where school inspections have existed for a number of years, 12 per cent of those examined would be a fair average of the number of defective vision cases found.

The data on the results of vision tests are extremely variable, due to the varying ability of the examiners and the lack of uniformity in the methods employed. The reports from various cities show the number of children with defective vision to be from 10 per cent to 90 per cent of those examined. In a dozen different schools in Boston, examination of the pupils of the five upper grammar grades by the different inspectors gave the number of cases of defective vision varying from 8 to 50 per cent. In the towns and cities of Massachusetts the variation for different schools was 5 to 35 per cent.

In New York City in 1922, 33,400, or 11 per cent of the children examined, were found to have defective vision. In Chicago there were found 18,086 or 14 per cent and in Philadelphia 21,500 or 9.3 per cent.

Great difference in percentages of defective vision are due to a variability of what constitutes "defective" and the methods of examination. If testing visual acuity by means of test cards gave an accurate and reliable result showing the exact condition of the eyes, any teacher or even an older pupil could satisfactorily perform the examination. The

author does not agree with many of the writers on this subject that the testing of vision can be performed by teachers and others, for reasons which will be explained later.

In at least twenty-eight States there exist acts of legislatures which requires the testing of vision of the school pupils. In most of them the examinations are mandatory but the person to whom the duty is assigned is variable, and in two-thirds of the States the teacher is specified. Once a year is the general statement of the frequency of examination.

Many cases of defective vision in children can be diagnosticated only when a mydriatic is used and by examinations made with instruments of precision, such as the retinoscope and the ophthalmoscope under proper lighting. These cases belong to the oculist, as the schools offer no such facilities. It is important to avail one's self of expert knowledge on diseases of the eyes, as defective vision has a most direct and important bearing on the mentally defective and subnormal child. The consideration of the subject from such a standpoint will be taken up in the chapter on subnormal pupils.

There have been many reports from various cities classifying the number of cases of hyperopia, myopia, and astigmatism diagnosticated by the school inspectors using test cards. Physicians and laymen speak frequently of the near-sighted pupil. These classifications and expressions are often erroneous, and, to say the least, misleading, because it is almost impossible for a physician to diagnosticate the kind of ametropia except when the child is under a mydriatic and the physician uses instruments of precision, such as retinoscope and ophthalmoscope. Statistics show that the near-sighted child is in the minority, averaging less than 20 per cent of the defects diagnosticated.

A knowledge of the physiology of the eye and the power of accommodation explains the reasons for the deception in diagnosis by the use of test cards alone. Many children

who can readily read the required distance on a test card may prove under a mydriatic, which paralyzes the accommodation, to be an extreme case of defective vision. Under skilled examinations, the hyperopes vary from 75 per cent to 85 per cent of the defects found.

In Philadelphia, from 1908 to 1921, inclusive, Dr. Wessels, the ophthalmologist, diagnosticated in 35,969 children refracted under a mydriatic, 75 per cent hyperopic, 12 per cent myopic, 8 per cent mixed astigmatism, and 5 per cent amisometropia.

In 1922, Chicago had the services of two ophthalmologists paid by the Illinois Society for the Prevention of Blindness. They examined 680 children, of whom 345 were found normal; 297 had visual defects of which 175 were hyperopic, 75 myopic and 147 astigmatic; 140 had various inflammatory conditions or results. Ten pupils were recommended for sight-saving classes.

In 1922, New York maintained in connection with school inspection 10 eye clinics in charge of 10 oculists and a supervising oculist; 25,000 children were examined; 85,000 treatments given; 10,000 examinations to candidates for sight-conservation classes; 36,000 refractions; 11,000 prescriptions for glasses.

Test Cards.—The author does not mean to infer that test cards are worthless, as they are the only instruments at our command for use in the school-room, but that they should not be used for a final diagnosis. The fact that a child can see the 5-meter line at a distance of 5 meters, signifies two things, either that the child may have normal vision or may be hyperopic. If this child shows any symptoms of asthenopia, especially repeated attacks of headaches, an examination under a mydriatic should be advised. If the child before a test card does not get five-fifths vision, it may mean defective vision, which may be hyperopia, myopia, astigmatism, or any of the combinations. The use of the clock dial may assist in diagnosticating astigmatism.

The test cards enable the laymen and physicians to pick out the glaring cases of defective vision, but there is no better means of detecting such cases among school children than the observing and interested teacher, who can tell more by continuous contact and watching the actions of the children than one who stands a child for a few minutes near a test card. A child at this moment may have acute vision, but at the same time while at work in the class-room may show the effects of eye-strain.

Test cards are of various designs. The one most frequently used is that designed by Snellen, consisting of letters or figures accurately measured in dimensions for normal vision at varying distances. Some children, including foreigners who have not learned the alphabet, must be examined by using "illiterate" test cards.

The illiterate card most frequently used for testing the acuity of vision, consists of the letter E with the open spaces and arms pointing in various directions. The dimensions of the figures correspond with the sizes of the letters on a Snellen test card.

The author has devised two test cards which have been successfully used for the very young, the illiterate, and the foreign child, who have not learned the English letters or numbers. One of these cards consists of pictures and silhouettes of well-known objects, and the other of hands with a varying number of fingers extended in various directions. In both cards the figures are scientifically measured in size, and conform to the scale adopted by Snellen. The card of pictures is especially valuable for children in the lower grades. The hands are particularly adapted for foreign children who do not know the English letters or numbers and cannot tell the English word for a picture or object. With this card the child imitates with his hands what he observes on the card. These pictures of hands also take the place of the astigmatic chart, as in some cases of astigmatism, the number of fingers in a certain direction are frequently mistaken.

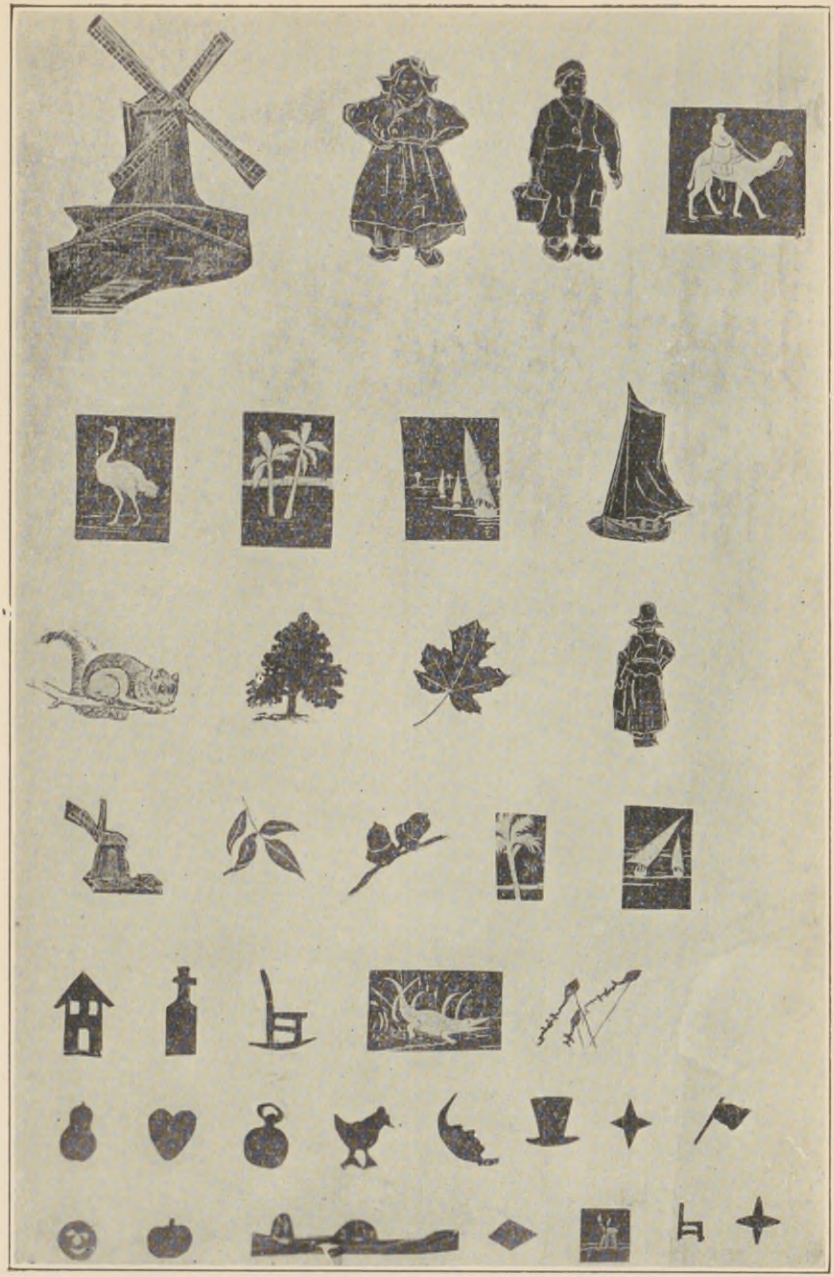


Fig. 52.

Use of Test Cards.—The test cards should be placed where they have proper illumination. Daylight from a nearby window or skylight may be used, but artificial light properly reflected on the cards is preferable. Artificial light should be shielded from the eyes of the child by use of a shade or reflector, and the angle of reflection should be such as to avoid a glare on the surface of the cardboard. The height of the card should be such that the center is on a line with the head of the child under examination.

FIG. 53.—Author's test card for illiterates and foreigners with no knowledge of English.

It is better not to expose to view more than one card at a time, as it confuses the patient. If several different types of cards are used they can be frequently changed, thus preventing the memorizing of letters or figures. This is important when the examinations must be made in the class-room, as many of the pupils awaiting examination have an opportunity to study a card and memorize the letters. Another way of preventing this, is to require the child to read the letters from right to left.

The child should be seated at a distance of 16 to 20 feet from the card, and each eye should be tested separately

by covering the other with a piece of cardboard. The child reads the letters aloud, beginning with the top line, which is in largest type. In recording the results of the test, the distance between the card and the child becomes the numerator of the fraction measuring the visual acuity and the smallest type correctly read according to the distance which it should normally have been seen becomes the denominator. These distances are marked after each line on the test card. If a child seated 20 feet from a card correctly reads the letters on the line marked 30 feet, and can read no farther, the visual acuity for the eye under examination is $\frac{20}{30}$. The right eye is generally tested first.

If some of the letters on a line are misquoted, the sign (—) is placed after the fraction ($\frac{20}{30}$—), meaning less than $\frac{20}{30}$ vision.

It is a safe rule never to examine a child who is not under a mydriatic in the presence of its parents. If the child reads the small type, which is often the case in hyperopes, the physician will have great difficulty in convincing the parents that the child has defective vision.

The test with the astigmatic chart or clock dial is made in the same way as with other charts, except that this time the child is requested to tell which lines look the blackest and clearest If all lines look alike one may infer that no astigmatism exists, but where a particular axis is mentioned it suggests error of refraction in the opposite axis.

The test cards are valuable in some cases as a subjective test, but they make it possible to recognize only the glaring cases of defective vision or those cases in which there is not sufficient accommodation to overcome the defect in visual acuity. The test card does not permit of an accurate classification between hyperopes (far-sighted), myopes (near-sighted) and astigmatism. It is sufficient for the examiner to recognize that a defect exists and leave the diagnosis of variety to the experienced physician or oculist.

Abuse of Test Cards.—The dangers of relying upon test cards for diagnosis is shown in the following incident:

Recently, a principal of a public school published the results of an examination of about 500 children, using the A B C letter test card and the illiterate E card, and compared the results. His method consisted of placing the child 16 feet from the card; if he saw correctly the letters of the 16 feet line, he was asked to step back 2 feet, and if he still read the letters correctly, he was designated as far-sighted. If he could not see distinctly every letter at 16 feet, he was advanced 2 feet at a time until he accomplished the reading, and these cases were all labeled as myopic or near-sighted. His results recorded were as follows: With A B C card: Near-sighted, 65.8 per cent; far-sighted, 15.5 per cent. With the illiterate E card he found: Near-sighted, 8.1 per cent; far-sighted, 82.2 per cent. Having obtained these directly opposite results, he very ingeniously formulated a theory to prove the illiterate E test card built wrong. It happens, however, that the results he obtained with the illiterate card are nearer to being correct. Myopia in children is rare in comparison to hypermetropia, even if one does hear more about "the near-sighted child." The principal comments as follows: "I frequently found it necessary in all grades, especially in the primary grades, to allow the pupils to rest their eyes. . . Many eyes after reading a half dozen letters were filled with tears. . . It was not an uncommon thing for a pupil to have to move up to 12 feet in order to make out the direction of the E; but having once clearly seen it he could recognize the other directions with apparent ease at twice the distance." There is no desire to ridicule the work of this gentleman, but rather congratulate him on his honesty in publishing such a full and concise report after obtaining such extremely opposite results. His comments spell most plainly *accommodation*. This principal is not the only one who has made the error of trying to tabulate the near- and far-sighted by

means of the test cards. The author recently read the report of a physician who examined 1000 school children and used the following method: The pupil was placed 5 meters from a test card, and a convex spherical lens of a ½ diopter was placed in front of the eye; if the child said he saw better with this lens than with the naked eye he was registered as hypermetropic. If he could see better with a concave spherical lens of a ½ diopter he was considered near-sighted, and all others were normal. These statistics are worthless, as a child may easily overcome even a much stronger lens and see distinctly.

Symptoms of Defective Vision.—There are two available methods for the school examiner in recognizing defective vision. (1) Use of test cards; (2) signs and symptoms of eye-strain. The author considers the latter the more reliable method for an examiner not trained in the use of instruments of precision.

These symptoms may be briefly described as impaired visual acuity, or the power to view objects distinctly at a distance, with complaint on the part of the child; redness or inflammation of the conjunctiva of the lids or eyeballs; repeated existence of styes; squinting of eyes and wrinkling of forehead; headaches on forehead, temples or base of head; nausea, especially when riding in cars; twitching of muscles of forehead or face resembling chorea; holding books nearer or farther from eyes than normal; presence of squint or cross-eyes; various nervous symptoms, even resembling epilepsy in some cases. One or more of these symptoms may be present or obtained from a history of the case. Occasionally no symptom may be complained of, but the child may lack the power of concentration or be deficient in certain branches of study, such as reading or writing. Whenever any signs or symptoms of eye-strain are present, even though the child shows normal vision with test cards, the inspector should insist on an examination under mydriatic (eye drops) by a competent physician or oculist.

The Need of a Mydriatic.—There are two kinds of errors of refraction: (1) Manifest; (2) latent. The eyes have a power of accommodation, or overcoming errors, most marked among children. This is accomplished by changing the curvature of the cornea and possibly the lens, thus making the rays of light come to a focus on a short or long eye. The errors which persist in spite of this power of accommodation are called "manifest," while those which are overcome by it are called "latent." A mydriatic is a drug which when instilled into the eye prevents the power of accommodation and thus all the error becomes manifest. It is then possible to diagnosticate the true condition of the eyes and those which before gave full vision may now show half or even less of normal vision.

The belief that the use of drops for such purpose is harmful is erroneous, but because of this belief the physician should always explain to a mother, who entertains such fears, the reason for their use.

The question is frequently asked," How old should a child be to admit of an examination of the eyes?" Any age after four or five years if the child shows marked symptoms of defective vision.

Strabismus or squint is generally due to defective vision, and the results, especially to straightening the eyes, are more marked if the child is examined while young and necessary correcting glasses prescribed. If the squinting eye is long out of use, it may become a blind eye insofar as vision is concerned.

Children who have been wearing glasses should be watched, and if they come to school without them, should be sent home for them. If the child persists in not wearing the glasses, possibly the glasses are not suited, or the frames are so ill-fitting as to give discomfort. Again, it seems criminal to allow a child to sit in the class-room wearing a pair of glasses so out of adjustment that one lens is on the forehead and the other upon the cheek. An example of such a case is shown in Fig. 54.

When a physician writes a prescription for glasses, and the lenses are supposed to contain cylinders at a certain axis, to correct astigmatism, what results can be expected from the glasses if the patient wears the lenses at any axis? The patient has poor results and the physician receives the blame. Again, the proper fitting of the frames is as necessary as the proper lenses. Unless otherwise ordered for a certain effect, lenses should be so adjusted that the center

FIG. 54.—Glasses need adjusting, a condition to receive attention from teacher.

of the lens is at the center of the pupil. A little attention by teachers to children wearing glasses would result in giving considerable comfort. Frequently a patient returns after a year or so and asks whether they need to change their glasses, because they cannot see as clearly as they did at first, and on adjusting the lenses the fault is easily remedied.

Many parents pay little attention to their children who have squint, because they believe it to be a congenital condition for which little can be done. It may be well to

impress on such parents that a congenital squint is rare. It frequently happens, however, that a child inherits defective vision, and through this defect the squint is manifested. When a squint is congenital, there is frequently an accompanying asymmetry of the orbits and possibly of the skull. It is stated by some that the asymmetry of the orbit admits of the eye turning to adjust itself to the shape of the orbit.

Teachers should aid the physicians in overcoming the opinion that "children should not wear glasses because in that event they must wear them forever."

Hygiene of the Eyes.—School hygiene, with an object of conservation of the eyes of the pupils, should be constantly taught and practised. Children should learn the dangers, the causes and effects of eye-strain. They should be impressed with the necessity of good useful vision in all future endeavors of life.

Environment has a marked influence on the health of the eyes and visual acuity. Acute diseases are perhaps the most important factors which may later impair vision. Measles, scarlet fever and whooping-cough are the common diseases having associated inflammation of the eyes and which may, if extreme care is not taken, leave irreparable damage to eyesight. Inflamed eyes must not be passed off as merely a cold in the eyes. Poor nutrition often affects vision and the cause must be treated.

Environment affecting vision is: (1) Within the school; (2) without, at home and elsewhere. Those things within the school include the kind of natural and artificial lighting, color and glare of surrounding walls, boards, etc.; seating in relation to light; unsuited desks and chairs; size of writing on the boards, style of type and kind of paper in the text-books used; class-room procedure or routine which causes visual fatigue; rest periods for eyes; kind and condition of window shades.

Lighting in class-rooms and at home has not received the

consideration it deserves from architects, teachers, parents or school hygienists. Plans of school buildings should be critically studied by those with a knowledge of teaching in class-rooms, before approval by educational authorities. Many architects are unfortunately unacquainted with these needs in a modern school.

Glare from blackboards, varnished walls, polished desks, direct sunlight, glossy paper, glass over pictures are some sources of danger to eyes. Locations of windows as well as the size and their relation to seating is of prime importance.

Interior Colors.—Clean walls with light colored paint, free from gloss, is an important factor in lighting scheme. Grays, greens and tans are the preferred colors. Varying shades of the same color should be utilized, the darker shade nearer the floor and a cream tint used for ceilings.

Window Shades.—The choice of color of shades, the quality of material and the maintenance should receive consideration. A light buff or tan is acceptable. Adjustable fixtures should permit drawing the shade over the area needed to protect against sunlight or glare.

Blackboards are a necessary evil in the class-room, but no substitute has been found. Most class-rooms have too many blackboards and many badly placed. Under, across or between windows should be forbidden. Deterioration is frequent and seldom corrected. The height of a board should vary with the size of the pupils, from $2\frac{1}{2}$ to 5 feet from floor.

Adjustment of desks and seating should afford comfort in close work. Children who have defective vision should be placed closer to the boards. Light should enter from the left or if necessary also from the rear of the pupils. This question is further discussed under "Desks and Seating."

School text-books, their grade of paper, luster, size of print and cleanliness is too frequently ignored. A survey of any school will afford positive proof of this neglect to the detriment of the eyes of the pupils.

Handbooks and circulars of instruction furnished to the children are splendid additions to an educational campaign.

There should be formulated school-book standards which should be supplied to all educational authorities and school-book publishers. There should be typographical standards with minimum requirements for size of letters, spacing, kind of type and other technical details.

The British Association for the Advancement of Science has formulated the typographical standards shown in Table XXII. The author believes there is no necessity of decreasing the size of type with each year, but to use large type below second grade, somewhat smaller in grades up to grammar; and a clear regulation bold type for all other printed matter for schools.

TABLE XXII.—STANDARD TYPOGRAPHICAL TABLE.[1]

(1 inch = 25.4 mm.)

Age of reader.	Minimum height of face of short letters.	Minimum length of alphabet of small letters.	Minimum interlinear space.	Maximum number of lines per vertical 100 mm. or 4 inches.	Maximum length or measure of line.
	Mm.	*Mm.*	*Mm.*		*Mm.*
Under 7 years	3.5	96	6.5	10	
7 to 8 "	2.5	72	4.0	15	100 or 4 in.
8 to 9 "	2.0	55	2.9	20	93 or $3\frac{3}{4}$ in.
9 to 12 "	1.8	50	2.4	22	93 or $3\frac{3}{4}$ in.
Over 12 "	1.58 or $\frac{1}{16}$ in.	47	2.2	24	93 or $3\frac{3}{4}$ in.

The following recommendations were worked out by the committee of the American School Hygiene Association, following the ideas of eminent American and European writers. Their recommendations are:

1. The instruction should be divided so that the eyes are not used for near work too long continuously: (*a*) Diminution of power of focusing for small objects increases rapidly the longer the eyes are used; (*b*) in the first year the time

[1] From the Report on Influence of Schoolbooks upon Eyesight, by the British Association for the Advancement of Science, 1913.

should not be longer than fifteen minutes, increasing to one hour in later adolescent years.

2. There should be a frequent change of tension by looking at distant objects.

3. There should be frequent recesses in the lower grades, to relieve the general nervous tension.

4. Proper position should be insisted upon reading, writing, drawing, etc: (*a*) The head should be erect, and if bending forward is necessary, it should be from the trunk; (*b*) in reading, the book should be held at a distance of at least 12 inches as nearly as possible.

5. The handwriting should be large. The small letters should not be less than 5 mm. high for beginners, and 2.5 mm. in adolescent years.

6. There should be a preponderance of oral and blackboard instruction in the early years.

7. The home work should be very limited.

A tentative syllabus of hygiene in use in the public elementary schools of New York City aims "to counteract and eliminate the health depressing influences of school life." The instruction seeks not alone to inculcate health habits in the children but also to cultivate class-room health practices in teachers. The hygiene of the eye and eyesight conservation are covered by the following passages:

Grade 1B.—Seventh and eighth week: Eyes; care of eyes; cleanliness and infection; bathing corners every morning; danger of dirty towels and wash rags. Individual towels. Sore eyes and lids; avoid rubbing; use of separate handkerchief or cloth for infected eye; avoid danger of infecting healthy eye. Secure attention.

Grade 4B.—Fifth and sixth week: Care of the eyes. Bathing corners every morning. Protection from infection. Danger of dirty towels and wash rags and handkerchiefs. The individual towl. Danger of rubbing eyes. Removal of foreign bodies from eyes. Use of boracic acid solution. Care of sore eyes and lids. Use of separate handkerchief

or cloth for infected eye. Protection of healthy eye. Need of expert attention. Poor sight, eye strain and headaches. Necessity of examination and glasses. How to study. Proper lighting for reading, working.

Grade 7A.—Seventh and eighth week: The eye; the function of eyelids, lashes, and tears. The importance of sight and methods of safeguarding it; the necessity of eye-glasses for defective vision. Color blindness and its importance in certain types of occupation.

The Hygiene of the Class-room.—1. *Seating:* The teacher should seat the pupils at the beginning of the term with regard to the following points:

(*a*) Height: Not later than two weeks after the beginning of the term seats should be adjusted by the janitor so that the pupil can sit with hips well back, the thighs resting on the seat and the feet flat upon the floor. The desk and seat should be adjusted so that the proper writing position can be taken, *i. e.*, hips back, body straight, inclined forward (never flexed or twisted), forearms resting on the desk near the edge. The eyes should not then be nearer than 10 inches nor more than 16 inches from the writing.

(*b*) Defects in vision and hearing: These defects should be discovered early so that afflicted children may be placed at a proper distance from the blackboard and teacher's desk. To this end they may consult the reverse side of the pupils' class record card.

2. *Light:* Light should fall from the left and from behind. Shades should be so adjusted that the sunshine shall not fall upon the book or work. There should not be two consecutive periods of close eye work. The eyes should never be closer than 10 inches to the work, 14 inches is preferable, and should be raised occasionally from the work. Books should be held at a right angle to the line of vision, and off the desk though the hands may rest upon it.

In connection with class-room hygiene a special effort has

been made in New York City to secure the most favorable hygienic conditions possible for the protection of children's eyesight in poorly lighted class-rooms. A set of instructions to teachers, prepared in coöperation by the director of physical training (having charge of educational hygiene) and the superintendent of school buildings and approved by the board of superintendents, has been issued in the following form:

1. Artificial illumination should be used whenever necessary. No rule can be laid down to guide the teacher in this matter. She must use her own discretion and judge when artificial light is necessary. It must be used at once if pupils exhibit any difficulty in reading.

2. Teachers should be alert to report to the principal if the windows, walls, or prismatic glass reflectors are not clean.

3. Dark colored pictures should not be hung on the walls and dark colored charts should be displayed only when necessary, for these diminish the light in the class-room.

4. Teachers should refrain from placing curtains, or any other obstruction in the window.

5. Window shades should be kept rolled up as much as possible. Attention should be paid to the proper regulations of the shades, protecting the children's eyes from insufficient or excessive light.

6. To favor the maintenace of the proper reading and working distance, pupils should be seated, insofar as possible, at desks according to their size. Janitors are required to make adjustment of furniture upon instruction from the principal. Children having defective vision should be seated as near as possible to the front of the room.

7. The eyes should be raised occasionally from the work, and there should not be two consecutive periods of close eye work.

THE EARS.

Method of Inspection.—The school medical inspector, not having the equipment nor the proper reflected light needed for a thorough examination of the organs of hearing, may confine his examination to the recognition of defective hearing, and presence of discharges from the ears. The cause and technical diagnosis can be left to the family physician or the specialist.

An inspection should be made in a good light before a window. The following conditions are looked for, the presence of any unusual redness or swelling of the external ear or the surrounding tissue; any purulent discharge from the meatus; or wax and other foreign bodies closing the canal. After observation for any of the above diseases, each ear is tested separately for acuity of hearing.

Method of Testing Hearing.—The hearing may be scientifically tested with an "audiometer," but this instrument has no distinct advantage over the watch or whispered voice. For school examinations the watch or whispered voice is usually employed, while the scientific instruments are used in clinics and laboratories.

Watch Test.—This test is conducted as follows: The examiner stands in front of the child and requests him to close the left ear tightly with his left hand, and also to close his eyes. A watch is then held about 2 feet from and on a line with the right ear. The child is asked if he hears the tick of the watch, and if he answers in the negative the watch is brought slowly closer to the ear until the child claims he hears it. Normally, a watch tick should be heard at 1½ to 2 feet. Results are then recorded—"Right ear, normal" or "Watch at 6 inches," etc. If the watch cannot be heard close to the ear, it should be placed against the mastoid bone behind the ear. If the tick is heard there and not in front, it signifies trouble with the conducting apparatus.

The left ear is tested in a similar manner, with the right

ear closed. The examiner should be sure that the watch is in running order before recording results. The closing of the eyes is to prevent guessing, which can be detected by occasionally removing the watch and see if the child still claims to hear the tick. If under these conditions an affirmative answer is given, it is best to resort to the whispered voice test.

FIG. 55.—Testing hearing with a watch.

Often suspicious cases of defective hearing can be detected as the child enters the room for examination. One simple method, but a good preliminary test, while the child is about 10 feet distant, is to ask in a low tone, "What is your name?" "How old are you?" or similar questions. Where defective hearing exists, and the child has been watching, he either notes the movements of the lips, or hears some sounds imperfectly, and the natural answer is, "What?" "Sir," etc. Suspicious cases should always be confirmed by further examination.

Whispered Voice Test.—The child is placed in a corner of the room away from an open door or window, with his back toward the examiner to prevent his watching the movements of the lips. It is surprising how often a partly deaf child

trains itself to interpret what one is saying by watching the lip movements. The child is instructed to repeat every word he hears, and is then requested to close the left ear, tightly with the left hand. The examiner, 20 feet distant, in a clear, distinct, low tone, pronounces words for the child to repeat. If properly interpreted, the ear is recorded "normal." If not heard, the examiner walks toward the child speaking as before until he comes near enough to be distinctly heard. The hearing for the ear under examination is recorded, "whispered voice, 5 feet," or whatever the distance may be. The left ear is similarly tested. The whispered voice is the most reliable and practical test for school children.

Diseases of the Ear.— Impacted cerumen or wax is recognized in most cases by a casual inspection. This is often a sign of more serious trouble with the ear and should not be passed by as unimportant. These cases should always be referred to a physician or dispensary.

Earache, when complained of by a child, should not be slighted, and as a precaution in home treatment, parents should be discouraged from pouring various hot fluids into an ear without consulting a physician. It is also advisable to warn parents and teachers of the dangers attending slapping the ears of children.

A purulent or muco-purulent discharge from an ear should always be looked upon with suspicion, especially if a child has recently been absent for a week or so. Close questioning may reveal a recent case of scarlet fever, diphtheria, or other infectious disease. It is well when possible to make cultures of such discharges to enable a laboratory diagnosis.

Even should a discharge from an ear prove to be benign, treatment should be insisted upon, as the odor is obnoxious to the classmates and the dangers to the child are numerous.

Defects of hearing and diseases of the ear should require a careful inspection of the nose and throat for causative factors, as there is an intimate relation between these cavities.

NOSE AND THROAT.

The nose and throat are important cavities, requiring careful inspection by the school medical examiner. They may show the first signs and symptoms of an acute infectious disease or they may contain defects which greatly hinder the development of a child. These cavities play an important role in breathing and in the faculty of speech. There is not available at the schools proper lighting or instruments for an exhaustive study of these cavities, and because of the hidden location of certain defects, it is impossible to see and accurately diagnosticate them without the needed equipment; nevertheless, careful inspection may aid in detecting some of the common defects and diseases. This is generally so with adenoids, enlarged or diseased turbinates, deflected septum, and growths. The teacher, nurse, and physician may note occlusion of one or both nostrils and mouth breathing, and infer that the child has adenoids. It is better to record "nasal obstruction" and leave the diagnosis of causative factor, whether adenoids, nasal catarrh, deflected septum, or lack of toilet of the nostrils to the attending physician or specialist. Several years ago the author sent 50 pupils who were diagnosticated by teachers and nurses as cases of adenoids, to a nose and throat specialist for reports on diagnosis. Only 9 were found to have adenoids, while over one-half had nasal obstruction and mouth breathing from a lack of cleanliness of the nostrils.

A muco-purulent discharge from the nostrils accompanied by watering of the eyes may indicate measles. If a child has been absent for several days and returns with a nasal discharge, eliminate diphtheria and scarlet fever. Coryza, bronchitis, and hay fever have nasal discharge as a prominent symptom. If a child has a chronic, fetid discharge an atrophic rhinitis may exist, possibly accompanied by a growth.

Foreign bodies, pencils, rubbers, and various other small

articles are occasionally pushed into the nostrils. These can frequently be extracted with small tweezers. In the absence of tweezers, a hair-pin, with its ends bent to make a broader grasping surface, may answer the purpose.

Nose-bleed is frequent in children, due to injury, catarrhal conditions, plethora, and more rarely cardiac or pulmonary affections. It may be controlled by applying ice to the base of the nose or nape of the neck, with the child in the recumbent position. A weak solution of tannic acid on a pledget of gauze inserted into the nostrils or an application of adrenalin solution may be required.

Technic of Examination.—To examine the mouth, teeth, palate, tonsils, and pharynx, the child should be requested to open the mouth, but not to stick out the tongue. Then the examiner can observe the condition of teeth, tongue, and mucous membrane of that cavity. Ulcers or an inflammation (stomatitis) of the mucous membrane may be present. Foul breath may indicate carious teeth or want of cleanliness of the mouth, and a coated tongue may reflect gastro-intestinal derangement. The child should then be requested to protrude the tongue and say "Ah" (as in father). With a wooden tongue depressor on the tongue not too far back, the examiner can obtain a good view of the tonsils, uvula, and pharynx.

The shape and condition of the vault of the mouth, size of uvula, presence of cleft palate, size and condition of tonsils and pharynx, and the presence of any foreign growths, like adenoids in upper part of pharynx, all should be noted. Also any unusual redness of the tonsils or uvula, and presence of any exudate, membrane, or follicular plugs should be carefully looked for, keeping in mind the possibility of scarlet fever and diphtheria.

A suppurative tonsillitis or quinsy may push a red, swollen tonsil foward. Plugs of exudate in the follicles of the tonsils suggest a follicular tonsillitis. Deep ulcers upon the tonsils with surrounding tissue normal is suggestive of syphilis.

All membranes, exudate on tonsils, pharynx, or adjoining tissues, should be cultured for diphtheria germs.

The Voice.—The voice may often give valuable diagnostic signs. Whispered low sounds or harsh coarse voice may indicate an acute laryngitis, tonsillitis, or diphtheria. If subacute or chronic, it may be due to postdiphtheritic paralysis or habit tones. Mouth speech with absence of nasal sounds accompanied by mouth breathing indicates an obstruction in the nasopharynx or nostrils. Various defects especially if due to pathological conditions of the mouth or throat are readily diagnosed on inspection.

Enlarged Tonsils.—Excepting adenoids, no other defect is more discussed in the examination of school children than enlarged or hypertrophied tonsils. Various cities report from 5 per cent to 85 per cent of the school population as suffering from this defect. This wide variation is due to the lack of a uniform standard of what constitutes an enlarged tonsil. Enlarged tonsils should mean only those defects in which the tonsils are large enough to give signs and symptoms of obstruction to the upper air passages. One must consider the relative size of the throat in comparison to the size of the tonsils. A ragged, diseased tonsil though comparatively small is more dangerous to the health of a child than an enlarged smooth tonsil giving no symptoms. The promiscuous removal of such tonsils, which seem a trifle larger than what we think they should be, is not to be encouraged. "Hypertrophied tonsils" should only be recorded on the physical record card of a child, when such a diagnosis has been made by a physician or specialist in diseases of the nose and throat.

Adenoids.—In some cities a medical inspector who has not diagnosticated a great number of cases of adenoids among his pupils is considered negligent in his duties, while in reality he is conscientious and worthy of commendation. Mouth breathing is not always evidence of the presence of adenoids, and a mere glance in the throat rarely shows these

growths. The specialist never makes a diagnosis of this defect until he has passed a small mirror to the back of the throat and sees the growths reflected there, or has passed a finger back into the pharyngeal cavity and felt the irregular masses. Therefore, although it is well to be suspicious of adenoids, the case should not be labeled as such until the growths are seen or felt.

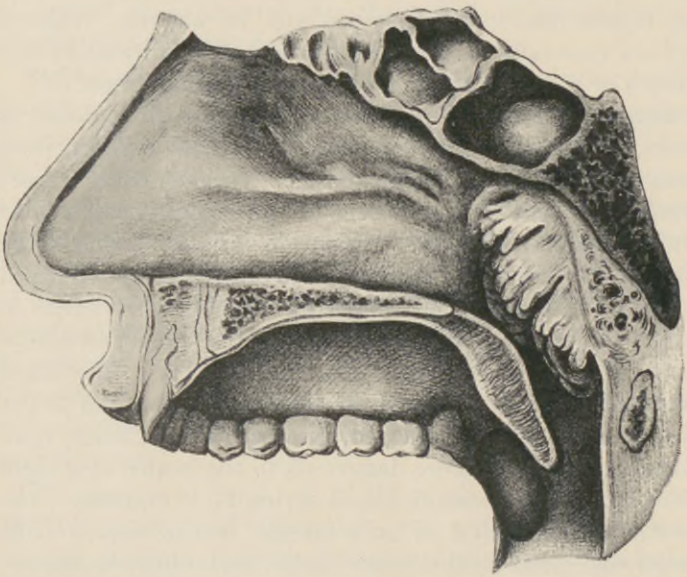


FIG. 56.—Antero-posterior section of the head, showing location of adenoids and difficulty of diagnosticating by simple inspection.

When adenoids and hypertrophied tonsils are present in a child, they may not only give acute and alarming symptoms, but may have a permanent effect on the child's health. Some of the effects produced are:

1. Danger of obstruction to breathing and improper aëration of the lungs, which may influence the health and mental development of the child.

2. Changes in expression and contour of the face.
3. Defective speech.
4. Dangers of ear complications, inflammation, otorrhea, and defective hearing.
5. Increased liability to infectious diseases, especially diphtheria and scarlet fever.
6. Frequent attacks of colds and nasal catarrh.

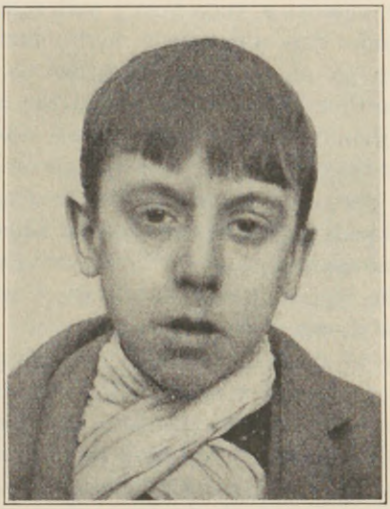


FIG. 57.—Usual expression of a boy with adenoids.

Hypertrophied tonsils and adenoids have a tendency to become smaller during early adolescence and sometimes disappear in adult life. This, however, is no argument for non-treatment of these defects as the above cited dangers are always present. In some cases the so-called disappearance of adenoids or enlarged tonsils as the child grows older is only a relative diminution in size. Here the growth remains stationary while the cavity of the pharynx and throat enlarges with the development of the child.

Speech.—Normal speech is a clear, distinct, and audible pronunciation of sounds, letters, and words. It is dependent upon the normal condition of the nerve centers, larynx, pharynx, nostrils, vault of the mouth, tongue, teeth, and lips. The sense of hearing influences the sense of speech. Abnormality of any of these organs may be expected to cause defects of speech.

A child deprived of either his sight, his hearing or his voice must struggle against a very heavy and serious handicap. No sense is more dependent upon environment as much as speech. There is unconscious imitation to influence the voice. The author has always felt that the curriculum for all children should include voice culture for speaking in preference to singing. Good articulation is acquired, and to make it a matter of chance on cultured environment is decidedly bad pedagogy. Monotone and squeaky speech is avoidable, and trained teachers in the educational system should be the responsible ones. Correct use of tongue, teeth and lips should receive attention.

The misuse of the vocal organs is responsible for more defects and pathological changes than the medical profession accredits it. Many public speakers are quickly disabled because they depend on pitch and volume to carry across what should be involuntary and effortless. Many stammerers began by speaking unchecked with confusing rapidity.

To test speech, the child should be required to pronounce certain letters, and words containing combinations of these letters. The letters most frequently mispronounced are: b, m, n, f, p, v, w, o and u; also the dentilinguals d, t, th, l, n, r and s.

The defects of speech found among school children include:

1. Aphasias.
2. Tremulous, interrupted speech.
3. Hesitating speech.
4. Inability to pronounce certain letters.
5. Stuttering, or stammering.

One or more of these defects are occasionally found among mentally defective children.

Malformations of the oral cavity are chiefly those due to irregular teeth or shallow and small arches forming the palates. In the lower grades there is occasionally found a case of cleft palate or cleft lips. Any of these malformations may seriously interfere with speech.

Defects of speech are:

1. Pathological.
2. Habit.

They may be caused by:

(*a*) Arrest of lingual development.

(*b*) Deafness from birth.

(*c*) Disinclination to talk, absence of impulse of imitation (auditory dumbness).

(*d*) Defective memory or aphasia.

(*e*) Arrest of motor development (stammering).

Spluttering or hasty talking called lingual ataxia in which syllables and words are swallowed or mutilated. There is inability to express the flight of thoughts or a disturbance of diction.

Stammering may be of vowels, labial sounds, f and v, b and p, dental sounds d and t, palatal sounds k and g, n and g, lisping, l or r. There may be a syllable or word stammer. When of a high degree it is known as Hottentotism (Fournier) and is generally found in defectives.

Various pathological defects may be found: Mechanical from teeth and arches; labial and nasal; anomalies in formation of organs of articulation.

Stuttering occasionally develops at puberty. It is more frequent in boys than girls.

Stuttering and stammering is not an uncommon affliction which reacts both to the education of a child and its progress in later life. The child with this defect is self conscious of its existence and to avoid ridicule or comment becomes reticient and shy. Unfortunately lack of attention by physicians causes these cases to fall in hands of charlatans.

Causes of stammering are conscious or subconscious imitation, shock, weakness due to malnutrition; a psychoneurosis with fear to speak.

The organs entering into speech must first be free of any pathological condition or defect. Nasal obstruction, enlarged tonsils, cleft palate, tongue-tie, irregular teeth.

The child is ignorant of how to direct his efforts to produce normal speech. There exists tonic or clonic spasms of the muscles controlling speech.

Treatment requires good respiration, phonetics and articulation. Articulation is of minor importance until the child has stable speech.

The mouth is a transmitter and not an originator of sound. The mouth, jaws, lips and tongue should remain passive until the child has mastered exercises giving him control of his speech apparatus. Habit of deep breathing from diaphragm aids in self-control. A patient teacher who has sympathy and wins the confidence of a child facilitates recovery. All defects of speech should receive special instructions by special teachers for at least a part of each session. Much can be accomplished by the teacher having the child use a hand mirror to observe the manner in which he uses his mouth, teeth and lips. Special classes for speech defects should be organized in each large school, and part time spent under trained instructors.

THE TEETH.

There can be no doubt as to the value of sound, normal teeth to the health and comfort of a child. The teeth reflect the general health as well as an attempt at healthy living. Foul, unclean, and decayed teeth reflect a carelessness, want of cleanliness, and a disregard of the rules for personal hygiene. The school inspector can readily recognize decay in teeth, if on the anterior surface or grinding edges of the front teeth, but the primary trouble, which is the more

important, is more often hidden along the alveolar borders, between teeth or on the back molars. Again, the age of school children includes the periods from six to ten years, which is the transitional period between the going of the temporary teeth and the coming of the permanent ones. If the school children of a city were carefully examined by dentists, 95 per cent would be found with decayed teeth.

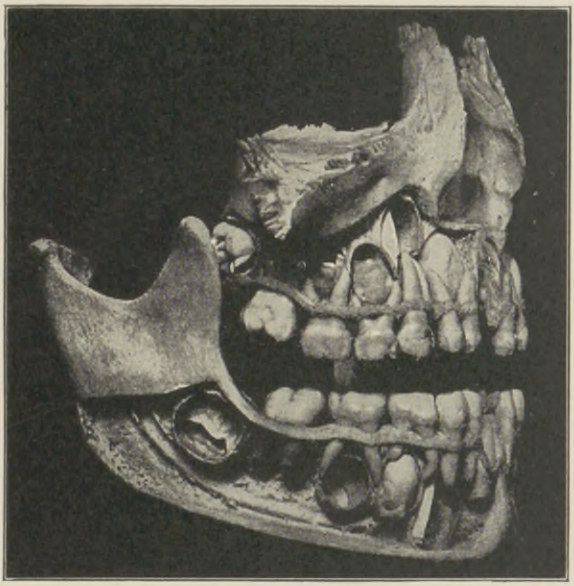


FIG. 58.—The complete temporary dentition and the first permanent molar. Note the relation of the bicuspids to the temporary molars. (In the seventh year.) (Noyes.)

For the above reasons, teachers, nurses and medical inspectors should devote time to teaching the children the hygiene and care of the teeth, the use of a tooth-brush, tooth-powder, and oral cleanliness. Examination of the teeth and necessary treatment should be left to dentists.

Where a city cannot afford to have a paid corps and a dental clinic, volunteers can undoubtedly be obtained.

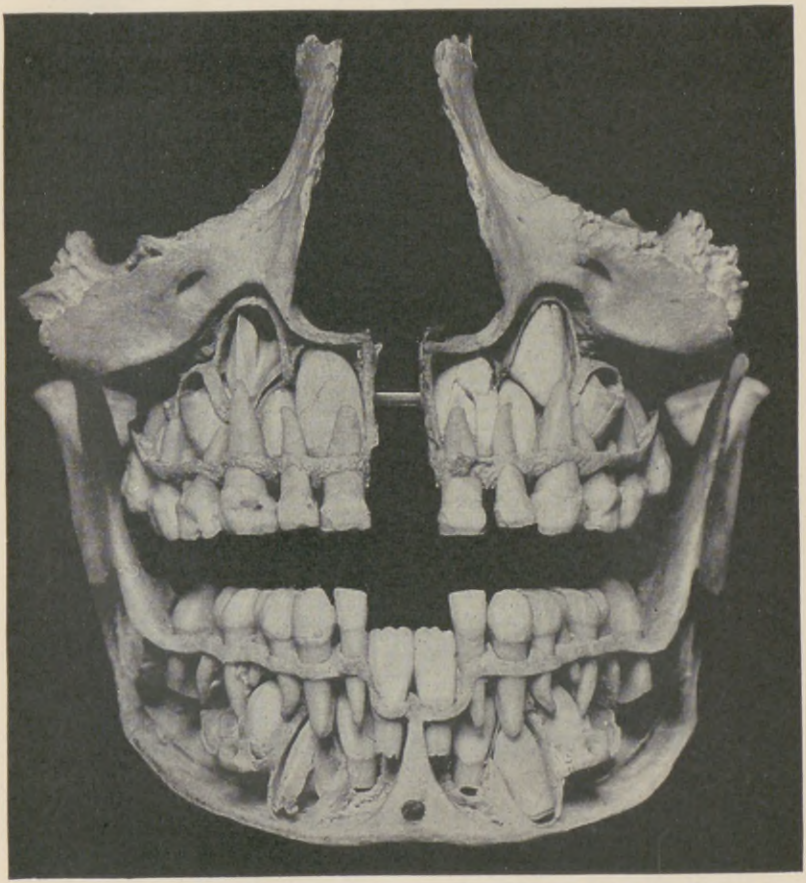


FIG. 59.—Front view of the skull shown in Fig. 58. Note the relation of the permanent incisors and cuspids to each other and the roots of the temporary teeth. (Noyes.)

Dental Clinics.—While in a number of cities some dental work is performed among the school children, but four cities have dental school clinics.

In Philadelphia a dental dispensary was organized October 5, 1910, with 210 volunteer dentists. The work was so successful that the following year money was appropriated

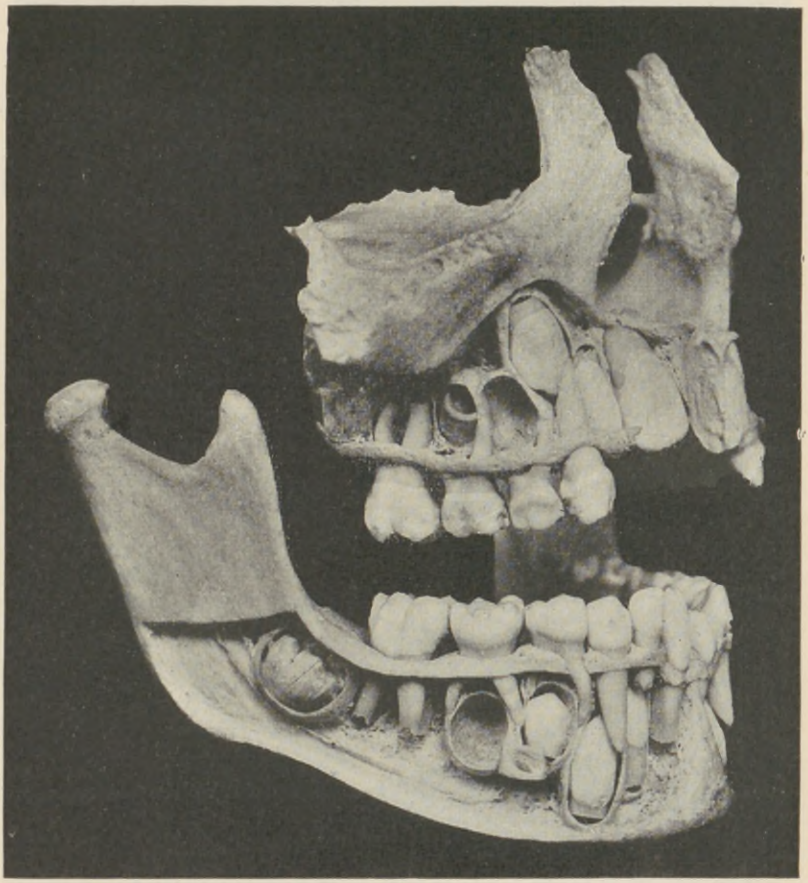


FIG. 60.—Dentition in the eighth year. Note the position of the cuspids and compare with Fig. 59. (Noyes.)

to pay 3 dentists $700 each per year. The central clinic at City Hall was supplemented in 1912 by a downtown school clinic.

In 1910 the equipment of the Dental Dispensary and the organization of the volunteer corps of operators and inspec-

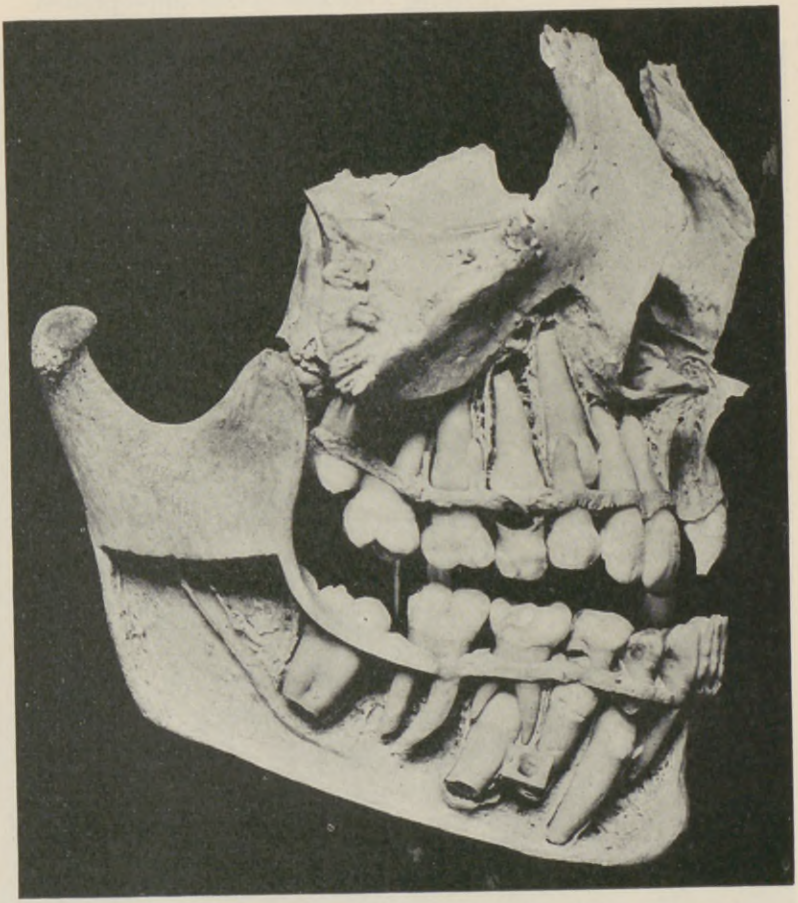


FIG. 61.—Dentition in the eleventh year. Note the growth of the cuspids and bicuspids. The second molar is about to erupt. (Noyes.)

tors were advanced to the point where the treatment of the teeth of school children could be begun. In the dis-

pensary there were two chairs in service, and by the end of the year, the equipment was completed by providing a third chair for administering nitrous oxide gas in such cases as required unavoidable extraction. One afternoon of each week was assigned for extractions, and on all other days the third chair was used for operations involving means of preserving teeth, which is the primary object of the dispensary.

The equipment is modern and complete. Special attention was given by the committee to devising forms and records with provisions for securing uniform procedure on the part of the numerous dentists who volunteered for the work.

The examination chart on pages 290 and 291 shows a specimen of the chart used and the methods of recording conditions found upon inspection of the teeth. These examination charts and also the clinical charts are printed on 5 by 8 cardboard in red ink to permit the legibility of black pencil marking.

New York.—The continuance of dental clinics in school buildings, rather than in centers where a number of schools could be served, has tended markedly to increase the success of the school dental work. The time lost by the children from their class work and the cost of rent, light and heating are diminished. Better school coöperation is obtained, and the fact that the work is actually done in the school makes the child more amenable to discipline.

The number of dental clinics established by the Department has slowly but steadily increased until, at the present time, there are 20 scattered throughout the various boroughs. Five in Manhattan, 4 in The Bronx, 6 in Brooklyn, 3 in Queens, and 2 in Richmond. Five of these—145 Worth Street and P. S. 43, Manhattan, P. S. 4, The Bronx, P. S. 6 in Queens, and P. S. 13 in Richmond—were opened during the past year. The clinics are run under the general

supervision of a part-time Supervising Dentist. There are 9 part-time dentists, working three and a half hours a day, and 5 full-time dentists, on duty from 9 A.M. to 5 P.M., 18 dental hygienists on duty from 9 A.M. to 1 P.M., and 17 full-time nurses, engaged in this service. This force is, of course, entirely inadequate to cope with the gigantic problem of giving much-needed dental services to the million or so school children in the city.

The main function of the dental clinic is to stress prevention. This does not necessarily imply that the enormous amount of corrective work should be neglected. Not all of the cases requiring operative treatment can be referred to outside agencies, as there is not a sufficient number of them to care for the 500,000 or more children with dental caries. Prevention, as applied to dental service in the school clinics, should carry with it the saving of the sixth-year molars by reparative work. Many of these teeth would be lost, otherwise, in spite of instruction in preventive measures.

This plan is the one that is being carried out at the present time. The school dental clinics limit their service to children of the lower classes, more particularly the 1A and 1B grades, except for emergency cases. The addition of 18 dental hygienists to the service has given added impetus to the importance of preventive measures, which include prophylactic treatment of the children of all grades, beginning with the 1A classes. Individual and class-room instruction in the correct manner of brushing the teeth is one of the most important duties of the hygienist. Particular pains are taken by the Supervising Dentist to see that the dentists exercise the greatest care in properly preparing cavities, so as to minimize possible loss of permanent teeth through carelessness or ruthless extraction.

Particular attention is also given to the preservation of the sixth-year molars. Operative work on pulpless teeth has been entirely eliminated from the dental service.

TABLE XXIII.—STATISTICAL REPORT OF WORK OF THE NEW YORK CITY DENTAL CLINICS, 1922.

Number of patients registered		9,287
Number of revisits		14,936
Number of visits to dispensary		24,223
Number of patients discharged		4,049
Cured	4,013	
Dropped	36	
Number of treatments		65,546
Number of temporary fillings		1,404
Number of operations		35,957
Extractions:		
Deciduous teeth		11,500
Permanent teeth		1,990
Number of permanent fillings		11,025
Number of cleanings		9,068
Other work		8,289
Prophylactic instruction:		
By nurse		21,613
By dentist		8,406
By hygienist		10,691
Consultations		32,488

Special Instructions.—The charts should be marked in *pencil* in order to avoid the accidental marks from blots if marked in ink.

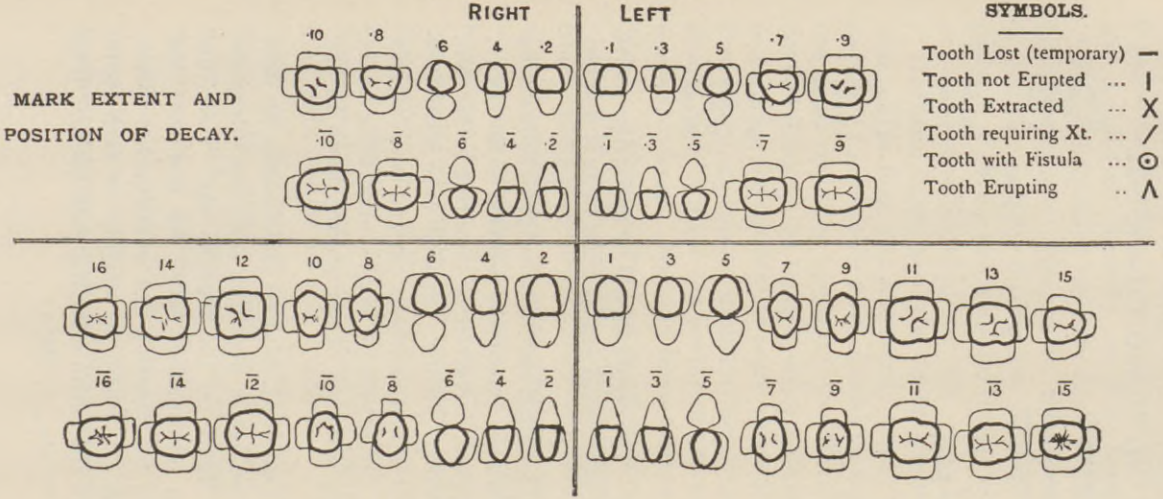
The essential points required should be supplied by marking on the chart of the teeth the extent and position of the decay, the teeth lost, not erupted, extracted, or requiring extraction, and those accompanied by fistulæ. Special care should be taken that the number of teeth actually present is accurately shown on the chart, as otherwise errors may arise as to the frequency of the presence of temporary teeth in the adult.

Enter age of child examined, in years and months, on date of examination. If the age is doubtful, place an interrogation mark after the figure on the reputed age. Carefully ascertain the general information called for and note the following instructions for marking the examination chart:

TEMPORARY TEETH. 1. Shade in roughly on each tooth diagram the extent of the caries affecting each tooth. (See specimen case 7, 8, 9, etc., p. 290.)

SPECIMEN EXAMINATION CHART.

MARK EXTENT AND POSITION OF DECAY.



(V) CHECK ANY OF THE FOLLOWING CONDITIONS FOUND.

STATE OF TEETH	TARTAR		No.	Hare Lip
Clean	Little	Natural arrest of Caries		Cleft Palate
Fair	Much	Fractured Teeth		Hard | | Soft
Dirty	TOOTH BRUSH	Fistulæ	2	Mouth Breather
Foul	Used	Fistula opening on Face		Much Caries | | Little Caries
Stained	Not used	Supernumerary	2	Enlarged Tonsils
IRREGULAR	Has none	Hutchinsonian Teeth		Necrosis of Bone
Upper		Honeycombed		Cicatricial Attachments
Lower		Teeth Filled		Closure of Jaws

DATE.	OPERATION.	OPERATOR.	DATE.	OPERATION.	OPERATOR.	DATE.	OPERATION.	OPERATOR.

2. Teeth lost should be indicated by a horizontal line drawn across the diagram thus:——(See specimen case ·2, ·4, ·1, ·3, etc., page 290.)

PERMANENT TEETH. 1. Teeth not yet erupted should be indicated by a vertical line drawn through the diagram of such teeth, thus: **I.** (See specimen case 6, 8, 10, etc., page 290.)

2. Teeth which have been extracted should be indicated by a St. Andrew's cross, thus: **X.** (See specimen case 11, page 290.)

3. Teeth which should be extracted should be indicated by an oblique line, representing one limb of the cross thus: / (See specimen case $\frac{/}{11}$, page 290.)

4. Shade in roughly on each tooth diagram the caries affecting each tooth.

5. Any fillings present may be indicated by a simple outline on the appropriate tooth diagram. (See specimen case 12, page 290.)

6. Note on the chart, over or under the appropriate tooth diagram, any existing fistulous opening, thus: ⊙. (See specimen cases $\frac{\cdot 8}{\quad}$ and $\frac{\odot}{11}$.)

If, upon investigation, the case is found to be a proper one for dispensary treatment, the following certificate should be used and the necessary treatment is given:

.....192.....

This is To Certify that.....age.....

Residence ..... School.....

District..... Grade.....

is in need of dental treatment and the parents are unable to pay for the same.

.....

Inspector.

.....

Principal.

Engagements with a child at the clinic are recorded on one of the following blanks, which is to be shown to the teacher and brought back to the clinic at appointed time:

Has an Appointment for		Attest When present
Monday	at	
Tuesday	at	
Wednesday	at	
Thursday	at	
Friday	at	
Saturday	at	

BRING THIS CARD WITH YOU.

Discharged ..... for ..... Months

Show this card to the teacher.

DIRECTION FOR BRUSHING THE TEETH.

Turn out about 1 teaspoonful of precipitated chalk into the palm of one hand, touch the chalk with the wet brush, and brush (1) up and down the inside of the lower front teeth, (2) the right and (3) the left side of the lower back teeth, (4) inside of the upper front teeth, (5) right and (6) left side of the upper back teeth, (7) outside of all teeth, upper and lower, brushing up and down.

To clean each of these 7 divisions, first wet the brush then dip it in the powder in the hand.

Brush the teeth at night and rinse the mouth night and morning with a teaspoonful of table salt dissolved in a tumbler of warm water.

Reports of the work performed each day should be kept on blank forms similar to the one here reproduced, and weekly and monthly reports rendered to the chief of the bureau.

BUREAU OF HEALTH—DENTAL DISPENSARY.

Dr. .....

Week beginning .....

NUMBER OF PATIENTS FOR WEEK.....

	SATURDAY.	MONDAY.
Absent.		
Examinations.		
Fillings.	Amalgam.	
	Gutta percha.	
	Cement.	
	Cu. cement.	
Pulps.	Capped.	
	Devitalized.	
	Extracted.	
Canals.	Dressed.	
	Filled.	
Ground, $AgNo_3$.		
Pulpitis.		
Pericementitis.		
Alveolar abscess.		
Stomatitis.		
Extractions.		
Gas administered.		
Cleansing.		
Discharged.		
Miscellaneous.		

Eruption of Teeth.—The table below gives the approximate time for the teeth of the two sets to erupt, but in individual cases they may come in earlier or later than the dates given, as these dates are only an average.

DECIDUOUS OR BABY TEETH.

Tooth.	Erupts.	Is Shed.
Central incisors	6th to 8th month	About the 7th year
Lateral incisors	7th to 9th month	About the 8th year
Cuspids	17th to 18th month	About the 12th year
First molars	14th to 15th month	About the 10th year
Second molars	18th to 24th month	11th to 12th year

PERMANENT TEETH.

Tooth.	Erupts.
Central incisors	7th to 8th year
Lateral incisors	7th to 8th year
Cuspids	12th to 13th year
First bicuspids	10th to 11th year
Second bicuspids	11th to 12th year
First molars	6th to 7th year
Second molars	12th to 14th year
Third molars	17th to 26th year

The first permanent tooth to erupt is the first molar, which is the sixth tooth from the middle line of the face and makes its appearance when the child is about six years of age. As this tooth is being formed in the jaw from the time the child is born, some of the diseases of children, such as scarlet fever or measles, may result in its being faulty in formation. In any event, it comes into the mouth at such an early age that parents should give it particular attention. This is especially necessary, as it is probably the most important tooth in the mouth so far as the future health of the child is concerned.

Shape.—If the permanent upper incisors are somewhat rounded and peg-like, tapering from the gums, with a discolored notch on the edge, they suggest syphilis. Keratitis and middle-ear disease associated with such teeth confirm such a diagnosis.

Loosening of the teeth, associated with spongy, bleeding gums, may be caused by lack of proper hygiene of the mouth, a mercurial stomatitis, pyorrhea alveolaris, possibly rheumatic, or it may be caused by scurvy or purpura.

Stomatitis, inflammation of the oral cavity, with or without carious teeth, is generally due to lack of proper hygiene of the mouth. This may vary from a simple redness with a few small ulcers to a gangrenous state of the mucous membrane.

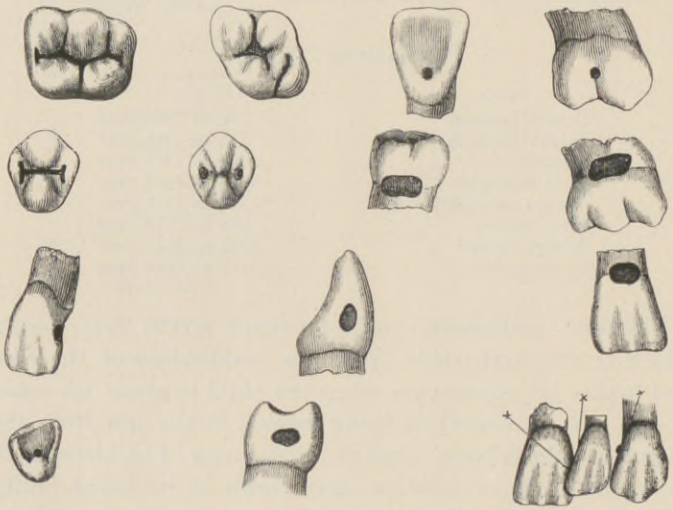


FIG. 62.—Forms of caries. (Burchard.)

The teeth are supposed to have their cutting edges meet the similar surfaces of the teeth in the other jaw, when the jaws are closed. There should be no large spaces between adjoining teeth. Irregular teeth not only mar the appearance of the individual, but the deformity detracts from their usefulness. Chewing may be interfered with and speech affected. There is also an increased liability to decay.

Irregular teeth are caused by heredity, certain habits

in childhood, such as sucking the thumb or comforters; diseases or growths in the nasopharynx, which may alter the shape of the mouth; and too early loss of temporary teeth by neglect and extraction. Each of the deciduous or temporary teeth is succeeded by a permanent tooth, and their relation in the jaw makes it necessary for the temporary tooth to remain until the permanent one is about to erupt.

Decay, or carious teeth, is often due to neglect. Heredity, race and general health are of equal importance. It is noteworthy how the colored race is often immune against decaying teeth. Food and how we eat is a factor. Proper nutrition from birth adds to teeth protection. When the signs and symptoms of decay are ignored, the pulp becomes involved, the tooth is destroyed, and infection may take place, attended by acute pain and swelling of the face, due to an abscess formation.

A warning should be given where an abscess has formed from a decayed tooth, not to poultice or apply heat to the face, as the abscess may rupture on the face and leave an unsightly scar after healing. Warm solutions in the mouth are more comforting, and if the pus comes to the surface, will cause it to discharge on the mucous surface.

THE TREATMENT OF CHILDREN'S TEETH.[1]

In any community where dental organizations exist available for public service, it would be a wise plan to first examine all the children subject to prospective treatment for the purpose of filling the first permanent molars before the pulps become involved.

When it is considered that at this age, with partially

[1] By P. B. McCullough, D.D.S., Philadelphia, chairman of the committee in charge of the Dental Dispensary, Department of Public Health and Charities.

calcified roots, the permanent usefulness of these teeth depends on a live pulp, and when the preservation of this organ vital or its exposure may rest on the narrow margin of a few days, the demand for action is apparent; that it may be saved for life, before exposure, by one or more simple operations requiring a few minutes' time as against an operation after exposure requiring superior skill, several hours' labor, and less promising results.

We may be justified in trusting to Nature to overcome the possible consequences to the permanent teeth from the premature loss of the temporary ones, but there is no remedy for the results attending decayed and neglected first permanent molars.

The choice of filling material for simple cavities in these teeth is no problem. Pink gutta-percha base plate serves every purpose; even though it be less durable than amalgam, its superior insulating property permits the pulp uninjured by thermal shock to continue its formative function. Furthermore, if decay exist at all at this age, it indicates a period of susceptibility due to a contributory constitutional cause, and this material offers the best protection during this time.

When the filling has worn to such an extent as to require a new one, choice of material should be governed by the prevalence or absence of susceptibility to decay. If the former state obtains, it is well to repeat the gutta percha; if the latter, amalgam may be substituted. In every case, phenol should be the last application preceding the filling.

In cases of extensive decalcification of the permanent molars without pulp involvement, copper cement or zinc phosphate is to be preferred. For fear of operative exposure all decalcified dentin need not be excavated; alternative is to be had in germicidal agents. Extreme care is required to preserve the pulps in these teeth alive, the permanency of the filling being a lesser consideration.

As one internal administration of a drug will not cure a

disease for which it might be specific, so does repeated filling help a sick tooth.

After the cavity has been prepared, observing the limitations stated, it is saturated with phenol, dried, then silver nitrate, then the cement.

Capping of an exposed pulp can, at best, be regarded as a tentative procedure. All that can be expected of the material is that it be non-irritating, germicidal, with some lasting antiseptic property, and have body. Such a combination we have in a paste of phenol, iodoform and zinc oxide. Cement is the best filling over this cap, because its durability is limited and, when refilling is indicated, opportunity is given to see the result of the treatment.

Whether this capping material or any other of the known combinations is used, there is one of three possible results: First, if the extent of pulp infection is such that it is not sterilized by the treatment, pain within a few days following the operation will require the removal of the filling and justify devitalization. Second, if structural change of the pulp has been such from the exposure that repair does not follow, then the pulp slowly dies, without pain, and, as a rule, without suppuration within the life of a cement filling. Third, rarely the pulp may and has continued vital under this treatment, sealing the exposure with calcific deposit.

Arsenic, a most valuable agent, need not be used to devitalize pulps in young teeth. The secret of pulp extirpation without pain consists in understanding the time required to produce desensitization. To this end, cotton wet with phenol, touched to iodoform and sealed on the exposure with temporary stopping to stay a few days or a few weeks, will be found effective.

Extension of the cavity, for direct access to canals, is necessary to thoroughness, and a reamer used to enlarge the mouths of the latter only. The use of any other engine tool is unnecessary and unmechanical. With smooth broaches and sodium potassium results are obtained heretofore impossible

The distal canal of the lower and the palatal canal of the upper molars are best filled with pink gutta-percha base plate. Out of regard for accuracy, a set of canal pluggers has been designed of graduated sizes so that, when a large foramen presents, it may be sealed with precision. Beginning with a small plugger, successive sizes are tried until one is reached that will not pass the opening, then the next size larger is selected to place the gutta-percha seal.

The distance from the end of the plugger, when in place, to the foramen is measured, and a point rolled of such length and uniform diameter, the plugger heated and touched to the point, the canal flooded with alcohol, dried (not desiccated), then moistened with phenol, which allows the softened gutta percha to slide along the walls of the canal without bending. When cajuput or eucalyptol is used, it is better to place the drug in the canal rather than dip the point in the solvent.

Oxychloride of zinc, when properly made, is a superior filling for the mesial canals of lower and the buccal canals of upper molars. It can be pumped to place with smooth broaches, and pressed with cotton pledgets without danger of forcing it through these canals, when normal. A drop of glycerin at the time of mixing retards setting.

For the treatment of infected root canals formaldehyde is the most potent germicide, but, as such, it requires judicious handling. A paste made of 3 grains each of iodoform and precipitated chalk, with water and alcohol and 1 drop of formalin, is as strong as this gas can be used not to cause peridental irritation. This mixture can be readily pumped into canals where it would be difficult to place cotton threads.

The object of the combination is primarily to provide convenient distribution of the formalin, the iodoform as a more lasting antiseptic and the chalk as a convenient vehicle.

Odontalgia.—With time, skill and care, it may be said, as general statements go, that every operation we are called

upon to perform for children can be done without pain, except extracting, and, correlatively, it is equally true that it is never necessary to extract to relieve toothache.

The first step in a contemplated remedy is diagnosis: an intelligent attempt to relieve pain is possible only after an understanding of the cause. Toothache is a symptom of pulpitis or pericementitis. If it be the former, the cavity is to be closed; if the latter, it is to be opened. Phenol is a superior remedy for producing instant relief for pulpitis. Opening the pulp cavity in pericementitis usually afford relief in twenty minutes; occasionally, the relief is immediate.

Soreness to pressure, usually pathognomonic of putrescent pulp, should be regarded as positive only after it is proved, for occasionally we find pus in the pulp cavity while the pulp is still sensitive, with pericemental involvement from extension of the inflammation. In these cases relief is obtained by careful extension of the exposure to relieve pressure, followed with phenol to stop pain. This dressing sealed in for three days usually permits the removal of the pulp at the end of this time.

With pericemental involvement beyond this stage means incipient abscess from putrescent pulp, the first indication being free vent without attempt to enter canals lest mixed infection be forced through. If, after a day, relief from pain is not obtained, then partial mechanical cleaning of the canals is indicated, followed with the formalin paste and temporary seal, the application of formalin to the gum as a counter-irritant and the constant use of a capsicum plaster or a hot fig. Such procedure is designed as tentative treatment to abort an abscess, and, while often effective, positive prognosis of the immediate outcome cannot be made.

If the state of development of the inflammation is such that resolution cannot be established, then this same treatment helps suppuration without causing it. The patient should be seen daily, and if pus does not result within three days from the appearance of the swelling, then the canal

dressing should be changed at once; again in twenty-four hours, then in two days, and the last treatment left for several days as a precautionary measure before filling.

The Temporary Teeth.—Cavities in the temporary molars, more frequently than in the permanent ones, are in the proximal surfaces, and, regardless as to whether the occlusal surfaces are involved, they should be so extended for direct access. It will, as a rule, be found the best practice to fill these cavities with amalgam that the one operation may last the life of the tooth. Time is saved by using a matrix. Tin-foil burnished over the surface of the filling, extracts excess mercury and speeds hardening. Finishing beyond removing excess material, as the gingival margin and clearing the occluding tooth, is unnecessary. Phenol should be the last application before filling.

Apparently reflecting their destined transitory purpose, pulps in these teeth show less resistance than those of the permanent ones, together with the fact that the pulp is sooner involved by decay explains why capping is less frequently indicated.

It may, however, be the means of prolonging the time for a more extensive operation, and, for this reason, serve an important purpose in dental child-training because of the painlessness of the procedure. Again, in the event of an operative exposure the material given being both anesthetic and antiseptic, prevents postoperative pain and suppuration. At the time when the wearing of the cement filling would require further treatment, the course to be pursued would be governed by the time yet remaining for the permanent successor to erupt.

When devitalization is required, the same method recommended for the permanent teeth will be found effective; subordinating quick results to the avoidance of pain. The mechanical and chemical treatment of the canals is necessary as before stated. With the superior virtues of sodium potassium, sulphuric acid should not be used. Oxychloride

of zinc, to the powder of which is added iodoform at the time of mixing, is pumped in all the temporary root canals, observing care to avoid pressure. As it is to be expected that such work would only be spent on a tooth having several years to remain, amalgam becomes the logical finishing filling.

A Last Resort to Avoid Extracting.—It is of daily occurrence among neglected little children to see a temporary molar pulpless, with pericemental attachment that would be painfully resistent to the forceps, with one year or more remaining before the time for the normal appearance of its permanent successor, with the limitations of time and poverty curtailing the to-be-desired remedy and pity forbidding extracting.

More than this, possibly all of this first set with ragged enamel margins surrounding cavities housing infectious bacteria, unchanged, by mastication, or washed by the oral fluids, until from decalcification, pericemental and alveolar necrosis all are lost-like sequestra. A condition causing septicemia oftener than is recorded demands quick remedy.

We all have seen crownless roots in the mouth, even with the gum line without abscess or noticeable pericemental infection, lost after years by slow decalcification of the exposed surfaces, atrophy, and exfoliation without the sign of pus.

Observation of this fact suggested the feasibility of artificially producing this condition as a measure of last resort to prevent the consequences resulting from premature extracting.

One preliminary requisite for alveolar abscess is the lodgement and protection which a partially enclosed carious cavity affords to pus-producing bacteria—it is the mechanical requisite—therefore, with this removed, we have destroyed one of the essentials necessary for the production of pus, and happily, as with all our work, some trust must be given to Nature's support, so does it follow here.

With a large corundum stone revolving across the portion of the tooth to be removed, the buccal and lingual walls are ground away to the gum line, leaving the likely one sound wall remain, the walls of the pulp cavity are burred out to diverge from the floor, the fistulæ irrigated with germicides, the exposed tooth surface treated with silver nitrate and the child told to wash the mouth with salt (sodium chloride).

The remaining mesial or distal wall, if any remains, in time breaks away, the free opening permits changes of the lodging food débris by mastication and free access of the changing fluids in the mouth, the canal mouths offer less resistance to the egress of the products of fermentation than does the apical ends.

By this simple and quick mechanical measure the formation of pus is stopped, space is conserved for the permanent teeth, and the operation is painless.

Dr. Andrew J. Seeler, of Philadelphia, has given to the author the following method of filling teeth of children and for which great success is claimed: Use eugenol (active principle of oil of cloves), which is highly antiseptic and anesthetic. A paste is then used consisting of creosote 10 per cent; thymol 25 per cent; powdered resin 5 per cent. This is covered with black copper oxide cement.

Dental Hygienists.—Ample dental service is seldom found in any city. The nearest to supplying the need is found in the Forsyth Dental Infirmary in Boston, the Eastman Foundation in Rochester and the contemplated Pageant Foundation in Chicago. The average city is not equipped to care for more than 5 per cent of those needing dental care. The Forsyth Clinic is equipped with 65 chairs for children, each in charge of a competent dentist. Fear is dispelled before the child enters. Extraction is performed in separate small sound-proof rooms. Novocaine is used in preference to a general anesthetic. There is in connection with the infirmary a hospital with operating rooms and 10

available beds for nose and throat diseases. They also maintain a training school for dental hygienists, offering an eight months' course. The course includes anatomy, physiology, bacteriology, dental hygiene and pathology, oral prophylaxis and nutrition.

The most practical solution of the dental problem is the well-trained corps of dental hygienists. This fact has been recognized and acted upon in many cities. Boston has 54, Philadelphia has 26 working three hours per day for five days per week. Each renders service to 20 pupils per week. Chicago has 6 dentists working four hours per day. They work in twelve centers, and attended in 1919 to 14,323 children; in 1920, 17,435; in 1921, 9904.

The functions of hygienists are: (1) Giving prophylactic treatment; (2) teaching oral hygiene and associated health instructions on nutrition, etc.

It is necessary for success to supplement this work by teachings given by teacher and nurse.

ORTHOPEDIC DEFECTS.

The chief orthopedic defects can generally be detected as the child walks toward the examiner, but owing to the fact that it is forbidden to undress a child for examination, the moderate defects are more likely overlooked. Of the more apparent defects, coxalgia or hip deformity, which may be due to injury or disease around the joint (generally tuberculosis), may be observed by the characteristic gait. Defects such as wry-neck or torticollis are apparent to even a non-medical examiner, as also are knock-knee (genu valgum), eversion of knees; inversion of knees (genu varum); and club-foot (talipes).

If a curvature of the spine is well-marked there is little need for a special examination, but where a moderate amount of defect exists, diagnosis can be made only by undressing the child. Before diagnosticating spinal curvature, the

examiner should be assured that the manner of dress is not simulating a defect. The author has frequently observed a foreigner who seemed to be a hunchback, but the supposed defect proved to be only a bunch of clothing huddled on the back drawn up by a pair of tight suspenders on a boy or ill-fitting clothing on a girl. Where a child comes from a cold climate it is not unusual for it to be clothed in three or four shirts and as many petticoats and dresses.

Scoliosis.—Scoliosis, or abnormal curvature of the spine, is often found among school children. Investigation by authorities in the United States and other countries show this defect to exist in varying degrees in about 20 per cent of the school population. Much of this may be termed a functional or habit scoliosis. The percentage is slightly greater among boys than girls. There are some authorities who believe this is reversed. The common type of school deformity is a functional or false scoliosis, and not a severe structural form (Figs. 64 and 65). There exists a moderate degree of convexity toward the left. These cases are mostly due to faulty positions in standing or sitting.

The other variety or degree of scoliosis is readily diagnosticated and includes marked structural changes and deformities. It occurs where a child is weak, poorly nourished, and lacks bone and muscle resistance, in addition to faulty posture. Diseases and defects which reduce the vigor and health of the child, decrease its resistance to abnormal and long-continued strain, and predispose the child to spinal troubles. Habitual bending over desks while reading or writing produces a posterior curvature or kyphosis of the spine. If a twisting of the body is added to this faulty posture there results a scoliosis or lateral curvature. There can be no doubt that faulty school furniture, with improperly adjusted seat and lack of support for the back, is an important factor in causing spinal deformities.

Other Defects.—Kyphosis is a posterior curvature of the spine with the convexity directed backward. It may be due

to rickets or long-continued illness. The examiner should bear in mind that there may exist normally an unusual prominence of the seventh cervical or eighth and ninth dorsal vertebræ.

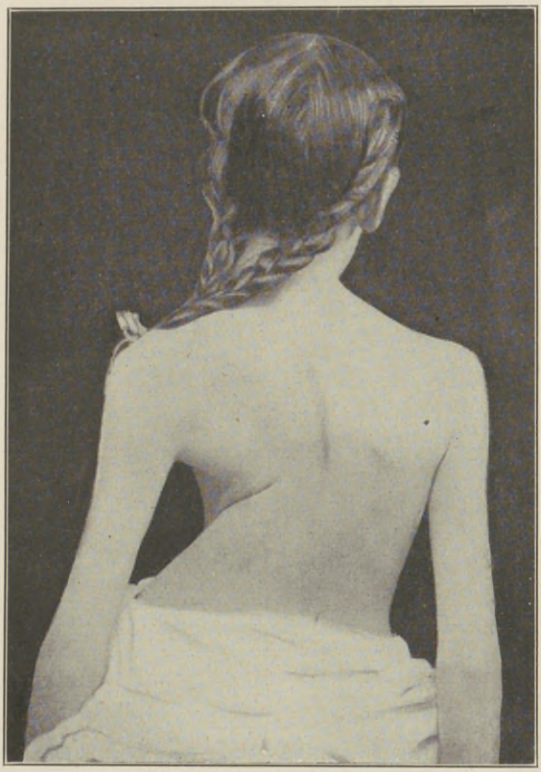


FIG. 63.—Scoliosis with extreme lateral deviation. (Whitman.)

Lordosis consists of a curvature with the convexity forward noticeable in the lumbar region.

Stoop shoulders or round shoulders is chiefly a defect due to habit, though augmented by poor physical condition and

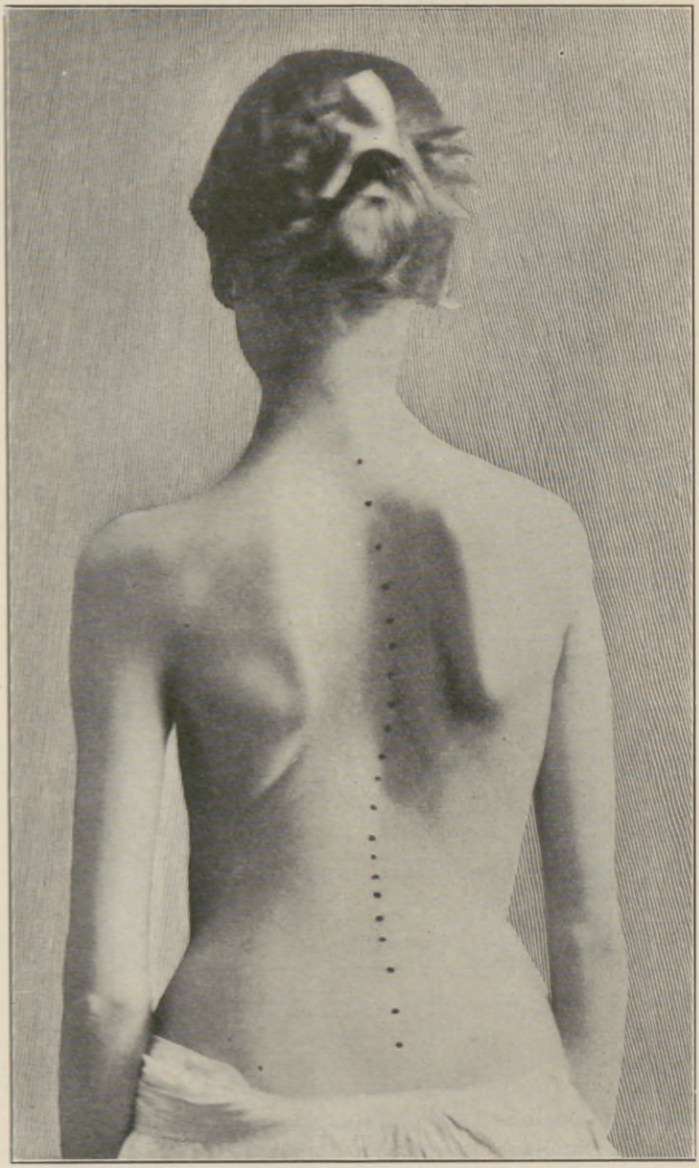


Fig. 64.—Typical lateral curvature. Right dorsal. Left lumbar. (Whitman.)

malnutrition. The habit may be acquired by stooping over to read and write when defective vision is present. Persistent training is required for its correction, and in addition,

FIG. 65.—Marked lateral deviation of the spine, with rotation. Deformity at the eight dorsal vertebra. (Whitman.)

braces are often needed. Tonics, nourishing food, and fresh air aid in the treatment.

Marked orthopedic defects are often acquired in infancy, due to rickets and other diseases affecting nutrition. These

cases require surgical interference. Curvatures of the spine are often caused by habits of faulty posture in standing or sitting, desks and chairs not suited to the size of the child, carrying heavy loads on one shoulder, etc. Care should

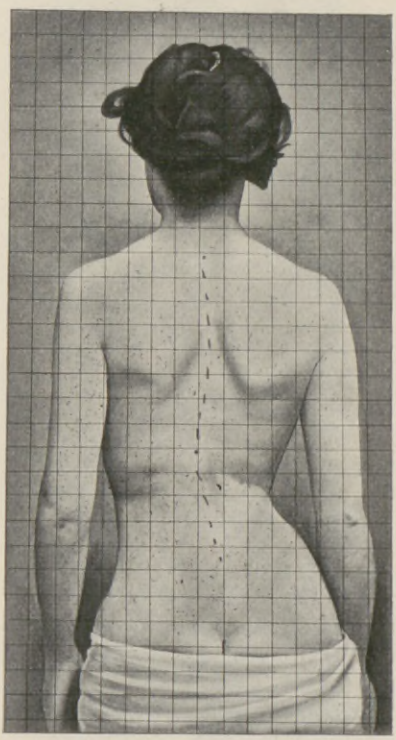


FIG. 66.—The thread screen. (From the Boston Children's Hospital Report.) (Whitman.)

be exercised in the hygiene of the school-room with relation, to the posture assumed when sitting or standing. Proper desks and seats should be supplied and the teacher should at all times correct faulty posture. Physical exercise as practised and taught in most schools accomplishes much in

encouraging standing erect, and some of the exercises are important in the correction of moderate degrees of spinal curvature and deformity.

SKIN DISEASES.

A knowledge of dermatology, especially the differential diagnosis, is essential for the proper examination of school children. Almost any of the many diseases of the skin may be found among the pupils, but in the following pages the field is covered only so far as it is of interest and value to the school examiner, and unnecessary detailed descriptions of the diseases omitted. It is the duty of the school physician to recognize every eruption on the skin, to promptly eliminate the contagious from the non-contagious, and to protect the school from an epidemic of an infectious disease or a contagious skin disease. The spread of contagion in a school may reflect upon the efficiency of its attending inspector, and he must, therefore, be mindful of those eruptions which are secondary to and symptomatic of the exanthemata.

Most of the symptoms are objective and visual, and the diagnosis must generally be made by the eyesight alone. It is impossible to represent in words the manifold impressions of the characteristics, color, and shape of the various lesions which should be seen and studied to admit of diagnosis of similar cases.

For the purpose of school inspection, skin diseases may be classified into:

1. Systemic contagious diseases, including measles, scarlet fever, smallpox, vaccinia, chicken-pox and German measles.

2. Non-systemic contagious skin diseases, including ringworm of scalp, ringworm of body, favus, scabies, impetigo, and pediculosis.

3. Non-contagious skin diseases, of which the most fre-

quent are eczema, acne, herpes, urticaria, alopecia, carbuncles, furuncles and psoriasis.

Contagious Diseases.—The group of systemic contagious diseases belongs rather to the domain of general medicine than to dermatology and has been considered in the part on "Infectious, Contagious and Communicable Diseases."

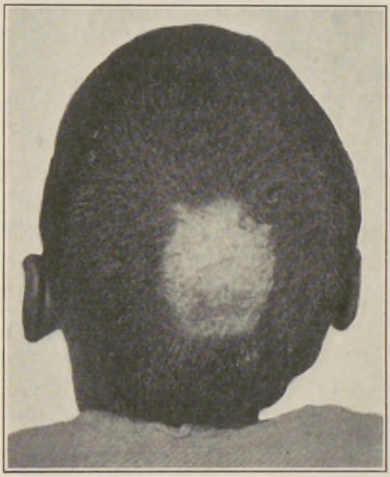


FIG. 67.—Ringworm of scalp. (Knowles.)

In making a diagnosis the inspector should consider the character of the eruption, the lesions, their location and distribution, the history and mode of invasion, and the association of systemic symptoms.

Ringworm of the scalp is a parasitic disease of the scalp characterized by circular or diffuse, inflamed, scaly patches, with diseased and broken-off hairs. It is of common occurrence in children, and generally covers an area of not more than 1 or 2 inches. At the margins of the patch are found inflammatory papules, vesicles and pustules, and the broken-off hairs are covered with a grayish dust. Ringworm can

be diagnosticated from favus by the absence of the peculiar sulphur-yellow, cup-shaped crusts.

Ringworm of the body occurs most frequently on the arms, face or neck. It begins as a small, circular, slightly raised, circumscribed area, which enlarges peripherally and the margins remain red and composed of papules and vesicles covered with a fine scaling, and the center gradually fades. It must be distinguished from eczema and psoriasis.

Favus is a contagious parasitic disease most often on the scalp. Its characteristic form is lemon- or sulphur-yellow, cup-shaped crusts, firmly adherent to the scalp, and when

FIG. 68.—Ringworm with two rings. (Knowles.)

they come away there remains a deep pitting from loss of tissue. There is a peculiar odor, sometimes termed "mouse odor," which accompanies the disease.

Scabies, or "itch," is a contagious animal parasitic disease characterized by itching and various lesions of papules, vesicles, pustules, crusts and excoriations, chiefly on the hands, abdomen, and inner aspect of the thighs. The itching is most severe at night, because the parasite is more active at that time. The burrows appear as white or yellow streaks, about $\frac{1}{4}$-inch long, and dotted with minute black spots.

An itching rash on the back of hands with scratch marks and burrows between the fingers should suggest scabies. When possible it is well to confirm the diagnosis by examining the lower abdomen and inner parts of thighs for a similar rash. The inspector should inquire if others in the family have the disease, and examine all children of that family who attend school.

FIG. 69.

Impetigo contagiosa is an acute inflammatory contagious disease appearing in isolated patches of vesicles, pustules, and crusts, generally on the face. It is to be distinguished from eczema.

Pediculosis of the head is characterized by the appear-

ance on the scalp of the live pediculus and its ova, and a secondary eczema and dermatitis, which may spread to the face and neck. If unattended, the hair becomes matted together into a foul-smelling, decomposing mass of crusts and dirt. The vermin are freely communicated in the schools,

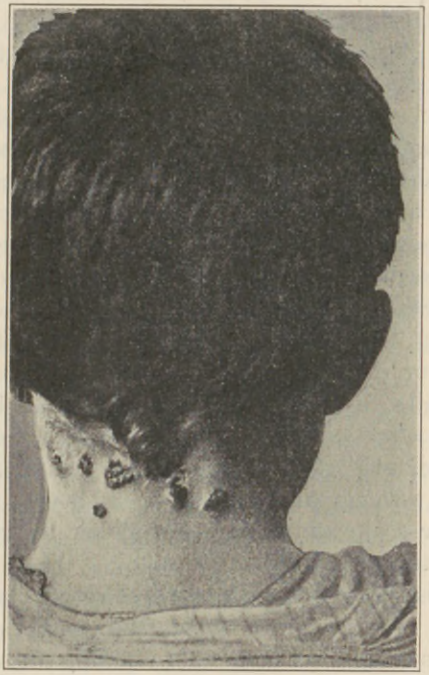


FIG. 70.—Lesions on neck from pediculosis. (Courtesy of Dr. S. I. Rainforth.)

especially where there is an interchange and close contact of hats and wraps. It is the most common of all skin diseases and the examiner must not be deceived in diagnosticating the disease, by the fact that the children are clean, well-dressed, or from so-called good families. Suspicions should be aroused whenever there exists a rash with scratch marks

on the back of the neck or parts of the body where clothing comes in close contact, as on the shoulders. The vermin and nits are readily seen among the hairs.

On the body, pediculosis appears as minute red dots surrounded by a wheal, together with crusts and scratch marks, due to the itching. The location of the lesions on the neck, waist band, shoulders, buttocks, and thighs and the finding of the parasite distinguishes the disease from eczema and other affections.

Treatment.—All children with an eruption suspicious of the acute infections, and any contagious skin disease not under treatment, should be excluded from school. Scabies should be excluded until cured; pediculosis, until no vermin can be found. Impetigo and ringworm may be allowed in school if under treatment and painted with tincture of iodine or collodion. Scabies should not be treated at school, but the nurse may go to the home and instruct the mother how to apply sulphur ointment. Applications on three successive days generally make it possible for the child to attend school with safety. Care must be exercised that the child does not reinfect itself through its clothing, especially pockets, or through the bedclothing at home. Both ringworm of the scalp and favus are difficult to treat, having a tendency to be chronic.

Pediculosis should not be treated at school, and as treatment must take place at home, the parents should be instructed as to the best method of cleaning the scalp. With many parents, considerable diplomacy is needed in notifying them of the existence of the condition. Antagonism can often be avoided by giving the impression that the origin of the contagion rests with some other pupil in the class-room, and thus avoid any suggestion of uncleanliness in connection with the child under treatment.

The following circular of instructions for treatment is also effective:

Notice to Parents.

When a pupil of the public school is excluded by the assistant medical inspector on account of having an unclean head, the following remedies may be resorted to in order to cure the condition:

Take equal parts of kerosene oil and sweet oil—mix and saturate hair and scalp thoroughly with the mixture. Tie head in towel and leave it so one night. Next morning wash the child's head with hot water and soap, and remove all traces of the oil. After thoroughly drying, saturate with vinegar, separating hair into strands, and brush with stiff brush.

After such treatment, the pupil may return to school and inform the medical inspector what has been done; or the parents may send a note, indicating what treatment pupil has had. If result is satisfactory, pupil may be readmitted.

Non-contagious Diseases.—The non-contagious skin diseases are numerous and a few, including eczema, acne, herpes, and urticaria, are frequently found among school children. It is unnecessary for the examiner to be acquainted with all of these diseases, as, aside from the discomfort given the child, they rarely interfere with its education. Treatment should be insisted upon in all cases.

DISEASES OF THE NERVOUS SYSTEM.

The medical examiner of school children may diagnosticate only those diseases of the nervous system which have characteristic symptoms, such as chorea or epilepsy. Unusual nervousness or lack of nerve control cannot be diagnosticated by a mere inspection, as it is natural for some normal children to be unduly nervous when appearing before a stranger. This is especially so when the child knows it is a physician whose purpose is to examine him. In these cases the diag-

nosis by an observing teacher is of more value. If the inspector sees a child in a paroxysm he may diagnosticate epilepsy, otherwise the history of the case as given by teacher and child is sufficient evidence. Chorea shows some symptoms most of the time, while hysteria shows symptoms when watched and must be caught off guard.

Epilepsy consists of periodical paroxysms of convulsive attacks with a loss of consciousness. These paroxysms vary in frequency and severity. The cases vary from the mildest attack of "petit mal" to the severe "grand mal."

These cases are dangerous in a public-school room, not only because they upset the discipline of the class, but on account of the danger of a child falling and receiving an injury during an attack. A case with frequent attacks is, therefore, sufficient cause to exclude a pupil from school.

The cause of epilepsy may be syphilis, traumatism in rare cases, reflex irritation from genital organs, masturbation, and eye-strain. Heredity undoubtedly plays an important role.

Several investigations have shown that errors of refraction and muscular eye trouble are found in a large percentage of cases of epilepsy. While this does not necessarily mean that these errors are the cause of the disease in all cases, it is logical to infer that the ill-effects on the nervous system, especially in children, are an important factor.

Every case of epilepsy should receive a thorough systematic examination of the eyes, not only for refractive errors, but muscle imbalance, and it is the duty of the medical officer and teacher to see that parents obtain such an examination and the proper treatment. A number of cases have been reported cured by such treatment.

Chorea, commonly known as St. Vitus' dance, is frequent in children and while heredity is an important factor, the general history may show some previous injury, shock, or fright, reflex irritation from the genitals, intestines, dentition, or eyes. The disease may be acquired by imitation. Therefore, in chorea, epilepsy, and other nervous diseases

the eyes should be examined under a mydriatic. Habit spasm, consisting of gestures, shrug of shoulders, winking of eyes, or grimaces, may be the remains of a previous attack of chorea.

Hysteria is rare among school children until puberty or after the age of twelve. Imitation may be found in some cases of hysteria. The symptoms manifested are as varied as the number of cases, and may include disturbances of the sensory organs, motor apparatus, and even visceral disturbances. The absence of any organic disease, and, upon careful watching, the discovery of certain symptoms characteristic of hysteria, may aid in a correct diagnosis.

SYSTEMIC DISEASES.

General Considerations.—It is beyond the scope of medical inspection to definitely diagnosticate the diseases which belong to the field of internal medicine. Scientific conscientious physicians require a thorough examination of a patient before rendering a diagnosis. The school doctor in his routine work has neither the time, the place, nor the equipment for such work, and even though he had the opportunity, neither the child nor the school would benefit by the work. All cases presenting symptoms of visceral trouble should be referred to a physician or dispensary for diagnosis and treatment. An old-fashioned "bellyache" by symptoms may prove appendicitis on careful examination. The author does not approve of the disrobing of a child in school for an examination of the chest or abdomen, and the mere placing of a stethoscope over the clothing does not warrant a diagnosis of cardiac or pulmonary disease. When symptoms exist the school doctor should recommend a visit to a physician or the dispensary.

Frequently a child is sent to the school doctor for examination of the chest to determine fitness for physical exercises. In these cases an examination should be made of the pulse,

respiration, and heart sounds as revealed by ear alone or aided by a stethoscope. All children giving signs or symptoms of cardiac insufficiency should be debarred from entering physical contests. Defective breathing, if based on mere routine inspection, is very common among children, due chiefly to habit. Physical exercise, a part of the curriculum of most schools and public playgrounds, has done much to eradicate this defect.

Heart Clinics.—Diseases of the heart and vascular system stand among the first in a list of mortality. These deaths are chiefly among adults and in later life, but the beginning is too often in childhood or early life. Examinations of school children shows the percentage of cases is less than 0.5 of 1 per cent. There are many found with mitral murmurs which have no significance as an organic heart lesion, but many of these cases are due to vascular changes which should be watched. The importance of the subject, because of the high death-rate among adults has resulted in the past two years in many active campaigns. Heart clinics have been established in many cities, uniform records made and cases scientifically studied, school physicians have been urged to send to such clinics all children who have symptoms of rheumatism and chorea. These are carefully examined and watched.

Below is given the list of cities in the United States and Canada in which Associations for the Prevention and Relief of Heart Disease have been formed also a list of cities which have cardiac clinics where associations may be formed in the future:

New York City, an association with 38 cardiac clinics.
Chicago, Ill., an association with 8 cardiac clinics.
Boston, Mass., an association with 6 cardiac clinics.
Montreal, Canada, an association with 1 cardiac clinic.
Hot Springs, Ark., 1 cardiac clinic.
Toronto, Canada, 1 cardiac clinic.
New Haven, Conn., 2 cardiac clinics.

Des Moines, Iowa, 2 cardiac clinics.
Indianapolis, Ind., 1 cardiac clinic.
Brookline, Mass., 1 cardiac clinic.
New Bedford, Mass., 1 cardiac clinic.
Worcester, Mass., 1 cardiac clinic.
Detroit, Mich., 1 cardiac clinic.
Minneapolis, Minn., 2 cardiac clinics.
St. Louis, Mo., 2 cardiac clinics.
Cleveland, Ohio, 1 cardiac clinic.
Pittsburgh, Penna., 1 cardiac clinic.
Memphis, Tenn., 1 cardiac clinic.
Milwaukee, Wis., 2 cardiac clinics.
New Rochelle, New York, 1 cardiac clinic.

There are associations in 4 States in the United States and 1 in Canada. There are cardiac clinics in 14 States or 23 cities in the United States and 2 in Canada.

No better information and instructions can be offered than that given to medical officers during the late war.

CIRCULAR No. 21.

WAR DEPARTMENT,
OFFICE OF THE SURGEON GENERAL,
Washington, July 14, 1917.

The following is published for the information of medical officers in the examination of the heart and bloodvessels of candidates for the military service.

The duties of the examiner are:

1. To exclude from active service in the Army any man affected with disease of the heart or bloodvessels which impairs his ability to undergo severe bodily exertion.

2. To hold to the service men who have been recommended for rejection or discharge because of supposed defects which do not indicate disease and do not impair the individual's ability to undergo severe bodily exertion.

3. To determine the importance of definite defects in the case of candidates for special service, not entailing severe

bodily exertion, and to recommend acceptance or rejection for such special service.

Men who desire to serve their country may from patriotic motives endeavor to conceal a known valvular lesion which has given no symptoms. On the other hand, men drafted for service may allege or feign symptoms to obtain exemption. Conscripts may be expected to present physicians' certificates to substantiate the existence of valvular disease. Many of these may be given in good faith, because of inadequate knowledge of the significance of certain frequent murmurs. On the other hand, a slight but important valvular lesion, most often mitral stenosis, may be overlooked because the murmur is inconspicuous, and serious harm to the individual and loss of time and money to the Government may result.

It is necessary, therefore, that the conclusions of the examiner shall be based on objective evidence in the widest sense, including both physical signs, cardiac rhythm, measurement of the blood-pressure, and the observed effect of effort. Nevertheless, in the presence of questionable signs or symptoms the history, especially of past rheumatic fever, may be a factor in the final decision. No statements of the subject, however, will be accepted as proof of the existence of a cardio-vascular defect, unless supported by objective evidence.

It will be necessary to exercise every care in the interpretation of their findings and to bear in mind constantly the murmurs and other departures from the supposed normal which may occur in perfectly healthy hearts.

The examination should in all cases include:

1. Location and determination of character of apex impulse.
2. Auscultation of the heart sounds over apex, lower sternum and second and third interspaces to right and left of sternum, noting accentuation of sounds and murmurs.
3. Inspection of root of neck and upper thorax and percussion of first interspace on each side of manubrium for evidence of aneurism.

4. Count of radial pulse, observation of its rhythm, and palpation of radial arteries for unusual thickening or high tension.

5. Exercise test: Hopping 100 times on one foot. At close count heart rate with stethoscope over apex, listening for murmurs and noting how long tachycardia and unusual dyspnea persist. After two minutes neither should be marked.

The examiner should bear in mind the evidences of valvular disease which may easily be overlooked. Slight mitral stenosis, in particular, may give rise to a murmur so faint that it may be audible only after exercise or when recumbent. A definite accentuation of the pulmonic second sound or a snapping first sound should always suggest careful scrutiny for other evidence of mitral disease. A slight aortic diastolic murmur, audible in a limited area to the left of the sternum below the third rib, may also be passed over. Distinct ringing character of the aortic second sound may indicate either high blood-pressure or dilatation of the aortic arch and should be watched for.

Principles of Interpretation.—The following principles are laid down for the guidance of examiners in their interpretation of abnormal signs and symptoms. In many cases the interpretation must be purely individual and based on the cumulative evidence of a number of relatively slight deviations from the normal. It cannot be too strongly insisted on that, given a heart of normal size and responding normally to effort, any murmur that is heard should be considered accidental and insignificant unless it can be positively demonstrated that it is a mitral or aortic diastolic murmur. It should also be constantly borne in mind that the excitement of the examination may produce violent and rapid heart action, often associated with a transient systolic murmur, which effects may erroneously be attributed to the effects of exertion. They will usually disappear promptly in the recumbent posture, but the examiner must be shrewd to

distinguish the excitable individuals and take measures to eliminate psychic influences from the test, so far as possible.

1. *Hypertrophy and Dilatation of the Heart.*—Impulse to the left of the nipple line or below the sixth rib and of heaving character is cause for rejection. Its cause, either valvular disease or hypertension in the majority of cases, should be sought for. It should not be made a primary diagnosis unless careful examination fails to reveal a cause.

Impulse within these limits, but definitely heaving, or relative cardiac dulness extending to the left of the nipple line, or more than 4 cm. to right of the median line in large, more than 3 cm. in small individuals, should lead to careful examination for valvular disease, high blood-pressure, emphysema, or other cause. Unless such other cause can be found, the response to exercise shall be the guide. Those cases with normal response to exercise may be accepted for special service (3); all others shall be rejected.

2. *Valvular Diseases.*—Cardiac murmurs are the most certain physical signs by which valvular disease may be recognized and its location determined, but murmurs are very frequent in the absence of valvular lesions and may occur in perfectly healthy hearts, especially under the influence of excitement and exertion. Such accidental murmurs are always systolic in time. The most frequent are as follows:

(*a*) Those heard at the apex on excitement, especially when recumbent.

(*b*) Those heard over the second and third left interspaces during expiration, disappearing during forced inspiration. These are particularly common in men with flexible chests, who can produce extreme forced expiration and under such circumstances may be associated with definite thrill.

(*c*) Systolic accentuation of the respiratory murmur, especially on inspiration, heard near the apex or over the back.

None of the above shall be considered disqualifying for active service.

Other systolic murmurs unassociated with enlargement of

the heart, alteration of the first sound, accentuation of the pulmonic second sound, or abnormal response to exercise may also be considered as without significance but should be noted.

Loud systolic murmurs, audible at the apex and in the left back, if associated with any enlargement of the heart, with snapping first sound, or accentuation of the pulmonic second sound, shall be cause for rejection. If unassociated with these other signs and the response to exercise be normal the recruit may be accepted for special service (3).

Systolic murmurs at the base, except as specified above, especially those heard in the second right intercostal space, require more careful scrutiny. They may be due to disease of the aortic valves. In this case they should be harsh, conveyed well into the neck, associated with an aortic diastolic murmur, with thrill, or with a marked enfeeblement of the aortic second sound. Any of these combinations shall disqualify. They are more often due to dilatation of the aorta, either syphilitic or arteriosclerotic. The other signs of dilatation should then be sought—increased dulness in the first and second interspaces to either side of the manubrium, pulsation in this area, accentuation of the aortic second sound. In doubtful cases roentgen-ray examination and Wassermann test should be obtained. Where a slight systolic murmur in this situation is the only abnormal sign and the response to exercise normal, giving rise neither to breathlessness nor thoracic pain or distress, it shall not disqualify. Proved dilatation of the aortic arch, or syphilis of the aorta, shall be cause for rejection for active service, but, if without symptoms, shall not disqualify for special service (3). It shall be noted on the record. Systolic murmurs heard over the second and third left interspaces are almost always accidental and insignificant. When loud and harsh, heard over the upper left chest, front and back, or associated with thrill during quiet breathing, they may indicate congenital cardiac disease and shall disqualify.

All diastolic murmurs, at apex or base, including presystolic murmurs, shall be considered evidence of valvular disease and cause for rejection. The secondary signs should be sought for, viz., enlargement of one or both sides of the heart, alteration of the first or second sound, particularly a snapping first sound and accentuated pulmonic second sound in mitral disease, and the characteristic pulse of aortic insufficiency. In doubtful cases a definite history of rheumatic fever may be given weight. The exact diagnosis should be noted on the record.

3. *Aneurism and Dilatation of the Aortic Arch.*—Aneurism wherever situated, shall disqualify.

Aneurism of the thoracic aorta, unless large or placed near the anterior thoracic wall or giving rise to pressure symptoms, is difficult of detection. Simple dilatation of the aortic arch is a diagnosis which can rarely be made positively from physical signs alone. Therefore, when pulsation above the base of the heart, diastolic shock, well-marked dulness laterally to the manubrium, with a ringing second sound or a systolic or diastolic murmur over the dull area, or tracheal tug, inequality of the pupils, difference in the two radial pulses, alteration of the voice, or suspicious symptoms suggest the existence of aneurism or dilatation, roentgen-ray examination and Wassermann test should be obtained. Any considerable dilatation of the aorta shall disqualify. Slight dilatation with a positive Wassermann reaction shall also disqualify. Slight dilatation with a negative Wassermann reaction shall not disqualify, if it be the only impairment and unassociated with symptoms and abnormal response to exercise. Precordial or other anginal pain, which the examiner is convinced is real, may occur without dyspnea and is significant.

4. *Disturbances of Rate and Rhythm.*—A persistent rate of 100 or over, when recumbent, should suggest the search for exophthalmic goiter, tuberculosis, or other infection, which would constitute cause for rejection. Persistent rapid

heart action, in the absence of proof of these, and unassociated with enlargement of the heart may require study in hospital to determine its significance. A constant rate of 100 or more should disqualify. Temporary tachycardia on excitement is common. If extreme, the decision as to its significance must depend on other findings, especially on the response to exercise. A reliable history of attacks of severe tachycardia in the past, with any breathlessness on exertion, should be reported to the camp surgeon with request for watching of the recruit during his training.

A persistent rate of 50 or under suggests heart block and this should be excluded by tracings. Heart block shall disqualify. Slow rate with normal rhythm and normal response to exercise shall not disqualify. Complete irregularity of the pulse indicates auricular fibrillation and shall disqualify. It is not compatible with normal response to exercise.

Occasional dropped or premature beats, if the heart be of normal size and the response to exercise normal, are of no significance. Very frequent dropped or premature beats require reëxamination to determine if they are temporary. When persistent, but the only impairment, they should be reported to the camp surgeon with request for watching of the recruit during his training.

The irregularity which consists in a quickening of the rate during inspiration and slowing during expiration is common in the young and is of no significance. It may be recognized most easily with the subject recumbent and breathing deeply.

Malnutrition.—Anemia and malnutrition of all systemic diseases most frequently concern the school inspector. Pallor is not always a sure sign of anemia, and a blood examination is sometimes needed to confirm the diagnosis.

Malnutrition may be suspected where a child is pale and too weak to properly work and study, but the number of cases in the schools is much overexaggerated. The author believes true malnutrition exists in less than 5 per cent of

school population. Various cities furnish reports varying from 0.5 to 25 per cent of the children examined. Where it is due to lack of food, it is not always poverty, being often caused by one or more of numerous home conditions. This is more of a sociological than a medical question, and can best be solved by the nurse or social visitor going to the

FIG. 71.—A typical underfed family; source of malnutrition cases.

homes, where tact and diplomacy may reveal the cause and suggest a remedy. Some of the causes are poverty; late hours with loss of sleep; work after school hours, especially at night; sleeping in an unventilated room and ignorance as to the kind of food suited for a school child. Most of these causes can be readily remedied. Poverty should be

referred to one of the charities, and if late work at night is due to need of additional income, this also belongs to the charities.

FIG. 72.—A nurse's home visit revealing poverty and unhealthful conditions.

Nutrition.—No subject in the group of health supervision has received more popular attention than nutrition. Many important investigations in the past decade has been made on food and feeding of school children. Many thousands have been weighed and measured, systems and scales devised, methods of procedure advocated and special classes formed. An endeavor to make all children of a certain age, measure and weigh the same seems to be an obsession with those in school authority. One must concede that age, height and weight are correlated with bodily structure and function, but to try to make all children of the same age measure and

weigh alike is as absurd as trying to make a one year Boston terrier measure and weigh the same as a one year St. Bernard. Tall and small men, fat and thin men are not always mistakes either of birth or environment.

It is true that some children whether from parental neglect or ignorance or childish disregard fail to get the proper food and feeding. The problem is how to recognize the cases needing our attention and how to proceed to lessen the evil. Nutrition, fresh-air classes, furnishing air and a glass of milk is only a makeshift. Weighing and measuring may detect the marked cases of malnutrition, but it brings over the line those who by nature will remain among the lean even though fed beyond capacity. Any trained medical eye can choose from a class those who are truly anemic and in need of medical attention, without carrying a pair of scales. Until we have accurate standards, easily applied, it is practical for a medical officer with his many duties to use common sense added to his broad knowledge of medicine, physiology hygiene and humanology. He must keep in mind ancestry, parents, nativity, race and the seeming health of the child as well as the past health record.

Insurance companies will accept 25 per cent underweight but will refuse an excessive overweight. Hit or miss choosing of applicants for nutrition classes after weighing and measuring is wrong. The afterpestering of parents and children is working in many cases inestimable harm and many could remark "save us from our friends."

MacKenzies-Dunfermline Nutrition Scale classifies as (1) excellent; (2) good; (3) poor, requiring supervision; (4) bad, requiring medical treatment.

It requires a practical comprehensive understanding to classify the individual findings. Note the general appearance, the condition of the skin, muscular tone, color of mucous membranes, facial expression, listlessness, carriage, voice, activity of body and mind. The medical officer should be guided by observations made on several occasions. Do

not forget that underweight may reflect malassimilation more than lack of nourishment.

Nutrition is a complex subject and food and feeding are but factors entering into it. Assimilation is more important. Associated pathological conditions, defects, manner of living and social habits are questions for consideration. The past five years has developed a mania for weighing, measuring and collecting standards and statistics. They have their value but if some of the time and effort as well as money expended would be sowed with seeds of health and nutrition lessons for all, they would reap greater benefits.

TABLE XXIV.—WEIGHT OF CHILDREN ACCORDING TO HEIGHTS AND AGES.[1]

Age.	Weight in pounds.		Height in inches.	
	Male.	Female.	Male.	Female.
At birth	7.5	7.1	20.6	20.5
6 months	17.8	16.0	26.5	25.8
1 year	21.2	20.8	29.3	28.7
2 years	27.5	26.6	33.5	33.5
3 "	32.1	30.7	37.1	36.3
4 "	36.0	35.0	38.0	38.0
5 "	41.2	39.8	41.7	41.4
6 "	45.1	43.8	44.1	43.6
7 "	49.5	48.0	46.2	45.9
8 "	54.5	52.9	48.2	48.0
9 "	60.0	57.5	50.1	49.6
10 "	66.6	64.1	52.2	51.8
11 "	72.4	70.3	54.0	53.8
12 "	79.8	81.4	55.8	57.1
13 "	88.3	91.2	58.2	58.7
14 "	99.3	100.3	61.0	60.3
15 "	110.8	108.4	63.0	61.4
16 "	123.7	115.0	65.6	61.7

Von Pirquet's method of measuring and weighing children originated during the war. Pirquet investigated in Austria for the American Relief Committee and accepted 15 per cent underweight as the criterion for special feeding. This was tested and approved. Procedure was after a method devised by Pirquet known as sitting posture; "multiply weight in kilos by 10, take the product and divide by sitting height in

[1] Compiled by the Children's Bureau, Washington, D. C.

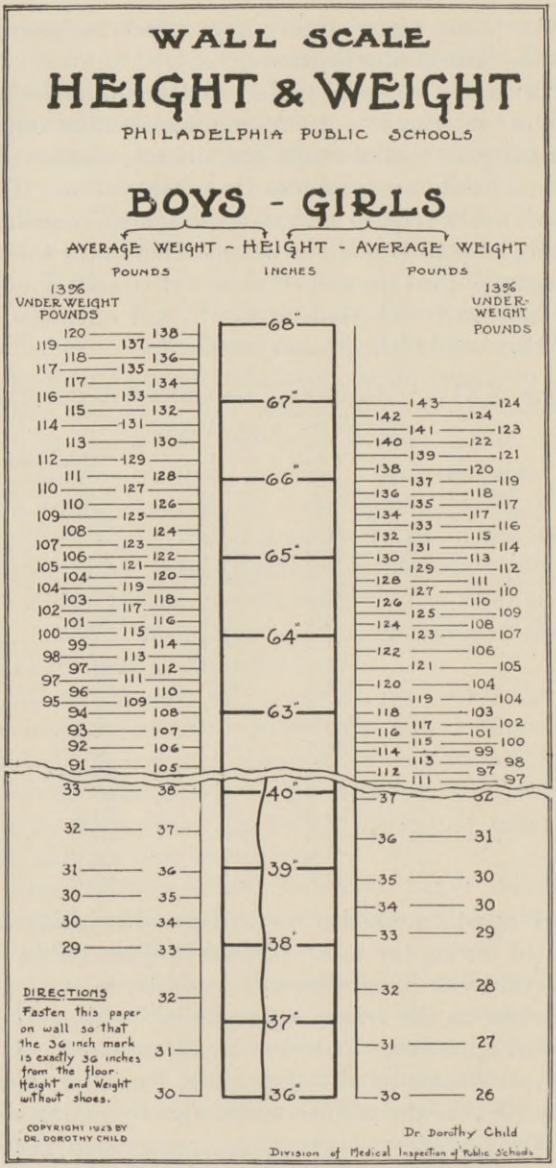


FIG. 73.—Wall scale of weights and measurements.

centimeters." This gives the "nutrition index" which is 1.00 in a normal child.

Dr. Dorothy Child, of Philadelphia, devised a cardboard wall-scale of weights and measurements which is here reproduced. (Fig. 73). It is practical and useful in a class-room.

Nutrition classes which meet at stated intervals to learn about food and feeding is a valuable adjunct to a school curriculum which should teach practical hygiene and healthful living.

Of what use is education without health is a motto for everyone. Everything which makes for healthful education should be fostered and encouraged. We must be alert that some large commercial enterprise does not use our hysteria on health problems to further their interests. The easiest avenue to try out anything and use its time and services is a school system.

School Lunches.—The supplying of lunches, consisting of soup, crackers, rolls and pudding to the school children for a few pennies, has received considerable impetus in America. The success or failure of this undertaking depends altogether on the purpose for which it is intended. If these lunches represent an effort to conserve the health of children and discourage the purchase of impure and unclean candy and pretzels, peddled around the school, they are a success and a great benefit; but as an aid to poor families, they are a failure, because the school children of very poor families are not given pennies to spend at school. Should they be given these lunches free, the nourishment supplied would not be sufficient for the twenty-four intervening hours until the next lunch, and from Friday until Monday. Where poverty exists sufficient to admit of improper nourishment of the children, it becomes a problem for the organized charities and not a makeshift for the schools.

Lunches of milk, eggs and crackers supplied free to the children attending special classes is of great value, and becomes part of the curriculum of these classes. The nour-

ishment together with periods of rest and plenty of fresh air are the things which aid in improving the child's general health. This use of school lunches is to be highly commended.

Sex Hygiene.—In public elementary schools the medical examiner is but rarely called upon to diagnosticate any of the acquired venereal diseases. Sometimes a teacher may observe a child continually rubbing around the genital organs and seek an opinion of the medical officer. Thus he is occasionally asked to decide if a child masturbates, and if so what action should be taken. A tactful questioning of such a child often evokes an answer of itching or discomfort of these parts. Lack of cleanliness, possibly the most frequent cause, and abnormalities, such as adherent prepuce, are occasionally found.

The problem of the advisability of teaching sex hygiene and what to teach is one of the most difficult to answer to the satisfaction of the two factions who are in favor or against. The easiest way for an author to avoid the critics is to claim "Space does not permit."

The author has spent many hours in discussing the problem with educators and physicians. Sentiment seems to be against teaching this subject. Those who advocate in favor when asked what to teach, fail to have any ideas or their answer is so indefinite as to furnish no thoughts for a constructive working plan. The following thoughts are offered in hope of aiding some one in the furnishing of a detailed practical plan to benefit the coming generation.

The social evil is no nearer a solution today than in the days of our grandfathers. Sex hygiene means efforts to promote those conditions of living, environment and personal conduct which may best protect the family as a social institution and secure to the individuals of each generation a clean rational sex life.

Whenever sex talks are given, it should be by male school physicians to the boys and women physicians to the girls. The use of facts about plant life, propogation and Nature's

similar endeavors throughout animal life may be serviceable if tactfully handled. The beauty and grandeur of life should be taught. The difference between wild uncultivated flowers and plants and the carefully watched and cultivated ones should be emphasized and references to our lives. There is plenty of opportunity for a teacher to use her ingenuity.

Those not acquainted with schools and teaching cannot realize the difficulties due to the strange workings of the minds of some children. A parent, minister or physician may say things which a teacher would fear to attempt. The ideal place to teach the hygiene relating to sex is the home and in accordance to the needs of the individual child and the belief of the parents as to its requirements. The school may find a place in such services. It may be good judgment to invite the parents to talks on the subject and leave them carry the message or a part of it to their offspring. Children have keen imaginations and may carry home stories of things unsaid rather than said and in a distorted manner as to give offence to the parents. Many an instructor has been accused of wrong doing or teachings when his conscience made him bold enough to teach and a child's imagination carried the thought over the line of safety.

Knowledge of a subject does not necessarily supply moral stamina. The school should endeavor to improve the moral characters, teach boys and girls purity and cleanliness of thought and body, obedience and respect for laws whether Nature- or man-made. The school should guide the child in the kind of literature to read and what to avoid. Good books of a light and interesting character which appeal to children should be available at school and loaned to take home. Girls should be taught reserve, modesty of manner and dress.

The parents more often sidestep teaching sex problems because they do not know what and how to teach. The schools should teach the parent and leave the rest to them.

Ignorance may be bliss, but with a lack of some knowledge

of sex problems, ignorance may end abruptly with some misinformation and be replaced by a calamity. Equally trite and true is "A little knowledge is a dangerous thing." All we could impart to a child is a little knowledge and then permit his imagination to possibly run riot. There are many who believe sex problems are purely parental and even there requiring tact, diplomacy and delicate handling. Success is met by having the respect of the child as well as its confidence. There must be some assurance that the child will come to its home first for information. Children must have faith and confidence in the parents.

TABLE XXV.—INDIVIDUALS GIVING ADVICE OR INSTRUCTION IN SOCIAL HYGIENE AND SEX EDUCATION, 70 CITIES REPORTING.

Given by.	Number of cities.	Percentage.
Physical training teacher	15	21.4
School nurse	13	18.6
School physician	13	18.6
Biology teacher	7	10.0
Teachers	6	8.6
Principal	5	7.2
Social advisers	5	7.2
Dean	3	4.3
Superintendent	2	2.6
Household arts teachers	1	1.4
Total	70	99.9

Teaching Hygiene.—The duties of the medical officer in the school-room includes the prevention as well as the diagnosis of disease. He should take every opportunity to teach healthful living at home and school and should impress the pupils with the need of cleanliness of body, mind and clothing. Method of dress in its relation to health should receive his attention, and he should condemn the wearing of corsets, tight clothing, tight garters, and heavy clothing suspended from the waist instead of the shoulders. His instructions should supplement the teacher's course in practical hygiene. Where nurses and social visitors are employed, they should

observe on their home visits any infractions from the laws of health and try to have them corrected. This is important

FIG. 74.—Health poster made by a school child.

because uncorrected faulty home conditions tend to nullify the teachings and efforts at school. Medical inspector, nurse and social visitor should acquaint themselves with

the laws of their State and city pertaining to housing conditions and what constitutes a nuisance, and any insanitary conditions of the dwellings or streets should be reported to the proper health authorities for their action.

The teaching of personal hygiene should be an important branch in the curriculum of all grades, and should include cleanliness, clothing, diet, exercise, proper rest of both body and mind, and a strict observance of all rules for good health.

The success and results obtained in teaching hygiene is directly in proportion to the curriculum and the efficiency of the teacher. Good interesting text-books are needed. With prohibition existing, it is useless devoting time to the ill-effects of alcohol. The subjects must be live ones and offered in an interesting manner to appeal and impress. The ingenuity of a teacher is unlimited to devise means of teaching important phases of hygiene. The best results are obtained not by study or memorizing a lesson, but have the children do something. Always picture the beautiful side of health, not the don'ts and dangers of disease, and vivid pictures of germs chasing the child every minute of its life. The making of a poster, bringing a picture to class, are all impressive and lasting in its effect.

PART V.

THE HEALTH OF THE TEACHERS.

School medical supervision is a fixed unit in most school systems, but it is all for the pupils and rarely for the teacher. She is supposed to obtain her lessons in personal health automatically by teaching her class mere words on physiology anatomy and so-called hygiene. The health of the teachers is an index of the efficiency of any school system. Long before the end of the term the majority of teachers are on the verge of a nervous breakdown. Most of these cases could be avoided by teaching conservation of energy, and correcting some of the physical defects which the teacher has as well as pupils, but which we endeavor to treat only in the child.

The question of giving a Sabbatical year for rest every ten years is fallacious. The chances are that at the time a teacher is offered a year of rest from school work she may be financially embarrassed, necessitating her taking another position to recuperate her pocketbook rather than her nerves.

The author would suggest a Sabbatical week of rest every three months. The two summer months for vacation are used by many teachers in working to earn enough to live on during that period. A week's vacation does not permit such procedure.

Correspondence with many insurance companies and a study of the records of busy physicians shows some interesting data on the health of teachers. Insurance companies con-

sider them the best risk. They have a death rate of 3.6 per thousand, and their longevity is above most other professions and trades.

For the most reliable statistics on morbidity I am indebted to the Metropolitan Life Insurance Company.

TABLE XXVI.—PHYSICAL DISABILITY RATES PER 1000 TEACHERS EXPOSED, CLASSIFIED BY SEX AND BY AGE PERIOD.

Age period.	Men teachers.			Women teachers.		
	Number exposed.	Cases of disability.	Rate per 1000.	Number exposed.	Cases of disability.	Rate per 1000.
All ages: (Inc. leaves of absence)	2611	231	88.5	18,096	3646	201.5
(Exc. leaves of absence)	2611	220	84.3	18,096	3483	192.5
15 to 19	..	..	..	16	3	187.5
20 to 24	166	13	78.3	3,353	425	126.8
25 to 34	1075	88	81.9	7,328	1288	175.8
35 to 44	827	57	68.9	4,656	975	209.4
45 to 54	369	40	108.4	2,087	550	263.5
55 to 64	146	15	102.7	602	174	289.0
65 to 69	22	4	181.8	50	14	280.0
70 and over	6	2	333.3	4		
Not stated	..	1	..	..	54	
Leaves of absence	..	11	..	..	163	

TABLE XXVII.—DAYS ABSENT PER SCHOOL YEAR PER 100 TEACHERS; CLASSIFIED BY SEX AND BY AGE PERIOD.

Age period.	Days per 100 teachers.	
	Men.	Women.
All ages (excl. leaves of absence)	134.0	310.5
15 to 19	..	143.8
20 to 24	125.3	161.1
25 to 34	117.6	287.4
35 to 44	130.6	323.2
45 to 54	169.9	479.8
55 to 64	156.2	511.6
65 to 69	190.9	980.0
70 and over	166.0	.....

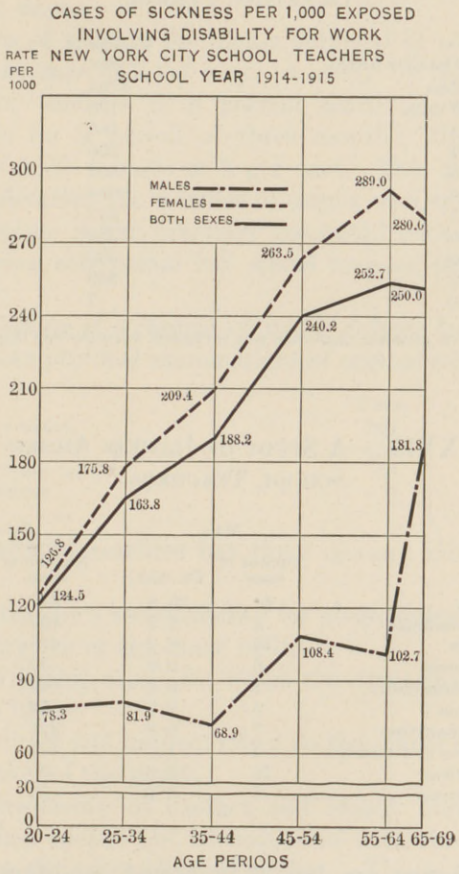

CASES OF SICKNESS PER 1,000 EXPOSED
INVOLVING DISABILITY FOR WORK
NEW YORK CITY SCHOOL TEACHERS
SCHOOL YEAR 1914-1915
RATE PER 1000
MALES
FEMALES
BOTH SEXES
300
270
240
210
180
150
120
90
60
30
0
289.0
280.0
263.5
252.7
250.0
240.2
209.4
188.2
181.8
175.8
163.8
126.8
124.5
108.4
102.7
78.3
81.9
68.9
20-24
25-34
35-44
45-54
55-64
65-69
AGE PERIODS

FIG. 75

TABLE XXVIII.—CASES OF DISABILITY CLASSIFIED BY DURATION PERIOD.

Duration period.	Number of cases.[1]	Total, per cent.
All durations	3703	100.0
Under 3 days	170	4.6
3 "	185	5.0
4 "	266	7.2
5 "	627	16.9
6 to 10 "	1033	27.9
11 to 15 "	417	11.3
16 to 20 "	259	7.0
21 to 40 "	380	10.3
41 to 120 "	359	9.7
121 to 180 "	7	0.2

[1] 174 leave of absence cases are not included because the duration period is unknown.

TABLE XXIX.—A STUDY OF ILLNESS AMONG 20,421 SCHOOL TEACHERS.

	Male.		Female.	
	Number of cases.	Per cent.	Number of cases.	Per cent.
Influenza	48	20.8	739	20.3
Acute bronchitis	4	1.7	100	2.7
Tonsillitis	19	8.2	478	13.1
Tuberculosis	6	2.6	32	0.9
Chronic bronchitis	1	0.4	149	4.1
Pneumonia	5	2.2	54	1.5
Nerve exhaustion	7	3.0	321	8.8
Neuralgias and neuritis	4	1.7	141	4.0
Rheumatism	10	4.3	90	2.5
Heart disease	7	3.0	58	1.6

These figures are less than actual conditions as they account only for illness of three or more days, and not for a single day, and those who remain at work though ill. School days only were counted and duplications of individuals for same illness were omitted. Male teachers were absent an average of one and three-tenth days; female absence was three and one-tenth days.

The average period of disability was fourteen days.

The average period of absence for nervous breakdown was thirty days.

Statistics of absence for illness gathered in several cities shows an average of 2 per cent. A study by the author of prospective teachers in a normal school showed among 850 pupils for a period of three months, illness caused absence of 1350 sessions or 3 per cent. This did not take into consideration the number of pupils who spent part or all of a session in the infirmary connected with the school. Seven during this period left school because incapacitated physically.

The following is a résumé of major defects found among 800 complete physical examinations of normal school pupils.

	Cases.	Per cent.
Defective vision	100	12.5
Carious teeth	178	22.2
Hypertrophic tonsils	12	1.5
Heart disease	8	1.0

The health of teachers has three distinct sides for consideration.

1. The teacher's responsibility for absence due to lack of personal hygiene or ignorance of it.

2. Contributing causes for which the educational authorities are to blame.

3. The direct and indirect effect on the school system and the education of the pupils.

Those frequently in contact and closely observing the work in class cannot but be impressed with the apathy of teachers for their own physical welfare. This indifference is responsible for the authorities caring less about the teachers' welfare. Teachers are not physically overworked but the burdens of mental strain with little exercise causes nervous exhaustion and kindred ills. The educational authorities often unnecessarily burden the teachers with clerical work which nets little but useless statistics. In some cases there

is more clerical work than teaching. Teachers add to this burden by giving much home work necessitating after-hours in marking papers.

The educational authorities who do not offer to teachers the best sanitary conditions in which to work are losing much. Poor ventilation of class-rooms, bad lighting, overcrowded class-rooms, inadequate lunch and rest-rooms, an urging of postgraduate work after school hours are a few conditions which need remedying. Large corporations and department stores are drawing many women from the ranks of teaching by offering better surroundings to work.

Lunch hour for teachers is a vague period. In many cases they sit at their desks munching an apple or a sandwich while marking papers. No proper place being furnished for this short period of rest and feeding. A school should offer a hot lunch at a moderate cost.

Overcrowded class-rooms is an evil which is acute because the authorities have not kept pace in building with the increase of population. Factories, offices, churches, industries and stores and not schools are generally the places of interest in cities because they are modern and progressed with the times.

Systems of teaching are faulty, due to lack of training of teachers and inadequate supervision which permits a teacher to endeavor to make every pupil a genius. Energy could be conserved by permitting the precocious and normal pupils to use their own initiative, while more time could be devoted to the slowly reacting ones. The brainless pupil who will not acquire any education clogs the system and wears out the teacher who endeavors to bring him to the level of others. He belongs in a special small class.

Teachers are human and subject to all the ills which flesh is heir to, but in particular to nerve exhaustion. Her profession predisposes to it, but much alleviation can be had by her observance of common rules of personal hygiene. Exercise does not mean walking up and down the aisles

several hundred times a session. Relaxed muscles and mind while walking in the open is needed. Shouting at disorderly or seemingly ignorant pupils does not exercise even the teacher's voice and is bad pedagogy. Time and effort spent in fretting over inability to put across a lesson should be utilized in quiet scheming of how to teach.

Supervisors who are unnecessarily hypercritical and lack diplomacy should not be the means of unnerving a teacher for several days following a visit. The teacher should not waste energy criticising her superior officers and the superintendent. Managing a big educational institution is a real job, and of course outsiders, including teachers, frequently know more about how the work should be conducted. Think about it but do not talk about it. Unruly, disobedient children existed since the time of creation. Excess of discipline and restraint widens the gap between pupil and teacher. Frequently class censure of a pupil makes a hero of him and all boys like to be heros, therefore repeating the act. There is no fun to tickle one who will not giggle. The best way to discipline some boys is to discipline yourself.

Teachers may worry over inability to carry on the entire schedule required in the allotted time. Teachers who teach by schedule and the clock never get anything across but their nerves. Schedules are mere guides, so save the worry.

The nervous teacher reacts on her pupils and lessens the efficiency of her work. When in this abnormal state she should exercise self-control. Remember the child may have some nerves. A smiling, cheerful disposition even with odds against you is a good tonic to the nervous system. Family and financial troubles should not be carried to the class-room. Contentment is a valuable asset.

The failure of a teacher to be human and respect the feelings of a child is often the cause of unhappy, unwilling pupils, and in some cases a nervous child difficult to teach.

It seems unnecessary to call attention to the need of a required amount of restful sleep for teachers. To assure

this requires no mental work or reading for two hours before retiring. If indigestion or headaches affect a teacher, there is ample cause which should be corrected. It is not necessary to be always mindful of possible symptoms and defects to use them as danger signs. One who knows he has a stomach and how it is functioning is a pest. Do not visualize your internal organs. When things are right and we can observe the sun shining we have no indigestion.

There are about 10 per cent of teachers who have defective vision uncorrected or an improper correction. This is a frequent source of nervousness and kindred ills.

School inspection by competent physicians should include a thorough physical examination of all applicants for teaching and eliminate those who have irremediable defects of vision, hearing, and marked orthopedic deformities.

BIBLIOGRAPHY.

Commission on Welfare of Teachers: Health of Teachers, Commission of New York State Teachers' Association, 1916.

Hart, J. Y.: Health of School Teachers, Lancet, 1922, **202**, 702.

New York City Commission on Pensions: Report on the Pension Funds of the City of New York, 1916, Part II, pp. 94.

Olrich, Mabel S.: Health and the Rural Teacher, Survey, February, 1921, pp. 727.

Terman, L. M.: Teacher's Health: A Study in the Hygiene of an Occupation, Boston, Houghton Mifflin Co., 1913.

Wager, Ralph E.: Health of the School Teacher, Journal of Industrial Hygiene, 1920, **2**, 197–205.

Harris, L. I.: Teachers' Minimum Health Standards in Schools, Scientific Methods of Health Bookkeeping Serve to Disclose Health Hazards, Nation's Health, 1921, **3**, 477.

Dublin, Louis I.: Physical Disability of New York School Teachers' Statistical Bureau, May 10, 1923.

PART VI.

MENTALITY.

CONSIDERABLE interest has been shown in the past five years in grading children in the public schools according to their mental status. The child who was found to be below the normal average has been singled out and studied for the purpose of adopting some method of educating him with the least amount of interference with school-work and at the same time to obtain the best results for the individual child.

The precocious or supernormal child is also of interest to study, as such children are often responsible for the setting of too high a standard for educating the average child. The precocious child, naturally of a nervous temperament, is pushed forward too fast to the detriment of its physical health.

Classification.—The retarded subnormal and mentally defective child for practical purposes may be classified into the following groups:

1. Retarded in one or two subjects.
2. Subnormal, or a child who is mentally behind the average child of the same age. These may also be termed "backward" or "dull" pupils.
3. Mentally deficient or those who are so far behind average children of the same age as to be unable to acquire an education through the usual channels.
4. Feeble-minded or those whose mental faculties are absent.

5. Idiot or imbecile, which includes those with no mentality that have associated paroxysms of nervous phenomena making them unsafe to themselves and others.

There are no sharp lines of demarcation between these various classes, and they coalesce, making the defect one of degree only. The idiot or imbecile cannot be made safe enough to place in society or school, and is purely an institutional case. Every State should have sufficient institutional room to care for this class and prevent as much as possible their further propagation.

The feeble-minded through inherited defects of the brain should be classed with the imbecile and placed in suitable institutions where attempts may be made to give some education that may aid the unfortunate in eking out an existence.

Those feeble-minded from an acquired physical defect should be placed in institutions where they will receive medical care that may correct the defects and special training which may later improve the mental faculties sufficient to enable the child to again be placed with its family. These cases rarely take their place in society. It has been stated that of the inmates of an asylum for feeble-minded, 25 per cent could be made useful men and women by correction of physical defects.

The feeble-minded child even though you succeed in training him after hard weary efforts to some parrot talk or some inconsequential acts, he is still feeble-minded. He is unable to take care of himself in the world, and usually unable to earn his own living, even under direction. He is often a pervert with criminal tendencies, and without close supervision, a menace to himself and the public.

The most rational words on this subject are those of Dr. E. R. Johnstone:—

"In this connection one is tempted to stop and ask, What is there about reading, and writing, and numbers that has made the whole civilized world go so madly after them?

What is it that has made us all feel that everybody should be able to read, and write, and count? Is it a real necessity, or is it only a fad of the time or of the century? May not one become just as moral a person without any of these attainments? May he not work as honestly and as faithfully at whatever he has learned to do and earn his living and contribute to the world's welfare, as well without any of these attainments? If one is inclined to answer this in the negative, let him turn to his ancestors and see how far back he must go in order to find most important personages in the community, who could not sign their names or read the names when written; who could not count more than their fingers. The greatest civilization, in some respects, that the world has ever seen was made up of people who had no names for numbers higher than 10,000. It is not difficult to pick out from history many names of people who could do none of these things.

"No one can deny that history is full of examples of people who have been great benefactors of their race that had little or no attainments in this direction. This being the fact, why is it that we persist in drilling feeble-minded children upon these things. We say that we want to prepare them for a place in the world, to earn their own living, and that in order to compete in the struggle for existence they must be able to do these things. They cannot get as good a position if they cannot read and write. True, but if they cannot learn to read and write, what then? We have ignored entirely the fact that we are not accomplishing what we attempted to do and that the children who had been thus trained went out into the world, and still failed to accomplish that which we expected. By not teaching them these subjects we are not depriving them of any rights, we are not condemning them to a life of uselessness. We are simply declining to harass them with those things that they cannot comprehend. We are saving the time which would be spent upon these things in order to devote it to something that is useful,

something that does make them happy, and something that does enable them to do something toward their own support, even if they are not fully capable of taking care of themselves.

"I should maintain that this holds not only for those children who are in institutions for the feeble-minded, but also almost as fully for the children in the special (ungraded) classes or in the Hilfsschulen.

"If then we banish book work from these classes, 'What shall we do?' The answer is clear: if we cannot train through the eye used upon the printed page, or through the ear, we can train through the hand, and training children *to do things* is vastly easier and vastly simpler than training them *to read about things.*

"We come then to the positive side of the argument. The one thing that fits all of these children, the one thing that draws out whatever is to be drawn out of them, is training of the hand, manual training, industrial training, these things such children can do with wonderful success. In this they are interested; this they do with great joy; it arouses in them a feeling of satisfaction at accomplishing something. Every one knows this, because all institutions and all special classes and Hilfsschulen devote some time to this sort of work. The only reason that more of it is not done is, I believe, because the persons in authority look upon this as a play, and not as mental development, not realizing that for this class of children it is the only thing that means mental development.

"As we have argued, the child may learn a great many things by rote without ever thinking about them at all. He cannot do things with his hands without thinking about what he is doing, at least until he has done it so often that it becomes automatic.

"We have, in this manual work, material for development which fits all grades. The low grade does the simplest things, the middle grade can be taught to do more complex work,

while our highest grade finds here scope for all his faculties and abilities. He can use all the thought and intelligence and judgment that he can command, and always his work is ahead of him and leading him on. He works with interest and with joy, and leads a life as useful as it is possible for his defective brain to carry on.

"I have had in mind, in the argument so far, the idea that these children were to go forth from the institutions or the special classes and attempt to earn their living in the world. I have done this because I suppose, for many years, this will be practised.

"I do not want to close, however, without entering a strong protest against this policy, and urging strongly that the only rational thing for society to do is to colonize these people and to care for them for life in institutions where they will be happy and as useful as it is possible for them to be. The crime of the age, from the social standpoint, is to turn these children loose in the world when they are fourteen years of age, as is done in Germany, in England, and in the United States to a very large extent. We have now some institutions that keep these children for life. Many think that this is a large undertaking and practically impossible, but we must not forget that these people have to be taken care of somehow. They are in the world and must be cared for until they pass out."

In a study of subnormal, dull and retarded pupils we should consider the causes, the method of diagnosis and treatment of these various defectives.

Prevalence of Retardation.—The number of mental defectives average about 2 to every 1000 of the population. The number of subnormal children in the public schools varies with the method of examination, the examiner, and the standards adopted in determining the defects. The report of the Committee on Special Education of the Philadelphia Teachers' Association showed the existence of 11,543 subnormal children, which was slightly in excess of the number

of children who were two or more years in grade for the year ending June 30, 1908. The number allotted as institutional cases of feeble-minded was 442, and approximated the number three or more years in grade 483. Of a total of 881 children enrolled in the special schools, 51 were found to be feeble-minded, institutional cases; 538 properly belonged to special schools, including incorrigibles and truants; 213 were backward and could be taught by special instruction.

Causes of Retardation.—Causes of retardation and the subnormal child may be grouped as follows:

1. Physical defects.
2. Home surroundings and environments, causing chiefly incorrigibles and truants.
3. Faulty educational method and inexperienced teachers.

We must not accept as conclusive evidence of deficiency every child labeled defective by a teacher. When a teacher asserts that many of her pupils are dull and defective, the first thing to observe is the teacher herself and her methods. All children are not equally intellectual, and a fair average must determine the normal standard. One precocious child in a class is apt to increase the teacher's standard, and it is inadvisable to use all the available faculty and nerve force of such a child by frequently advancing it a grade. It is far better to devote less time and teaching effort to such a case and more to the less advanced child. The precocious child is often one who is receiving care and teaching at home.

An educational system must be elastic enough to reach both the mental capacity of the slowly progressing but normal child and the precocious one. The teacher should study the best methods of imparting knowledge to each child as an individual, and subjects should be outlined to meet the capacity of the average.

Home Surroundings and Environments.—This is a most important causative factor. In suspected cases of mental

deficiency or backwardness, the physician, nurse, or teacher should visit the home and intimately study home conditions. Work after school hours and at night, late hours with loss of sleep, poverty with insufficient nourishment, worries or great responsibility, are some of the many conditions which may be revealed. Where parents lack control over a child and there is added the influence of morally bad associates, there exist two influences that will produce the truant and incorrigible child. These children belong in a class of their own and the solution is the "Parental School." Before disposing of the truant or incorrigible, a thorough physical examination should be made and any physical defects found should be corrected. One can readily understand how a child with some defect, such as bad vision, unable to cope with the school problem, willingly drifts into this class.

The public school is no place to attempt to train a mentally defective child, and it is no credit to an educational system that, by special instruction, succeeds in teaching it, after three years' daily training, to place pegs in holes in a board. Such a child never becomes a suitable person for society. The object of the school is to fit a child for society and citizenship.

Physical defects causing retardation and subnormal children are malnutrition, exhaustion and fatigue due to poverty or some systemic disease; fatigue due to some home conditions, as late hours, the use of alcohol, drugs, or tobacco; toxemias, such as constipation in children, which may produce an auto-intoxication, headaches, loss of sleep and nervousness unfitting the child for study; rheumatism and uric acid diathesis which may cause nervous, ill-tempered children. Syphilis and its effects, especially on the nervous system and mentality, is a more frequent cause than is credited. Other physical defects are diseases of the nervous system, including epilepsy, chorea, and the minor degrees of nerve unbalance termed "nervousness." Many of these cases are secondary or symptomatic of other defects, such

as eye, ear, nose and throat trouble. The nervousness in these cases is chiefly a reflex symptom.

Defective hearing and some of the nose and throat defects, such as adenoids and enlarged tonsils, may cause retardation, especially when the general nutrition and health of the child is impaired.

Defective vision, hearing and speech are probably the most important physical defects in relation to retardation. A child who does not hear well or who cannot see properly cannot receive correct impressions on its mental apparatus, and therefore must be below the standard of normal children.

The following case found in one of the public schools illustrates the effect of defective hearing:

A girl, aged fourteen years, two years in the second grade, and three or four years in the first grade, was promoted to second grade only because the teacher was ashamed to keep her any longer. This child was found on examination to be almost entirely deaf, and also to have a defective speech. She deceived the teachers, as well as possibly the parents, by guessing at everything said to her, using the movements of the lips as a guide. This child on examination was found to have a bony growth as well as adenoids entirely covering and obliterating the Eustachian tubes. This was the cause of both defects, and after operation the child greatly improved mentally.

The following is an example of defective vision:

Mary D., aged eleven years; nationality, Italian; in this country two years; in first grade sixteen months. Sent by teacher with this note: "This child cannot talk; apparently dumb, as it makes signs and motions for everything it wants to say, and in answer to all questions." I asked the child: "What is your name?" "Mary," she answered, in an indistinct whisper. "How old are you?" and several other questions, elicited nothing but nods of the head and shrugging of the shoulders. The entire time while being questioned her face was set in a silly grin, and she nervously

took hold of my coat, systematically played with each button, as though counting. As she had a very marked squint I believe her eyes were one of the offending members. She seemed to know no letters, or figures, and was unable to follow an illiterate test card. I held up two fingers a few feet from her, and asked how many fingers? She answered "four." To three fingers she answered "six." As this was as much as I could get her to answer, I was not prepared to say the child saw double. On being handed some pencils, she made no effort to count them. Thinking possibly the child was unacquainted with our language, I called an Italian boy, and had him speak to her in Italian, and asked her to answer in Italian. This did not succeed, as she answered but one more question, the name of her father. I pointed to her teacher, and asked, "Who is this?" She answered correctly and distinctly, but in a whisper. She accomplished the same in reference to the principal.

I wrote on the board the following, and with the child seated about 15 feet away I asked her to copy. A normal child seated near her was also asked to copy the same, which was done correctly:

The abnormal child made no effort to copy 1, 2, 3, or 4, which were drawn 6 inches high and wide. But figures 5, 6 and 7, which were drawn 3 feet high and wide, were copied as shown in 8, 9 and 10, Fig. 76. The child seemed not to see or draw horizontal lines. This case proved a marked mental deficiency due to defective vision.

Various cities and various countries report proportions of defective vision ranging from 25 per cent to 50 per cent of the school population. The question is. How many of these children with such defects untreated can be considered mentally deficient or subnormal? All are, for a child that cannot see correctly must get wrong impressions and make wrong conclusions. He is usually deficient in writing, reading and spelling. Again, headaches, whether due to an error of refraction or muscular unbalance of the eyes, causes a

languid nervous, and inattentive pupil. Cases have been reported in which are found good vision, no strabismus, no great refractive error, and yet the investigation of the muscular status shows that a latent hyperphoria was sufficient to incapacitate the child. Most of the statistics of investigation of the condition of the eyes of school children are based upon the common practice of allowing the pupils to merely read from a Snellen test card at a set distance. The child may see the smallest letter, and yet it is no sign that the child's vision is normal. The range of accommodation in children is great, and while one may discover the

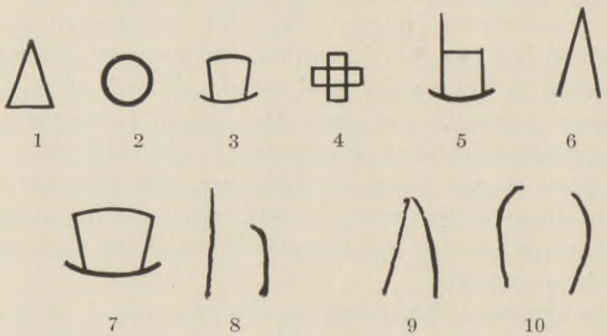


FIG. 76

gross manifest errors, the important latent ones are overlooked. The duty of a physician to every child which is brought to him suffering from constant headaches, nervousness, indisposition and dulness should be thoroughly examined under a mydriatic for both refractive and muscular errors, and these should be immediately corrected. It remains for the medical profession to overcome the widespread ignorance that children should not wear glasses because "by wearing them early the child will always have to wear them," or "we (the parents) never wore glasses." In later life they fall victims to the traveling salesman or

the fake optician, though even these do some good in some cases, in that they correct some of the errors, by supplying glasses. The medical profession stands idly by and encourages this fake oculist work by neglecting to diagnosticate cases of defective vision in children.

Realizing that the only true idea of the subject could be obtained by the use of a mydriatic, and desiring to obtain the worse cases with the most glaring defects, the author requested the teachers to send to him those children whose work was subnormal, due to a possible defective vision. The following statistics of 250 pupils examined under a mydriatic may prove interesting. All of these cases were carefully refracted with the ophthalmoscope and retinoscope. Only 12 ever wore glasses before. All obtained the necessary glasses. Number of cases of strabismus, 27. Of 185 examined for muscle balance, there were 41; hyperopia, 60; myopia, 26; astigmatism, 164; hyperopic astigmatism, 86; myopic astigmatism, 45; mixed astigmatism, 33; astigmatism with the rule, 80; astigmatism against the rule, 67.

Methods and Records of Examinations.—To diagnosticate the presence and degree of mental dulness, the examiner should take a complete history and make a physical and mental examination of the child. The following are the things to be considered:

1. Early physical and mental history from time of birth to present (obtained from parents).
2. Present physical and mental history (obtained from teachers).
3. Mental examination by physician, using Binet's or other similar tests.
4. Physical examination by medical inspector.
5. Examination of eyes, ears, nose and throat by specialists.

The early history of the child may furnish valuable information, and should include some history of the physical and mental status of the parents. Such information as

difficult birth, use of instruments, marasmus, convulsions, syphilis, inability to walk or talk at usual age may be noted.

Too much weight must not be given to the assertion by teacher or parent that a child is feeble-minded, but full cognizance should be given to the school records of its education. The medical examiner should decide the degree of mental dulness, also if an institutional case or one for training in a special class, but only after an exhaustive examination.

In a study of retarded pupils the examiner should observe:

Defects in development, size, form, proportion, asymmetry, and weight of body.

Defects in nerve balance or muscle balance.

Defects in nutrition.

Physical defects.

Defects in development: The examiner should weigh the child and measure its height and compare with normal average for its age. Each part of the body should be scanned for lack of development and asymmetry. The head in particular may show evidences of poor development, and the site of fontanelles, ossification, protuberances, size of skull, and general expression of the child should be noted.

Defects in nerve and muscle balance tell much about the nervous system of the child. The position taken while standing; the extension of the arms in front of the body showing drooping of the hands at the wrists, spreading of the fingers, nervous tremors, and twitching of the fingers, all should receive attention. Likewise, the balance of the body and spinal contour while the arms are extended should be noted. Results should be tried while the arms are extended to the sides. The rapidity or slowness of response to the command to extend the arms indicates the power of mental reception. The command should be first given in words only, then the power of imitation or response from vision tried by showing what is wanted.

The child should stand with feet close together, hands to

the sides, and eyes closed; then any swaying or inability to balance body should be noted.

Defects of nutrition are told by weight, height, color of skin, especially the mucous membranes, and general appearances.

Physical defects are taken up under their various headings, eye, ear, etc.

The recording of investigations of backward or mentally defective children may be done on blanks similar to the following, which was devised by the author and used for such investigations since 1904:

Accurate answers to the following questions are important in the gathering of statistics of value in the treatment of mentally deficient pupils:
Name of pupil.....Address.....
School.....Grade.....How long in grade.....
Age.....Nationality.....Color.....
How long in school.....
This pupil has been considered dull, backward, mentally deficient or below normal.....

The teacher will kindly answer the following questions:
Why do you consider him (her) as such?.....
.....
In what branches deficient?.....
In what branches proficient?.....
Yes or no—Lazy.....No ambition.....Mischievous.....
Nervous.....Inattentive.....Poor memory.....
Bad morals.....Truant.....Violent temper.....
.....
Physical defects noticed by teacher.....
.....
This child has received treatment for.....
Has his mental condition improved since treatment?.....
In what manner?.....
.....
In which branches has he (she) improved?.....
.....

FAMILY HISTORY.—To be obtained from parent or guardian.
Health of parent.....Sisters.....Brothers.....
Education of parent.....Sisters.....Brothers.....
Mental condition of parent.....Sisters.....Brothers.....
Was birth of above pupil with difficult labor?.....
Instruments?.....Any injury since birth?.....
Home conditions: Care.....Culture.....Discipline.....
Language spoken at home?.....
Is child required to work after school hours?.....
.....

REPORT OF PHYSICIAN.

	Abnormality.	Asymmetry.
Nutrition	Trunk	
Weight	Arms	
Height	Legs	
Nervous condition	Hands	
Coördinations	Feet	
Eyes	Cranium	
Vision without mydriatic—	Forehead	
R. E. L. E.	Face	
Vision with mydriatic—	Ears	
R. E. L. E.	Eyes	
Color vision	Nose	
Hearing—	Lips	
R. E. L. E.	Palate	
Throat	Tonsils	
Speech	Teeth	
Orthopedic defects		

DATE TREATMENT RECOMMENDED:

Non-promotion and Mentality.—Numerous methods have been tried to test the intelligence of children and to sift the backward from the normal. Some large cities have prepared a census of their mental defectives and subnormal pupils based on the time in grade; age in grade and non-promotion. This is not a safe method for diagnosticating mental deficiency. In 1909, New York City had 109,440 children who failed to win promotion in the first term, and 100,338 in the second term. There were 156,208 "over age" pupils in the grades and 20,000 "over age" in special classes. Yet it is hardly necessary to say that no one would think of classing this large army of overaged and non-promoted as mental defectives.

The causes of non-promotion or two years in grade are many, and although the child may be, he more often is not a mental defective. When, however, the child is three or more years in one grade he is invariably defective. The non-promoted child should receive careful consideration by the teachers to ascertain the underlying cause, and they should be compelled to ascribe a cause for each case. A careful record should be kept of the branches in which the child fails; those in which he is weakest and those which are performed best. The teacher should grade according to the child's power of application to the work.

Causes of Non-promotion: The following classification of causes of non-promotion may aid both teacher and physician in deciding when non-promotion means mental dulness.

Causes Due to School or Teacher:

1. Faulty curriculum.
2. Lack of success of teacher.
3. Teacher and pupil incompatible.
4. Frequent absence of teacher.
5. Crowded class-rooms.
6. Standard for promotion too high.
7. Frequent change of teachers.

Due to Pupil:

1. Frequent change of schools.
2. Truancy.
3. Irregular attendance.
4. Late entrance.
5. Ignorance of English language.
6. Slowness, dulness, inattention, or idleness.
7. Mental defect.
8. Physical defects.

Due to Home Conditions:

1. Poverty causing malnutrition and necessity to work after school.
2. Bad environments at home or with associates.
3. Home cares and responsibility.
4. Ignorance and carelessness of parents.
5. Lack of control causing incorrigibility.

Clinics and Laboratories.—Psychological clinics and laboratories are of value in the study of causes and treatment of mental deficiency and backwardness. They should be established in every large university and college which offers courses in pedagogy, and could be established with advantage in connection with normal schools. Material can readily be obtained or referred from the public schools. The equipment should include modern apparatus for the physical and mental examination of applicants.

Most large cities having school medical inspection have experts on psychology and mentality connected with this service and find them most valuable.

TABLE XXX.—SCHOOL INSPECTIONS—FOURTH-CLASS SCHOOL DISTRICTS, PENNSYLVANIA, 1921–1922.

AGE-GRADE TABLE. TOTAL PUPILS EXAMINED.

Grade.	Age of pupils, September 1, 1921.															Total.	Three or more years over age for grade.	
	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.		No.	Per cent.
12th	..	..	..	..	..	14	4	16	12	54	242	1,222	2620	1541	537	6,262		
11th	..	..	..	..	..	3	10	7	45	336	1,764	3,943	2298	767	202	9,375		
10th	..	..	..	..	..	20	66	33	393	2,347	5,436	3,346	1263	320	83	13,307	83	0.6
9th	..	..	..	..	..	12	94	519	3,185	7,392	5,366	2,203	569	142	40	19,522	182	0.9
8th	..	..	..	..	7	155	1,042	5,614	13,837	12,639	8,581	2,420	566	142	63	45,066	771	1.7
7th	..	..	..	5	64	944	5,637	13,582	12,526	8,365	4,292	667	102	24	37	46,245	830	1.8
6th	..	10	15	105	867	5,994	15,093	13,127	9,597	5,737	2,530	327	41	17	26	53,486	2,941	5.5
5th	..	8	42	581	6,124	16,234	13,906	9,796	6,063	3,222	1,532	214	41	5	6	57,774	5,020	8.7
4th	..	32	505	6,459	18,936	15,655	10,124	6,014	3,008	1,519	623	87	19	11	5	62,997	5,272	8.4
3d	9	279	6,553	22,314	17,385	10,016	5,044	2,324	1,124	516	223	29	19	19	29	65,883	4,283	6.5
2d	79	6,207	26,569	18,409	9,157	3,998	1,555	803	367	214	110	23	12	..	..	67,503	3,084	4.3
1st	7410	44,595	21,741	8,447	2,983	1,110	520	288	160	95	55	16	4	3	2	87,429	2,253	2.6
Total	7498	51,131	55,425	56,320	55,523	54,155	53,095	52,123	50,317	42,436	30,754	14,497	7554	2991	1030	534,849		
Three or more years over age for grade . . .						1,110	2,075	3,415	4,659	5,566	5,073	1,363	804	363	291	Total	24,719	4.6
Per cent three or more years over age for grade						1.3	2.4	3.9	5.3	6.4	5.8	1.5	0.9	0.4	0.3			

Figures on the first or *upper broken heavy line* represent the number of children of normal age for each grade.
Between the *two heavy broken lines*, the number of children one and two years over age for each grade.
Figures below the *second* or *lower broken heavy line* represent the number of children three or more years over age for each grade.
The ═══ between the ages of fifteen and sixteen years indicates the end of the compulsory attendance age. At this period a large proportion of the retarded children drop out of school, hence the marked reduction in percentage of over-age pupils.

The Binet Test of Mentality.—The most practical tests are those devised by Binet, and translated into English by H. H. Goddard, of the Vineland Training School for Feeble-minded. A simplified score card by Lewis M. Terman is available and herewith reproduced. It is known as the Stanford Revision. These tests may be varied somewhat according to the originality of the examiner, and in order to obtain trustworthy results, he should bear in mind the following essentials: First gain the confidence of the child. Do not let him know you are quizzing him, but give the impression that you are playing with him. Try to find out something the child is interested in and draw some conclusions from his knowledge on that particular subject. It is not fair, for example, to ask an Italian who is but one month in this country to designate or pick from a number of coins a penny, nickel, dime, etc., and indicate which is of greater value. Common-sense on the part of the examiner with no previously formed opinion as to the mental capacity of the child will invariably net results. A vast store of patience, tact and diplomacy is needed in making these examinations. Fear or distrust once established, makes it impossible to continue the examination.

ABBREVIATED FILING RECORD CARD FOR THE STANFORD REVISION OF THE BINET-SIMON TESTS.

Name.....Sex.....
Age, years.....months..... Mental age.....
I Q.....Examiner.....Date.....
School.....City.....Grade.....
Years attended school.....Quality work.....
Teacher's estimate of intelligence.....
Height.....Weight.....Parents' nationality.....
Social status.....Address.....

III. 6 tests × 2 or 4 tests × 3*

* 1. Points (3 of 4) N E M H
* 2. Obj.'s (3 of 5) K P Kn W P
* 3. Pict. enum. (3 obj. in 1) 1 b c
4. Sex. (Note form of question)
5. Last name
* 6. Sentences (1 of 3) a b c
Alt. Three dig. (1 of 3) a b c

IV. 6 tests × 2 or 4 tests × 3.*

* 1. Lines (3 of 3 or 5 of 6) a b c
2. Forms (7 correct)
* 3. Four pennies
* 4. Square (1 of 3, pencil. Score leniently)
* 5. Sleepy Cold Hungry (2 of 3)
6. Four dig. (1 of 3) a b c
Alt. Sent. (1 of 3, or etc.) a b c

V. 6 tests × 2 or 4 tests × 3.*

* 1. Weights (2 of 3) 3, 15 15, 3 3, 15
* 2. Colors (no er.) R Y B G
* 3. Prettier (no er.) a b c
4. Use def. (4 of 6) chair horse
fork doll pencil table
5. Patience (2 of 3. 1 min. ea.) a b c
* 6. Commissions (order correct) a b c
Alt. Age

VI. 6 tests × 2 or 4 tests × 3.*

* 1. R. hand Left ear R. eye (3 of 3, or 5 of 6)
* 2. Omis. (3 of 4) E M N A
* 3. Thirteen pennies (1 of 2 trials)
* 4. Raining Fire Car (2 of 3)
5. 4 coins (3 of 4) 5 1 25 10
6. Sent. (1 of 3, or etc.) a b c
Alt. A.M. or P.M. (Note form of ques.)

VII. 6 tests × 2 or 4 tests × 3.*

* 1. Fingers. Right Left Both
* 2. Pict. des. (2 of 3) a b c
3. Five dig. (1 of 3) a b c
4. Bow (1 min.) Time
* 5. Fly-B Stone-E Wood-G (2 of 3)
* 6. Diamond (pen. 2 of 3) a b c
Alt. 1. Days Checks T Th Sat
Alt. 2. Three dig. bkd. (1 of 3) a b c

VIII. 6 tests × 2 or 4 tests X 3.*

1. Ball (inferior plan)
* 2. 20–1 (40 sec., 1 er.) Sec. Er.
* 3. Broken Late Hit (2 of 3)
* 4. (2 of 4) Wood-C Apple-P
Iron-S Ship-A
5. Sup. def. (2 of 4) B T F S
* 6. Voc. (20 in both or 10 in 1)
Alt. 1. Coins (all) 5 1 25 10 1.00 50
Alt. 2. Dict. Time

IX. 6 tests × 2 or 4 tests × 3.*

* 1. Day Month Day of m Year
* 2. Weights (2 of 3) a b c
3. Change (2 of 3) 4–10 12–15 4–25
* 4. Four dig. bkd. (1 of 3) a b c
* 5. 3 words (2 of 3) a b c
6. Rhymes (2 of 3, 1 min. ea.) a b c
Alt. 1. Months (1 er. 2 checks) Apr. July Nov.
Alt. 2. Stamps

X. 6 tests × 2 or 4 tests × 3.*

* 1. Voc. (30 in both or 15 in 1)
* 2. Absurd. (4 of 5) a b c d e
3. Designs (1 correct, 1 half) a b
4. Read. Mem. (8) Sec. (35) Er. (2)
* 5. Opinion Undertake Judge (2 of 3)
* 6. Naming words (60 in 3 m. or 28 in 1)
Alt. 1. Six. dig. (1 of 2) a b
Alt. 2. Sent. (1 of 3, or etc.) a b c
Alt. 3. Fm. Bd. (3 in 5 m.) a b c

XII. 8 tests × 3 or 6 tests × 4.*

* 1. Voc. (40 in both or 20 in 1)
2. Abst. Words (3 of 5) a b c d e
3. Ball (superior plan)
* 4. Mixed Sent. (2 of 3, 1 m. ea.) a b c
* 5. Fables (score 4) a b c d e
* 6. Five dig. bkd. (1 of 3) a b c
* 7. Pict. interpret. (3 of 4) a b c d
* 8. (3 of 5) Snake, cow, sparrow
Book, teacher, newspaper
Wool, cotton, leather
Knife-blade, penny, wire
Rose, potato, tree

XIV. 6 tests × 4 or 4 tests × 6.*

* 1. Voc. (50 in both or 25 in 1)
2. Induct. 1 2 3 4 5 6
* 3. Pres. K. Power Acces Tenure (2 of 3)
* 4. Prob. Fact (2 of 3) a b c
* 5. Arith. (2 of 3, 1 m. ea.) a b c
6. Clock (2 of 3) 6–22 8–8 2–46
Alt. Seven dig. (1 of 2) a b

XVI. 6 tests × 5 or 4 tests × 7½.*

* 1. Voc. (65 in both or 33 in 1)
* 2. Fables (score 8) a b c d e
3. Abs. words (3 of 4) a b c d
* 4. Boxes (3 of 4) 2–1 2–2 3–3 4–4
* 5. Six dig. bkd. (1 of 3) a b c
6. Code (2 er. 6 m.) Er Time
Alt. 1. Sent. (1 of 2. no er.) a b
Alt. 2. Phys. Relat. (2 of 3) a b c

XVIII. 6 tests × 6 or 4 tests × 9.*

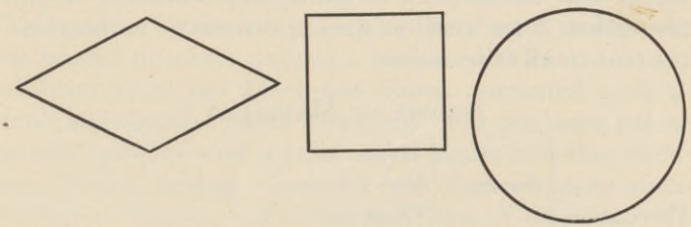
* 1. Voc. (75 in both or 38 in 1)
2. Folds Holes Location
* 3. Eight dig. (1 of 3) a b c
* 4. Passages (one) a b
* 5. Seven dig. bkd. (1 of 3) a b c
6. Ingenuity (2 of 3, 5 m. each)
3 and 5, get 7 (begin with 5)
5 and 7, get 8 (begin with 5)
4 and 9, get 7 (begin with 4)

Years	*Months*	
3		Time begun
4		Finished
5		Total Time
6		Remarks
7		
8		
9		
10		
12		
14		
16		
18		
Total		

List 1.	*List 2.*
Score	*Score*
Both lists	
1. gown	1. orange
2. tap	2. bonfire
3. scorch	3. straw
4. puddle	4. roar
5. envelope	5. haste
6. rule	6. afloat
7. health	7. guitar
8. eye-lash	8. mellow
9. copper	9. impolite
10. curse	10. plumbing
11. pork	11. noticeable
12. outward	12. muzzle
13. southern	13. quake
14. lecture	14. reception
15. dungeon	15. majesty
16. skill	16. treasury
17. ramble	17. misuse
18. civil	18. crunch
19. insure	19. forfeit
20. nerve	20. sportive
21. juggler	21. apish
22. regard	22. snip
23. stave	23. shrewd
24. brunette	24. repose
25. hysterics	25. peculiarity
26. Mars	26. conscientious
27. mosaic	27. charter
28. bewail	28. coinage
29. priceless	29. dilapidated
30. disproportionate	30. promontory
31. tolerate	31. avarice
32. artless	32. gelatinous
33. depredation	33. drabble
34. lotus	34. philanthropy
35. frustrate	35. irony
36. harpy	36. embody
37. flaunt	37. swaddle
38. ochre	38. exaltation
39. milksop	39. infuse
40. incrustation	40. selectman
41. retroactive	41. declivity
42. ambergris	42. laity
43. achromatic	43. fen
44. perfunctory	44. sapient
45. cauistry	45. cameo
46. piscatorial	46. theosophy
47. sudorific	47. precipitancy
48. pärterre	48. paleology
49. shagreen	49. homunculus
50. complot	50. limpet

Reading Test × 4.

Memories ..... Time .....
Mistakes in reading .....
New York .....
September 5 .....
a fire .....
last night .....
burned .....
three houses .....
near the center .....
of the city .....
It took some time .....
to put it out .....
The loss .....
was 50 thous. dol. .....
and 17 families .....
lost their homes .....
In saving .....
a girl .....
who was asleep .....
in bed .....
a fireman .....
was burned .....
on the hands .....



Mentality is no longer a psychological study, but a medico-pedagogical one; no longer is the child left to its own salvation of acquiring a set education and keeping pace with the average; or failing to progress, idles away the school years.

There have been many attempts to define normal mentality. The author offers the following effort: Normal mentality consists of seeing things as they should be seen; hearing things as they should be heard, and doing things as they should be done. There are innumerable deviations

from the normal and most people have some variations. Present day studies have endeavored to measure and place each one in scales.

In former years if a man exercised usual mentality they said he had "horse sense," later they called it "common sense," and now it is measured to the Nth degree in intelligence quotients.

Mentality is directly dependent upon the efficiency of the "Think Plant or Factory." If we compare the process with a telephone system, we note several units, all of which must be equipped and in coöperative working order. The brain is the generating system of the plant and the nerves are the wires. The receiving stations are the five organs of sense, the eyes for perception, the ears for hearing, sensation for feeling, smell and taste. To these may be added the more complicated wireless apparatus, imagination and memory.

The evaluation of the parts of the mentality outfit is, 50 per cent on the plant or brain; 35 per cent on vision or perception; 5 per cent on speech; 5 per cent on hearing; 5 per cent on all other senses.

SCHEME OF MENTALITY.

- Perception
  - Seeing
    - Look
    - See
    - Observe
  - Hearing
    - Hear
    - Understand
    - Reflect
- Sensation
  - Touch
  - Taste
  - Smell
- Memory
- Imagination
- Judgment
- Reasoning
- Foresight

Any endeavors to measure an individual's mentality and place him in a scale must consider each of the above parts which enter into his thoughts and acts. If any of the senses is crippled, defective or missing, the individual may utilize another sense and so increase its value to overcome the effect of the defect. Lost hearing may be supplemented by the eyes and use of lip reading; lost vision may be replaced by sense of touch.

In utilizing mentality tests we must differentiate mentality from education. Mentality is capacity, and many tests depend not on capacity but experience, training, practice and opportunity. Race, social class and many factors influence the results.

Physical development does not necessarily influence mental development. Many an invalid, puny and frail has given to the world real knowledge and progress. We should also know that there is a mental adolescence as well as a physical and that this differs for different individuals. This accounts for the success in later life of many a child who was labeled in school days as a backward child.

Fifteen years ago Binet and Simon originated tests to detect and classify mental defectives. For ten years following this splendid work several psychologists including Kuhlman, Yerkes, Bridges, Hardwick and Terman made modifications to improve and widen the scope of this work. In 1918, Arthur Otis, Stamford University, originated mental tests, chiefly adapted for commercial purposes. During the war this was a basis for the army tests, Alpha and Beta, which proved so valuable in quickly placing larger groups of men in classes of endeavor best suited to their mental capacity.

In the past five years there have originated 350 sets of tests, mostly named after some worker in the field. It would be impossible to explain in a work of this character many of these tests. An analysis of them show marked similarity. The trend has been to go away from intelligence

tests which classify children in age and mental capacity groups. The present-day endeavor is to diagnose a pupil's ability in each separate endeavor, learn his difficulties and short comings, and suggest methods of building up the weak spots. It is not school systems but children that are important. Often these tests show the weakness of a system, a method of teaching or a curriculum more than the inability of the child to learn. These achievement tests are now available on every branch of study and even vocational training. The teacher should utilize them freely but must not make wrong deductions. They lead to constructive ideas only when applied by a teacher who is a thinker and knows something more than to follow a manual.

Certain factors must be considered in all tests. Physical defects such as defective vision will alter results. A child who cannot see the test paper cannot answer the questions correctly. Accidents of previous schooling, training and environment, personality of the tester, methods employed, unusual fear and nervous state of a child realizing he is being examined, all vitiate the results obtained.

Classification and definitions of terms used; classifications of intelligence quotients and norms can be obtained from any of the many books devoted to the subject.

Every medical inspector, nurse, teacher and educator should have a working knowledge of mentality testing, achivement tests, and how to best apply them.

We need trained physicians who have combined a knowledge of psychology with medicine to an extent where he can diagnose each child's individual failings, not with a ruler and by fractions, but grossly to aid in placing the child correctly in a school system, and later on the road to his life work.

An analysis of 1000 tests taken from the most popular standard tests and measurements showed 925 required the use of the eyes of the child being examined and 75 required hearing. This emphasizes the importance of eliminating

defective vision, especially if existing to a severe degree, and also impaired hearing, before conclusions are drawn from group tests. Many tests are poorly printed on poor paper, the use of fine type adding to the confusion. Pictorial absurdities have the eye of a bird missing, a cat with one toe nail missing, a watch with a hand missing. It would be well if psychologists or teachers who are compelled to wear glasses for defective vision, would remove them and try to pass some of the tests.

The numerous tests for groups have some form or modification of the following groups: (1) Pictorial absurdities; (2) checking identities; (3) number relation series; (4) extent of vocabulary; (5) range of information; (6) synonyms and atonyms; (7) maze threading; (8) completion of sentences; (9) reading directions and action; (10) analogies of mixed relation words; (11) judgment of best answer out of several following a question; (12) dividing geometrical figures.

Educators and teachers must not expect too much from mental testing. They have their uses and limitations. The psychologist may standardize tests, offer norms and quotients; to utilize results to practical advantage needs the tact, the experience and the human insight of a trained interested teacher.

These numerous group tests offer little to the teacher who desires to know why a certain child fails in class, and what she should do to aid him. One of the modifications of the Binet test properly and carefully used, may tell the teacher which faculty is at fault, but she must proceed further in diagnosis to know what to recommend or do. The teacher and the system are interested in the individual child whom she must teach, or explain why she has failed. Merely to say he or she is simply dumb or mentally defective will not be accepted.

Achievement tests, eliminating poor vision, may aid in locating one or more branches which the intellect will not grasp.

The practical, interested teacher is occasionally as good as any group test in classifying grossly the varying brightness

of her pupils. This was proven recently by first asking each teacher in a school with 1200 pupils to make a list of all the pupils in their classes, arranging them in the order of their ability and brightness.

The pupils were then given two of the popular group tests. A comparison of the teachers lists with the quotients of the pupils revealed little difference. Speed is a factor, rated in tests; and children vary; some are tortoises and some hares. The tortoise sometimes gets there. A child recently referred to the writer for examination as to its being mentally defective, passed No. 1 a week later in an arithmetic-achievement test.

The rating sent home to parents each month cannot often be used as a guide to the children's mental ability.

In the first edition of this work, the author included details of the Binet test, but omits it in this second edition, as it is available at a small expense and with little difficulty. In its place he offers the details of an investigation on relation of subject failures and general standing in class. For the report he expresses his appreciation to Mr. George B. Reisse, supervising principal of the Widener School and the others of his committee.

It may seem to some that the following detailed report is unnecessary and beyond the confines of health supervision; that it is purely pedagogical. The physician or others weighing cases of retarded mentality and non-promoted pupils should know all evidence for the verdict, the source and how much weight to give it. So-called school ratings is generally the chief evidence offered. The author believes this unusual report deals with a phase of mentality which has been neglected and deserves careful consideration.

A Method of Analysis of Pupils' Reports, Showing the Relationship between Subject Failures and General Standing. — (This study is based on reports of pupils of the public schools of Philadelphia. In every city, however, pupils are given subject grades and general standing. The problem pre-

sented, of the relation between such subject grades and such general standings, must be in evidence in every city. The paper is suggestive of a scientific method that may be applied to the local problem.)

The monthly report, issued to pupils in the public schools of Philadelphia, gives, along with other information, the two items whose relationship is the subject of this study: (1) The standing in each subject on a two-point basis, that of satisfactory or unsatisfactory; and (2) the general standing for each month on, presumably, a ten-point scale. Unsatisfactory work in any subject is indicated by placing a cross opposite that subject; and a general standing of "7" is regarded as representing satisfactory general achievement. The face of a report, as actually issued, is reproduced on page 376.

At present, there is no definite regulation determining the conditions which must be met in order to obtain any particular grade of general standing. This has been left purposely to the judgment of the teacher. She arrives at this judgment by evaluating the relative importance of the several subjects, and by considering the extent of the failure or success achieved by the pupils in these subjects.

The report, however, is issued primarily for the information of parents and pupils. As issued, it fails to give the data, the relative value of the subjects and the degree of success or failure in each subject, which were the factors employed by the teacher in arriving at the general standing. Two reports, issued in different schools, may show exactly the same subject failures and yet different general standings. For example, John Smith, in school X, may have crosses in arithmetic and written English, and be given a standing of "7;" whereas John Brown, in school Y, having the same crosses, may be rewarded with a present standing of "6." The former is promoted, and the latter fails to be promoted; yet the reason, from the mere study of the report, is not apparent.

School year ending June 30, 192....	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	Total
Sessions present											
Sessions absent											
Sessions late											
Conduct											
Effort											
Present standing											
Arithmetic											
Civics											
Cooking											
Drawing											
English — Oral											
English — Written											
English — Reading											
English — Spelling											
Geography											
History											
Penmanship											
Physical education											
Physiology											
Sewing											
Shop work											

Work is satisfactory in all subjects except those marked x.

To the Parent or Guardian	Parent's Signature	
1. Irregular attendance interferes greatly with school progress. 2. "Conduct" and "Effort" are reported by Letters; "Present standing" by Numbers in accordance with the following Scale of Marks Satisfactory: E = Excellent—10 or 9; G = Good—8; F = Fair—7 Unsatisfactory: P = Poor—6; VP = Very Poor—5 to 0 3. "Present standing" indicates the general rating of the pupil's work from the beginning of the term to date; a mark of 7 or higher at the close of the term entitles the pupil to promotion. 4. This report will be issued on the last school day of January and June; for every other month, on the second school day of the following month. 5. Please examine the report carefully; sign and return promptly. 6. You are cordially invited to call upon the principal for further information in regard to any point suggested by the report.	Sept.	
	Oct.	
	Nov.	
	Dec.	
	Jan.	
	Feb.	
	Mar.	
	April	
	May	
	June	

Note.—The above card could be improved and aid in the medical service by having a space to insert any special physical defect the child has which may interfere with its education.

When it is understood fully how the teacher arrived at her judgment in these two cases, the apparent discrepancy is explained. In the absence of this information, the question then presented itself: Could not the information given the parent, the subject failures be the basis for the general standing? With this thought in mind, the present study was instituted. The problem involves an analysis of a number of reports which actually had been issued with the purpose of discovering, if possible, whether a definite rule could be established which would not do too great violence to the results as reached by the teacher's judgment.

It was felt that a thousand reports would give a typical representation of the conditions that obtain generally. These reports were taken from the records of seventh- and eighth-grade pupils, because the course for these grades includes all of the subjects enumerated on the monthly report. With the exception of this limitation as to grade, the reports otherwise were chosen by the schools without any principle of selection. The records are for the months of April and May, 1921, these months probably being most representative of the work of the spring term. Two hundred reports were supplied by each of the 5 schools, and represent ratings given by 24 different teachers. The contributing schools were selected as representative of different social groups. (1) Contains a mixed negro and white population; (2) a larger negro, and a white foreign population with less favorable home conditions; (3) a distinctly Jewish population; (4) predominantly Italian; and (5) a practice school, a rather select group, all white and for the most part American. The copies of the reports received from the schools gave only the subject failures, indicated by the cross, and the general standing.

Table XXXI presented below, gives the number of subject failures found on the 1000 reports, arranged according to school. The letters at the top of the table, A, B, C, etc., indicate the different schools; the sixth column shows the totals, and the last column gives the totals per hundred, or on a percentage basis. The three subjects that are marked with the asterisk are subjects pursued by either boys or girls alone, and hence the total number of failures in these instances represent failures for approximately 500 instead of 1000 pupils.

An outstanding feature of this table is the variation in failure in the different subjects, ranging from 1.2 per cent in the case of cooking to 34.5 per cent in arithmetic. The variation of the distribution of failures within the scope of each individual school is also noteworthy; for example,

School C shows but one failure in oral english, and School E 33. The totals at the foot of the table show that in School C 200 reports contained but 183 crosses, whereas in School D the same number of reports contained 427 crosses. Reference to the term promotion of the 5 schools showed that the percentage of promotion varied, as it should, inversely as the number of crosses that appeared on the reports. The range of these percentages of promotion, 76.9 per cent to 89.4 per cent, gave further assurance that the schools selected were quite representative. This variation, in the number of crosses per school, is seen to better advantage in Table XXXII.

TABLE XXXI.—ANALYSIS OF 1000 REPORTS SHOWING THE DISTRIBUTION OF SUBJECT FAILURES.

School.	A.	B.	C.	D.	E.	Total.	Per 100.
Reports	200	200	200	200	200	1000	
Arithmetic	92	71	38	61	83	345	34.5
Civics	2	1	9	30	9	51	5.1
Cooking*	3	2	..	1	..	6	1.2
Drawing	11	10	..	27	..	48	4.8
Oral English	14	5	1	28	33	81	8.1
Written English	60	37	51	42	60	250	25.0
Reading	5	7	..	22	31	65	6.5
Spelling	16	11	18	29	20	94	9.4
Geography	51	42	13	22	54	182	18.2
History	43	35	34	66	36	214	21.4
Penmanship	6	6	..	40	..	52	5.2
Physical education	2	..	..	10	46	58	5.8
Physiology	5	13	18	17	40	93	9.3
Sewing*	..	1	..	6	1	8	1.6
Shop*	7	..	1	26	13	47	9.4
Totals	317	241	183	427	426	1594	159.4

* Approximately 500 pupils.

This table is read: The number of failures in arithmetic in School A is 92; School B, 71; School C, 38; School D, 61; School E, 83; total, 345; percentage, 34.5.

For the preparation of Table XXXII, the reports of each school were divided into two groups: reports of pupils who "passed," that is, received a general standing of 7 or higher, and of those who "failed," that is, received a general standing of less than 7. This table shows, then, for each school, the

number of subject failures made by pupils who passed, and the number of such pupils; also the number of subject failures made by pupils who failed, and the number of such pupils.

TABLE XXXII.—A SUMMARY OF THE NUMBER OF CROSSES (SUBJECT FAILURES) APPEARING ON REPORTS OF PUPILS WHO WERE RATED BELOW 7, AND THE NUMBER OF PUPILS SO RATED; ALSO, THE NUMBER OF CROSSES APPEARING ON REPORTS OF PUPILS WHO WERE RATED AS 7 OR OVER, AND THE NUMBER OF SUCH PUPILS.

School.	A.	B.	C.	D.	E.	Total.
Crosses on reports of pupils graded as 7 or over .	155	212	82	213	203	865
Pupils	159	193	175	154	148	829
Crosses on reports of pupils graded below 7 . .	162	29	101	214	223	729
Pupils	41	7	25	46	52	171

TREATMENT OF THE MENTAL DEFECTIVE, SUBNORMAL, OR RETARDED CHILD.

The true mental defective, or those in whom there are defects of brain with total or almost total lack of function of this organ are not subjects for training in public schools. They should be institutional cases, where life and training is mapped out along scientific lines.

In the case of the subnormal, dull, and retarded child, a thorough investigation should be made for the possible underlying causes of the defect and the proper treatment instituted. Where any defect has been located, whether in the school system, the home, or the child, every effort must be made to correct these defects.

First, place the school, its system, and its teachers in the best possible position to care for and train the child. Study the teacher and her methods, her health, and temperament. Find out why in certain branches the child excels and in others fails. Study some pedagogical method of increasing interests in dull subjects. Individual interest and encourage-

ment by a teacher often leads a seemingly dull boy to a higher standard. His weak points should not be dwelt upon, but his good points encouraged. Human Nature asserts itself chiefly in childhood, he is then most amenable to kindness.

Home conditions when at fault can often be corrected by visits and friendly, tactful advice from the nurse, teacher, or social visitor. In cases of poverty call freely for aid from the various philanthropic organizations at your command. An interested enthusiastic person will always find a solution for the many faulty conditions that may be found at the homes.

Physical defects when found should always be corrected whether or not they seem to contribute to the mental dulness. It is not necessarily true that all children with physical defects are subnormal mentally, but certain defects, especially of the eyes and ears, are sure to handicap a child in its progress.

Dr. L. Wessels, ophthalmologist for the schools of Philadelphia, submits the following interesting study of 5000 school children examined under a mydriatic for defective vision. Using age and grade as a factor of mentality, he concludes that 75 per cent of these children are backward.

There are many interesting features connected with this table that are worthy of study.

Of the number 1170, or 23 per cent, were in the average grades, and only 281, or 5 per cent, were above the average grades.

The majority of the children were below the fourth grade.

Those below the fifth grade were 4297, or over 83 per cent.

Only 1909, or 37 per cent, were above the third grade.

Only 849, or 16.5 per cent, were above the fourth grade.

Only 297, or 5.75 per cent, were above the fifth grade.

Only 92, or 1.78 per cent, were above the sixth grade.

Only 33, or 0.64 per cent, were above the seventh grade.

TABLE XXXIII.—AGE OF PUPILS.

Grade.	6	7	8	9	10	11	12	13	14	15	16	Total.	Above normal, average age.
8th								8	12	7	6	33	13 or 40%
7th							7	21	20	10	1	59	31 or 53%
6th					1	16	54	82	39	10	3	205	134 or 65%
5th				1	39	112	183	141	55	21	0	552	400 or 72%
4th				56	196	235	264	224	69	15	1	1060	808 or 76%
3d		1	83	213	291	279	227	135	47	17	1	1294	997 or 77%
2d	1	68	246	278	276	150	110	62	36	8	1	1236	921 or 74%
1st	134	186	160	90	60	37	19	11	7	1	6	707	391 or 55%
Total	135	251	489	638	863	829	864	684	285	89	19	5146	3695 or 72%
Above normal, average age			160	368	627	701	803	655	273	89	19	3695	
Per cent			32%	57%	73%	85%	93%	96%	97%	100%	100%	72%	

Figures on the broken lines represent the positions of the normal average school child.

Note among other things in the table that the number of pupils suddenly drops around the age of fourteen, the legal age at which children are permitted to work. Out of 285 children fourteen years old, 273, or about 97 per cent, were backward; the majority were below the fifth grade.

These figures seem to indicate that most of these children leave school before they reach the fourth grade, or that the children in the higher grades have better vision or have their defects corrected with glasses.

This investigation teaches the importance of detecting and correcting defective vision in children in the lower grades, as the early correction of these defects enables the child to reach a higher grade and insures a better education when he reaches the quitting age of fourteen. Furthermore, if less children are left behind in the lower grades, it will help to eliminate the overcrowding that exists in these grades.

Children's eyes should be examined before they enter school. If this is not possible, the medical inspector should devote most of his time to examining the eyes of children in the kindergartens and first grades, as the correction of many grave visual defects then will greatly promote the future progress and usefulness of the school child and future citizen.

In backward children it is a great advantage to have the medical examinations of the eyes, ears, nose and throat made by specialists in these branches of medicine. In large cities special clinics for school children should be held in these specialties in connection with systems of medical inspection.

Special Schools and Special Classes.—Special schools should be of two classes: 1. Parental for the instruction of incorrigible and truant children.

2. Special schools for the instruction of the backward child not a mental defective, imbecile, or idiot.

Parental schools, as the name implies, take the place of the parents and supply the home discipline which is lack-

ing. Care must be exercised that the good accomplished in these schools is not counterbalanced by home conditions.

Special schools are for the training of children as individuals and not in large groups. The curriculum is made to suit the individual child and the classes are small enough to admit of the teacher giving personal instruction. Equipment and courses of study are arranged to suit the capabilities and interest of the children, and the teaching is performed by specially trained teachers.

Special classes should be instituted in all large schools to instruct the child who is not dull or backward, but requires extra time and individual instruction to bring him up to the standard of the other pupils of his class. This may include pupils who fail in one or two subjects. These classes also should be supervised by specially trained teachers.

Specially qualified or trained teachers for special schools and classes: The applicants for these positions should be closely studied as to their temperament and disposition. Kindness, gentleness, and an excess of patience are required, and an excellent training for such a position may be obtained at one of the institutions for feeble-minded children. In the State of New Jersey, near Philadelphia, is the New Jersey Training School for Feeble-minded, at Vineland. This is an ideal institution, giving a special summer course for those desiring to take up this line of work. In Philadelphia at the University of Pennsylvania there is also a summer course to train special teachers.

The normal schools and schools of pedagogy in other large cities should also establish such courses and train teachers to fill these positions. Because of the additional qualifications and training required of teachers of special classes, they should receive a greater compensation than the ordinary teacher, thereby inducing teachers to qualify for these positions.

PART VII.

ALLIED SUBJECTS OF SCHOOL HEALTH SUPERVISION.

MEDICAL INSPECTIONS BY TEACHERS OR NURSES.

While the ideal system and best results are obtained by trained physicians as school inspectors, it is occasionally necessary for others to conduct such work. If lack of funds or other cause prevents the employment of physicians, the routine inspections may be made by nurses or teachers. They, however, should not endeavor to make an absolute diagnosis or prescribe treatment. In all towns there are to be found some public-spirited physicians who can be interested in the undertaking, and will volunteer to examine children sent to them, and even make an occasional visit to the school. In a community where no physician is employed one of these volunteers should be called on for cases requiring diagnosis and treatment. Many of the gross physical defects can be detected by the teacher. She can test vision and hearing according to the instructions given in the sections of this work, and as a condensed guide the procedure may be conducted as follows:

When examining the eyes, use the test card placed in proper lighting—20 feet distant. If the child shows normal vision and still has headaches and other symptoms referable to eye-strain, insist on a thorough examination by a competent ophthalmologist.

In testing hearing use the whispered voice test, see page 273.

The nose and throat can be examined only by a physician. The teacher can label a child as a "mouth breather" or "nasal obstruction," and leave the diagnosis of adenoids or enlarged tonsils to the doctor.

Skin lesions are numerous and difficult for a layman to diagnosticate. By assuming this responsibility what may seem as only "pimples" or "eczema" or "stomach rash" may be measles, chicken-pox, smallpox, or other contagion.

Carious teeth, marked orthopedic defects, diseases of nervous system and many special and systemic defects can be recognized by the teacher and referred to dentists or physicians.

The prevention of epidemics of contagious diseases, one of the most important functions of medical inspection, can be well controlled by the teachers.

Each morning before beginning the lessons have a classroom inspection. The teacher asks the class to rise at the right hand side of the desks; extend arms in front of body and hold heads erect. The teacher takes her position by a window with her back to the light, and the children pass in front of her in single file returning to their seats. This entire procedure for a class of 30 or 40 should take a little over five minutes.

With note paper and pencil she notes uncleanliness, any rash on face or hands, redness or watering of eyes, swelling on face or neck, neck bandaged (sore throat), scaling or peeling of hands, cough, running of nose, and ear discharge.

Exclude every child with a rash and fever; every child with any symptoms of a sore throat; every child who vomits in school, as scarlet fever often begins with it.

An excluded child for a suspicious contagious disease should not be returned to its class until it presents a certificate from a physician stating it is free from contagion.

Teachers may be guided as to the conditions requiring attention by reference to the following:

Symptoms of Fever in General.—Headache, lassitude, languid expression of eyes, sometimes flushed cheeks, at other times pallor; heat of skin and rapidity of pulse.

Early Symptoms of Measles.—The earliest symptoms are those of a cold. There is feverishness, eyes are reddened, watery, and sensitive to light; there is a discharge from the nose and the patient sneezes and coughs, the cough being of

a dry, high-pitched character. These symptoms often last for three days before the rash comes out. Later a blotchy rash appears on the face, neck and body. The disease is highly contagious even at an early stage.

Scarlet Fever.—Scarlatina is ushered in usually by vomiting, although this may be absent. The throat is often sore from the beginning. There are the usual symptoms of fever. On the second day a red rash appears all over the body, the cheeks are flushed but the lips and chin are pale.

Patients convalescent from an unsuspected scarlet fever returning to school prematurely may exhibit scaling hands, discharging ears, enlarged glands at angle of jaws, and prominent red elevations upon the tongue.

Diphtheria.—The symptoms of diphtheria are those of fever and sore throat. There may be discharge and bleeding from the nose.

Mumps.—In mumps there is a painful swelling on one or both sides of the face in front of the ear.

Whooping-cough.—In whooping-cough the patient has an ordinary cough for a few weeks, then a characteristic cough sets in which discloses the nature of the disease. It comes on in distinct spells, during which the face is puffed and reddened, the eyes congested and watery, and a loud whooping sound is made; sometimes the paroxysm is followed by vomiting.

Teachers can do most for the physical welfare of their pupils by teaching practical hygiene. Anatomy and physiology should be made interesting by practical lessons on healthy living. Stories which bring in lessons of hygiene appeal to the child and leave an impression. Rewards offered for periods of cleanliness are incentives to keep clean. Physicians should be invited occasionally to give health talks and if at convenient times of day, the parents can be invited to such meetings. These give excellent opportunities to discuss public health problems which advertise and accomplish many valuable reforms for a town.

Teachers should always be well acquainted with the sanitary conditions of their school houses and urge the abating of all nuisances or things prejudicial to the health of their scholars.

Keeping of Records.—It is valuable for the teacher to keep a permanent record of the physical condition of her pupils. Such records should be kept on the back of the attendance or school report cards, or on a separate record, and should be transferred from room to room or school to school with the child. Such record should include date of examination, conditions of the eyes, ears, nose and throat, other defects, and the date and character of any sickness during term. This admits of a ready comparison of physical defects, standing in class, and progress in school. Many cases of non-promotion can be traced by the information on these reports.

RURAL SCHOOL MEDICAL SUPERVISION.

While medical supervision in rural districts offer certain problems not found in a city school system, the purposes and principles are practically the same. The qualifications of the medical inspector are the same but he must reside within easy access to the district covered. The salary which can be afforded by small school districts is usually meagre, so preference should be given to a physician who shows a love for this work and a good public spirit. The amount of time which he can devote is limited, requiring more coöperation and interest by the teachers and other educational authorities.

The forms needed for records, reports and notices to parents, physicians and health authorities should be as concise and simple as it is possible to devise. Details of information and instruction should be kept off the forms and placed in manuals and pamphlets of instruction distributed to all who are concerned in the work. Unfortunately many States have a profusion of complicated printed forms which

require valuable time and effort. Simplicity of records and bookkeeping is the keynote of successful school inspection. The author herewith reproduces a few samples of forms. The system described for city inspection with a few alterations could readily be adapted to any school system.

The protection of the schools from communicable diseases is the foremost object of medical supervision. In rural communities with no continuous medical service, the responsibility for the reporting of cases of contagion and taking emergency measures must of necessity fall frequently to the teachers and the head of the households. Class-room inspections as described in this work should be frequently practised. This form of inspection is most practical as evidenced by being adopted by the Public Health Service of the United States Government in examining immigrants for both physical and mental condition. The physician who is a trained alert observer can examine hundreds of children in a short time and pick out almost every worth-while defect. There could be no better training for a medical inspector than observing the government officers at work on the immigrants at Ellis Island.

The State Department of Health and also of Education should improve the efficiency of their physicians and nurses by practical talks and lectures given by people who both know the subject and how to impart their knowledge to others. Training in observing actual cases of communicable diseases and the common skin diseases is most valuable.

The medical inspector on his visit to a school should examine all absentees whose cause of absence has been personal illness. In the interval between the visits of the inspector, the teacher should not permit a child absent for illness to take its seat in class unless it brings a note from a qualified physician stating the cause of absence. At the beginning of each school term a record should be made for each child stating any illness it may have had during the past year. This information should be obtained from the parent or guardian on a form supplied by the department.

SCHOOL HEALTH SERVICE.

Exclusion Notification to Parent or Guardian.

.....192....

Name of pupil..... *Address*.....

In accordance with section 575, chapter 627 of the Education Law, the pupil named above is hereby temporarily excluded from.....school for the following reasons:

.....

.....

{He[1] / She} may return on presenting a certificate from either the family physician, the local health officer, or the medical inspector of schools, showing that the objections to {his[1] / her} attendance upon school have been removed.

.....

.....

Official position.

.....

Address.

This notice should be issued by either the medical inspector, superintendent, principal or teacher, and mailed, or delivered to the parent or guardian.

[1] *Cancel words not applying.*

Notice to Parent or Guardian.

The disease or condition reported on the other side of this card is contagious, and liable to be transmitted to other children. You are advised to consult your family physician *at once* for both the health of your child and the safety of others.

Should you for any reason be unable to follow this advice, kindly notify at once the person from whom this notice is received, who may be able to advise and assist you.

Notice to Health Officer.

Dr......, *Health Officer*, City (Village) (Town)[1] of.....

....., a pupil attending Public School No.....,

(Name of pupil)

was this day, pursuant to the provisions of Section 575 of the Education Law, sent to h..... home, ... suffering with symptoms

(Address of pupil)

suggestive of.....

The medical inspector of schools, the school nurse, or the school authorities, will be pleased to lend you every possible coöperation in the management of this case, or any others which may arise.

Yours very truly,

.....

Superintendent, Principal, Medical Inspector.

.....

Address.

.....A.M.....192

.....P.M.

[1] *Cancel words not needed.*

A convenient form for a return certificate follows:

THIS CERTIFIES that..... has fully recovered from an attack of....., has complied fully with health regulations regarding quarantine, disinfection, etc., and is not likely to convey infective material.

.....
Attending (or Examining) Physician.

Countersigned by

.....
Medical Inspector.

.....
Health Officer.

Date.....

(If issued by attending physician, certificate must be countersigned by the health officer or school medical inspector.)

Parents should be furnished with a small card naming and clearly describing the reportable diseases, and calling attention to the laws which require the parent to notify the health officer as well as the school when a child of theirs is afflicted with any reportable disease. The teacher should likewise be supplied with a manual of simple information on how to detect contagion and what action to take in the absence of the medical officer.

Physicians should be censured when found derelict in reporting contagion. There are many splendid opportunities for a health officer to conduct educational campaigns among teachers, physicians and the public, and he should always be alert to take advantage of these occasions. Teachers and public should be acquainted with the legal periods of exclusion from school and the approved methods of disinfection after recovery of a patient. Good results are always obtained from health talks to the pupils of a school by the inspector.

Rural school medical supervision should be brought to a standard, where it is performed quickly, effectively and yet economically.

Toward the end of the quarantine period, if the *attendance officer* will daily compare his list of absentees with the health officer's record of cases of communicable disease reported,

he will be able to secure the return of many children to school *much earlier* than otherwise and thus offset much of the school time lost to pupils excluded on suspicion. In a case to which no physician has been called or perhaps but one visit has been made at the onset of the disease, the health officer may not be requested promptly by parents to permit children to return to school and unless the health officer's records are daily followed up many children may remain out of school unnecessarily.

To ascertain the susceptibility of any given school-room to any communicable disease New York State Department of Health uses the following chart on file in each room.

Susceptibility Chart.

Name of School.....Grade.....City / Village / Town } of.....

For School Year beginning.....Name of Teacher.....

Names of pupils.	Chicken-pox.	Diphtheria.	German measles.	Poliomyelitis.	Measles.	Mumps	Scarlet fever.	Smallpox.	Typhoid fever.	Whooping-cough.			Date successfully vaccinated.

Use + to indicate child has had disease or has been successfully vaccinated; use # to indicate that parents' statements are verified by Health Officer's records, or in the case of vaccination that scar has been examined and found to indicate that child has been successfully vaccinated. If a child is successfully vaccinated or has any of the diseases mentioned during the school term the fact should be noted on the "Disease Census Card" and (by a +) on this sheet.

DISEASE CENSUS CARD.

To be filled out by child's parent or guardian and returned to teacher

1.....2.....
Family name *Given name in full*

3.....
Address

4.....5.....
Place of birth *Age*

6.....7.....8.....
Height *Weight* *Date of successful vaccination*

Check the diseases you know this child has had:

Chicken-pox	Measles	Tonsillitis
Diphtheria	Mumps	Tuberculosis
German measles	Scarlet fever	Typhoid fever
Infantile paralysis	Smallpox	Whooping-cough

[Signed].....
Parent or guardian

Inspections for physical defects differ in no way from the methods described in such sections in this volume. Record keeping likewise may be similar. The follow-up-work to see that findings and recommendations of the inspector are acted upon should preferably be done by a nurse. Where a nurse is not available, the teacher should assume the responsibility. Red Cross nurses often act in this capacity and results are most gratifying. All laws of health especially those referring to vaccination should be enforced and no exceptions made. It is necessary to forward all records promptly to the central office of the health department or the State educational bureau which ever is in charge of the work.

The requirements of school physicians as well as the compensation varies greatly in different States. An idea can be obtained of this phase of school inspection by a study of New York State, where the responsibility is entirely in the hands of the educational authorities and the service is for all

children in the public schools of the State except in Buffalo, New York and Rochester. In Pennsylvania the work is exclusively under the State Department of Health and affects all Second, Third and Fourth Class cities and towns. Inspection in Fourth Class Districts of Pennsylvania, those having less than 5000 population, is conducted directly from the office of the State Department through local inspectors appointed by the Secretary of Health. There are 2352 such districts, including 20,600 schools or rooms. These schools were examined in 1922 by 950 local physicians who received the following compensation: $7 for the first schoolroom in a building, and $5.50 for each additional schoolroom in said building. School nurses are appointed by the Board of School Directors. Red Cross nurses have been doing much of the work.

Inspection of First, Second and Third Class Districts is conducted under local direction. Here there has been very little uniformity of work. The extent of work accomplished in the Fourth Class Districts during the term ending 1922 is here furnished.

TABLE XXXIV.—COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF HEALTH SCHOOL DIVISION.

Total school enrollment for the State	1,800,000
School enrollment in fourth class school districts	678,410

STATISTICS OF MEDICAL INSPECTION IN FOURTH CLASS DISTRICTS.

	Pupils inspected.	Pupils treatment advised.	Treated, per cent.
School year ending June 30, 1919	393,306	267,321	20.9
School year ending June 30, 1920	483,185	339,806	22.6
School year ending June 30, 1921	546,219	379,846	28.8
School year ending June 30, 1922	534,849	370,509	29.5

Special classes for physically handicapped children are under local direction, and supervised by the Department of Public Instruction, as provided for in Section 1413 of the School Code.

TABLE XXXV.—DIVISION OF SCHOOL HEALTH. CODE FOR TABULATION OF SCHOOL MEDICAL INSPECTIONS 1921–22 (CARD NO. 105,165).

	No.	Total.	Per cent.
Number of pupils inspected		534,849	
Col. 17—0 Normal	125,295		
1 Normal unvaccinated	7,663		
Total normal	———	132,958	
2 Slight defect	31,910		
3 Treatment advised	369,981		69.1
Total defective	———	401,891	75.1

(Pupils wearing glasses were punched defective, either 2 or 3.)

TOTAL NUMBER OF DEFECTS.

(Per cent of defectives throughout this report based on "number of pupils inspected.")

Tabulation of Defects.

	No.	Total.	Per cent.
Col. 18—Pupils wearing glasses		22,995	4.3
1 Glasses, vision corrected	11,695		
2 Glasses, vision defective	11,300		
Pupils having defective vision			
Cols. 19 and 20 (1 and 2)		89,680	16.7
Total blindness, one eye (2)	1,108		
Pupils having other eye affections		4,714	0.8
Col. 21—(1 or 2) Corneal defects	596		
Col. 22—(1 or 2) Strabismus	2,576		
Col. 23—1 Blepharitis	963		
2 Conjunctivitis	472		
3 Conj. folliculosis	3		
4 Iritis	0		
5 Trachoma	49		
6 Astigmatism	55		
Pupils having defective hearing		9,947	1.4
Cols. 24 and 25—(1 and 2)		7,646	
Total deafness, one ear (2)	365		
Col. 26—(1 and 2) Otorrhea		1,936	
Pupils having defective teeth		302,176	56.4
Col. 27—1 Unclean	49,530		9.2
2 or 3 Decayed	253,638		47.4
Pupils having enlarged tonsils		164,081	30.6
Col. 28—1 Slight	80,464		
2 Serious	72,101		
3 Diseased	11,516		
Pupils having enlarged cervical glands		28,756	5.3
Col. 29—1 Slight	27,166		
2 Serious	1,590		
Pupils having obstructed nasal breathing		27,896	5.2
Col. 30—1 Slight	10,533		
2 Serious	2,714		
3 Mouth breathing	2,208		
4 Adenoids	12,441		
Pupils with subnormal nutrition		9,534	1.7
Col. 31—1 Slight	7,512		
2 Marked	1,979		
3 Rickets	43		

	No.	Total.	Per cent.
Pupils having skin diseases		3,198	0.5
Col. 32—1 Minor	1,986		
2 Eczema	569		
3 Contagious	643		
Pupils having head lice		4,333	0.8
Col. 33—1	4,333		
Pupils having deformities		3,910	0.7
Col. 34—1 Flat-foot	451		
2 Round shoulder	1,232		
3 Spine	293		
4 Cleft palate	281		
5 Others	1,653		
Pupils having nervous diseases		1,080	0.2
Col. 35—1 Nervous	837		
2 Chorea	163		
3 Epilepsy	80		
Pupils having tuberculosis		629	0.1
Col. 36—Lungs:			
1 Suspected	278		
2 Active	10		
3 Quiescent	30		
Col. 37—Glands:			
1 Suspected	177		
2 Active	17		
3 Quiescent	9		
Col. 38—Bones:			
1 Suspected	26		
2 Active	7		
3 Quiescent	14		
Col. 39—Joints:			
1 Suspected	27		
2 Active	8		
3 Quiescent	26		
Pupils having heart disease		1,047	0.1
Col. 40—1 Functional	536		
2 Organic	511		
Pupils having defective speech		2,741	0.4
Col. 41—1 Slight	2,127		
2 Marked	582		
3 Mute	32		
Pupils with subnormal mentality		2,849	0.5
Col. 42—1 Slight	2,018		
2 Moderate	584		
3 Marked	225		
4 Extreme	22		
Pupils having goiter		3,174	0.5
Col. 43—(1)	3,174		
Pupils having miscellaneous defects		55	0.01
Col. 44—1 Asthma	29		
2 Bronchitis	20		
3 Osteitis			
4 Syphilis	3		
5 Others	3		
Pupils unvaccinated		30,347	5.6
Col. 45—1+ Normal unvaccinated	30,347		

The School Medical Inspector in New York.—The law requires the employment of school medical inspectors. In a city, such inspectors must be residents of the city for which they are appointed; in a common school district, a school medical inspector need not be a resident of the town in which the district selecting him is located.

The board of education of each city is required to appoint one school medical inspector and may appoint as many additional inspectors as may be necessary for the proper enforcement of the law.

The experience of those cities which have operated school medical inspection systems shows that for the first 3000 children attending school, there should be at least one school medical inspector. There should also be at least one additional inspector for each additional 3000 children.

It is also advisable in cities of sufficient size, having from 60,000 to 100,000 population, to employ one full-time school medical inspector rather than several inspectors on part time. A full-time school medical inspector is one who devotes the regular school hours to the medical inspection work of the district.

The following table indicates, in a general way, the ratio that should exist between the number of school children and the number of school medical inspectors and nurses:

TABLE XXXVI.

Number of pupils.	Number of school medical inspectors.			Number of school nurses on full time.
	Full time.		Part time.	
1,000 to 3,000	..		1	1 to 2
3,000 to 6,000	..		1	2 to 4
6,000 to 9,000	1	*or*	2	4 to 6
9,000 to 12,000	1	*or*	2	6 to 8
12,000 to 15,000	1	*and*	1	8 to 10

In communities having less than 1000 pupils, excellent results are obtained by employing a school nurse who directs most of the health work under the supervision of the school medical inspector.

The board of education in a union free school district is required to appoint one school medical inspector. In such districts, having a population of 5000 or less, but one such inspector may be appointed. If the population of such district exceeds 5000 such additional inspectors may be appointed as are necessary for the proper enforcement of the law.

The trustees of a common school district are required to employ a school medical inspector to examine the children attending the school in such district. The trustees of two or more districts may unite in the employment of the same inspector. When such joint employment is made, the expense must be apportioned among the districts according to the assessed valuation of their taxable property.

In a rural school district or a village where it is not feasible to employ a full-time inspector, it is suggested that the compensation of the inspector be made, not on the basis of the number of children examined, but according to the time devoted to work for the school authorities. Where, however, the school medical inspector's salary is not arranged on this plan, the amount paid for each pupil should vary according to the number of children to be examined, the distances which inspectors are required to travel, the general accessibility of school-houses, etc. The compensation should not exceed $1 for each pupil and in many districts should be less.

Where part-time school medical inspectors are employed, definite hours of service should be stated and regular reports required as to services rendered. The district should contract for a definite number of hours with specified duties prescribed, as in the following contract:

Suggested Contract Between Boards of Education or Trustees and School Medical Inspector.—The undersigned, parties of the first and second part respectively, hereby mutually agree to the following terms and conditions:

In consideration of the performance of the duties of the school medical inspector, as hereinafter provided, by

Dr.....in school district No.....,
city or town of ....., county of.....,
the trustee, or board of education, of said district agrees to pay the said Dr.....the sum of.....when such services have been rendered by said school medical inspector to the satisfaction of and as required by the trustee or board of education of said district.

The services to be rendered by the school medical inspector under this contract are found on the opposite side hereof and become a part of this agreement.

Signed in the presence of each other....., 192.....

.....
For board of education or trustee.

.....M.D.
School Medical Inspector.

The opposite side of this contract contains the following:

Duties of the School Medical Inspector, to be Prescribed by Board of Education or Trustee.—1. To make a careful physical examination within sixty days after the opening of school of those pupils of the district who do not present a reliable health record for the current year.

2. To make an intensive physical examination of and recommendations for the mentally retarded children, the undernourished children the cardiac children, the the children with postural or orthopedic defects, candidates for athletic contests and such other special cases as may be brought to his attention.

3. To unite with teachers, principals and nurses in recommending to parents and guardians the correction of such existing defects, as in the opinion of the medical inspector may interfere with the health of children or with their progress in school.

4. To make careful physical examinations of the teachers and janitors of the school, and to report if requested, to the trustee or board of education, such defects as may be found, together with recommendations for treatment or relief.

5. To inspect the school buildings and grounds at least twice each year or upon special request, and to report in writing to the trustee or board of education any conditions found which may, in the opinion of the medical inspector, tend to endanger the health of the pupils, or to impede their progress in school.

6. To lend every possible assistance and coöperation to physical directors, school nurses, dentists, dental hygienists and other health workers, engaged in school health service in the city or district.

7. To coöperate with teachers and local health authorities and physicians in promptly recognizing and suppressing any communicable disease or condition which may appear in the school or in the community.

8. To study the medical inspection work in the district throughout the school year and to advise and assist in its administration in such manner as will best accomplish the intent of the law.

9. To perform such other duties as the law may require, or as may from time to time be directed by the trustee or board of education, for the purpose of conserving the health of the children of the district, or improving the sanitary condition of the buildings or grounds.

10. To refrain from practising medicine among children examined except in families regularly attended by the school medical inspector.

Superintendents and trustees are expected to select only those physicians who are competent to render these services.

The law provides that the school medical inspector shall be a physician, legally qualified to practice medicine in New York State, and with a record of two years of medical practice immediately preceding his appointment as school medical inspector.

Within the limitations above specified, the general intent of the law is that school authorities in the employment of school medical inspectors and school nurses shall possess

powers similar to those which they possess in the employment of teachers. Boards of education or trustees employing such inspectors and nurses possess the absolute power to fix the compensation which these employees are to receive. When a health officer is employed, he is to receive compensation for his services. He derives his instructions from the educational authorities and must submit his reports to the same. The salary which he receives as health officer does not include his compensation for the services he renders as school medical inspector. The town or village board of health has no function to perform in appointing school medical inspectors, prescribing their duties, or in otherwise enforcing the law.

The School Nurse.—The law authorizes the employment of school nurses in all the schools of the State. They must be registered nurses and licensed to practice as such. As a rule, there should be not more than 2000 school children under the care of one school nurse, and for each additional 1500 children there should be one additional school nurse employed. School nurses are to give their full time to the work under direction of the educational authorities of the district or districts employing them. They shall aid the school medical inspector and perform such work as he may delegate to them.

The trustees or boards of education of two or more districts may unite in employing the same school nurse and in paying the expense thus incurred in proportion to the assessed valuation of taxable property in the several districts.

In small communities, where the school medical inspector visits the school infrequently, it is very advantageous to delegate most of the health service to the school nurse, who acts under direction of the school medical inspector and summons him to her assistance when necessary to carry out the provisions of this law.

Registered nurses who have completed a course approved by the State Department of Education in physical training,

have been granted in some cases a temporary license to supervise and instruct in physical training. These nurse-physical trainers have been found particularly valuable in rural communities, combining the services of the school nurse with those of the physical trainer. In such instances, the State pays a part of the salary of the nurse-physical trainer in proportion to the amount of her time devoted to the duties of physical trainer. Where nurses or nurse-physical trainers are employed they should make regular monthly or bi-monthly reports to the school authorities employing them as to services rendered.

A nurse possessing the following qualifications, or their equivalent, may upon presentation of such evidence to the State Commissioner of Education be designated a health teacher:

(*a*) Possession of credentials showing the completion of an approved four-year high school course.

(*b*) Registration as a registered nurse in New York State, or its equivalent.

(*c*) Possession of credentials showing the completion of at least six semester hours in physical education or general public health service.

In order that the full requirements under (*a*) may not be of immediate embarrassment it is required that, in addition to the professional requirements, on or after September 1, 1922, all appointees shall be required to have had two years of high school work, on and after September 1, 1923, all appointees shall be required to have had three years of high school work, and on and after September 1, 1924, all appointees shall be required to have completed an approved four-year high school course.

For the current school year (1920–21), satisfactory evidence of successful experience for at least one year as a nurse in school or other public health service may be accepted in lieu of (*c*).

Limited licenses may be issued for a period of three years.

During this period health teachers who otherwise qualify but have had not more than six semester hours of special training in school health service must complete additional approved courses to the extent of one summer's work, or six semester hours. At the end of this limited period, on proper evidence of the completion of the required professional work and at least two year's successful experience, the certificate may be renewed on the same basis as other special certificates issued by the Department.

Trustees and boards of education employing nurses as health teachers are entitled to the same quota of State funds as for any other elementary teachers regularly employed in their schools.

No special certificate shall be granted, even though it be earned, except at the request of a city, village or district superintendent after the applicant shall have been assured of a position to teach.

TABLE XXXVII.—RESULTS OBTAINED IN FOUR YEARS IN NEW YORK STATE.

	In cities and large villages.	In rural schools.	Total.
Number of physical examinations	896,907	856,523	1,753,430
Defects found	645,663	748,225	1,393,888
Defects corrected	239,347	170,813	410,160
Percentage treated	37.0	22.8	
Defective vision	..	..	141,574
Percentage treated	..	..	38.5
Defective hearing	..	..	29,216
Percentage treated	..	..	24.6
Nasal breathing	..	..	119,174
Percentage treated	..	..	17.3
Hypertrophy and diseased tonsils	..	..	309,510
Percentage treated	..	..	12.5
Defective teeth	..	..	558,362
Percentage treated	..	..	32.4
Defective heart	..	..	18,629
Percentage treated	..	..	26.8
Pulmonary conditions	..	..	6,756
Percentage treated	..	..	43.0
Defective nutrition	..	..	52,996
Percentage treated	..	..	33.6

The University of the State of New York—The State Department of Education.

School Medical Inspection Report.

SUMMARIZED REPORT FOR EACH YEAR, FOR SIX YEARS AND FOR A SIX-YEAR PERIOD ENDING JULY 31, 1921.

The following summarized report recently submitted to the Commissioner presents some of the results that have been accomplished in school medical inspection during the past six years.

The report speaks for itself and ought to be interesting not only to school authorities but to people in general.

Table XXXVIII.—Total Number of Registrations of Pupils Reported by Years and in the Six-year Period.

Year.	In cities and large villages.	In rural schools.	In all schools.
1915–1916	249,339	75,165	324,504
1916–1917	289,662	255,683	545,345
1917–1918	304,565	278,336	582,901
1918–1919	327,162	242,352	569,514
1919–1920	361,282	303,384	664,666
1920–1921	388,220	339,184	727,404
Total	1,920,230	1,494,104	3,414,334
Average	320,038	249,018	569,056

Table XXXIX.—Percentage of Registered Pupils Examined each Year and During the Six-year Period.

Year.	In cities and large villages.	In rural schools.	In all schools.
1915–1916	69.90	78.80	71.99
1916–1917	65.20	81.00	72.75
1917–1918	79.40	74.50	77.10
1918–1919	70.50	82.30	75.57
1919–1920	65.00	79.70	71.63
1920–1921	70.07	82.64	75.93
Average	69.95	80.00	74.35

Table XL.—Total Number of Pupils Examined by Physicians each Year and During the Six-year Period.

Year.	In cities and large villages.	In rural schools.	In all schools.
1915–1916	174,337	59,281	233,618
1916–1917	189,050	207,711	396,761
1917–1918	241,843	207,598	449,441
1918–1919	230,856	199,544	430,400
1919–1920	235,158	240,975	476,133
1920–1921	272,045	280,311	552,356
Total	1,343,289	1,195,420	2,538,709
Average	223,882	199,237	423,119

Table XLI. — Total Number of Physical Defects Found Among School Children each Year and for the Six-year Period.

Year.	In cities and large villages.	In rural schools.	In all schools.
1915–1916	131,431	36,644	168,075
1916–1917	166,097	176,229	342,326
1917–1918	138,093	177,063	315,156
1918–1919	154,665	174,180	328,845
1919–1920	186,808	220,753	407,561
1920–1921	244,563	291,636	536,199
Total	1,021,657	1,076,505	2,098,162
Average	170,276	179,418	349,694

Table XLII.—Total Number of Physical Defects Corrected or Treated by Years and in the Six-year Period.

Year.	In cities and large villages.	In rural schools.	In all schools.
1915–1916	32,632	5,455	38,087
1916–1917	49,979	34,431	84,410
1917–1918	46,421	38,684	85,105
1918–1919	58,433	40,701	99,134
1919–1920	84,514	56,997	141,511
1920–1921	129,710	80,034	209,744
Total	401,689	256,302	657,991
Average	66,948	42,717	109,665

TABLE XLIII.—PERCENTAGE OF DEFECTS CORRECTED OR TREATED BY YEARS AND DURING THE SIX-YEAR PERIOD.

Year.	In cities and large villages.	In rural schools.	In all schools.
1915–1916	24.80	14.80	22.66
1916–1917	30.00	19.90	24.65
1917–1918	33.60	21.80	27.00
1918–1919	37.70	23.30	30.14
1919–1920	45.20	25.80	34.72
1920–1921	53.00	27.40	39.11
Average	39.31	23.80	31.36

RURAL SCHOOL SANITATION.

Rural school sanitation marks the greatest difference in responsibility given to urban and rural medical officers. Small towns and villages are handicapped with a lack of finances. It is not always ignorance of the needs nor the lack of desire to give the best but no means of raising the necessary funds. It is useless for a State to pass drastic laws prescribing ideal school houses unless it furnishes the money to carry the plans into execution. While school architecture has made wonderful progresses in the past decade, little attention is paid to the practical application of these principles to the little village who can utilize but one or two class-rooms. Building laws are so variable and contradictory that one often wishes for a codification of these laws and an attempt at uniformity throughout the country. There must be some variation in different sections, according to climate, environment and kind of school needed, yet certain health principles and methods of applying them must be common to all sections.

There should be recorded in the central office of the department in authority a complete detailed description of each school, together with plans of construction of the building and grounds. The medical officer each year or more often if found necessary, should furnish the authorities

with a sanitary survey which should include all the data found in the blank forms described in an earlier section. Overcrowding of class-rooms; heating and ventilation; desks and other equipment; toilets and urinals water-supply; fire hazards water-supply; cleanliness; grounds. The greatest problem in rural districts is that of toilets. The author believes he will render most service by reproducing the pamphlet furnished for the State of Pennsylvania by Dr. Charles H. Miner, Secretary of Health.

COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF HEALTH.
SANITARY INSPECTION OF SCHOOL BUILDING.

.....School Building ..... { City / Borough / Township

.....County, ... 192.....

To the Board of School Directors:

Your attention is respectfully directed to conditions requiring improvement at the above named building as indicated by notations in the following report:—

ROOMS (Designate rooms by grades or room numbers for multiple room buildings)

Overcrowded, less than 200 cu. ft. air space per pupil in .....rooms.

Additional light area should be provided in .....rooms
(Glass area shall equal 20% of floor surface)

Pupils' desks directly face incoming light in.....rooms
(This condition requires an immediate remedy)

Light or buff colored window shades required for..... rooms.

Walls and ceiling require painting or calcimining in .....rooms.
(Light green-gray, or light buff with white or ivory ceiling is recommended)

Better blackboards should be provided for.....rooms

Some pupils' feet do not touch the floor when seated in .....rooms.
(Adjustable single seats and desks should be provided)

Good thermometers are required for.....rooms.

HEATING AND VENTILATION (X indicates conditions requiring attention)

Stove jackets are required under Section 619 of School Code for ordinary stoves.....

(Modern, jacketed, ventilating heaters or cellar furnaces should replace ordinary stoves)

Outside fresh-air ducts should be provided to stoves or radiators.....

(Such ducts or the use of window boards, required by law)

If common stoves, or direct steam or hot-water heat continues in use, window ventilating boards are required under Section 620 of School Code.....

Windows must be made to permit lowering from the top .....

Provisions for supplying moisture to heated air are required.....

Present heating system needs repairs.....

*Better heating and ventilating system required.....

Outside fresh-air ducts are required to cellar furnace .....

Outside intakes to air ducts must be kept open continuously during school hours.....

Ducts for the exit of foul air should be provided.....

BUILDING (X indicates conditions requiring attention)

The following repairs are required.....

.....

.....

.....

.....

(Note walls, doors, windows, floors, etc.)

A new building with modern equipment should be provided.....

School rooms require more careful cleaning.....

Halls and cloak rooms require cleaning.....

Floors require oiling with good floor oil.....

* Furnaces recirculating and reheating school-room air or the "Pipeless" furnace cannot legally be used for school-room heating.

Oiled sawdust or sweeping compound is required for use in sweeping.....

Furniture requires dusting daily with a moist or oiled cloth.....
(Dry dusting is forbidden)

Iron fire escapes are required.....
(For two- or three-story building)

Fire drills should be regularly conducted.....

Exits must be kept free from obstruction.....
(Doors must open outward)

A First-aid cabinet should be provided.....

.....

WATER SUPPLY

Spring, well, or cistern requires protection against surface drainage.....

A safer water-supply should be provided.....

A covered water container with spigot, or bubbling drinking fountain is required.....

The use of the common drinking cup must be absolutely abolished.....
(Individual cups kept in a closed case or bubbling fountains attached to supply-pipe faucets should be provided)

The use of a common towel is illegal.....
(Paper towels or other individual towels must be used only)

GROUNDS

Larger play grounds should be provided.....
(At least an acre of ground should be provided)

School grounds require better drainage.....

TOILETS

Toilets require immediate cleaning.....

Toilets require immediate repairs.....

Flush Closets

Toilet fixtures must be properly trapped

.....

Proper vent pipes must be connected to toilet fixtures.....

Outside Privies

*Proper screens and boys' outside urinals are required.....

(Non-flushing inside urinals are to be condemned)

*Fly proof, concrete toilet vaults should be constructed.....

(Surface water must not be permitted to drain to privy vaults)

Privy vaults require emptying and cleaning.....

Lime is required for weekly use over privy vault contents.....

Remarks:

.....M.D.

Inspector.

☞The Medical Inspector of School is required to inspect sanitary condition of buildings, outbuildings, water supply, etc., and enforce sanitary requirements. Section 1506, School Code.

Sanitary School Toilets for Rural Districts.—*Flush Closets.*—The water-carrier or flush-closet system is the most practical toilet system for either home or school, and with the perfection of the air-pressure domestic-water systems (Pneumatic or Hydro-Pneumatic Systems) now in practical use in many rural homes this type of closet is no longer an impossibility even for the rural school. A number of rural school districts have solved the water-supply and toilet question by the installation of these air-pressure systems operating from drilled wells located on the school premises. The installation of such systems, at least for all consolidated schools, is strongly recommended to school districts having no available public water-supply. For towns having a public water-supply no toilet system other than flush closets should be considered.

Septic Tanks.—The installation of a double chamber septic tank with automatic siphon and provided with an underground or sub-surface disposal field of agricultural tile,

* Sketch of approved outside toilet will be furnished upon request to State Department.

laid with open joints, is the most satisfactory means for sewage disposal from a flush-closet system where no public sewer system is available. It must be borne in mind that the septic tank will not destroy the excrement, it simply liquifies or dissolves it, thus facilitating its disposal. The dissolved organic waste contained in the effluent from the septic tank is in a highly putrescent state and in addition may contain germs of typhoid or other intestinal diseases. Proper precautions must, therefore, be exercised in the disposal of the effluent liquid. *It must never be discharged upon the surface of the ground, into a gutter or a dry ditch, nor into a stream.*

Chemical Toilets.—Inside chemical closets may be installed after specific approval of plan has been secured from the Department of Public Instruction. If installed in suitable compartments properly separated from recitation or class-rooms, these toilets have a decided advantage over the outside privy in that the teacher can have direct supervision and control. They will, however, require weekly cleansing of the closet bowl to prevent them from becoming odorous and a menace in the school building.

Requirements for the Installation of Chemical Toilets in Pennsylvania School Buildings.—Entrance.—Doors shall not open from the class-room directly into the toilet-room. A *separate ante-room or toilet vestibule* must be provided to each toilet. In buildings of more than one room where toilets are entered from a hall or main entry used by both sexes, if space or lighting conditions do not permit of separate ante-rooms, proper stalls or screens shall be provided for each seat.

In *one-room buildings* to afford closer supervision, entrance to *toilet ante-rooms* shall always be provided from *class-room, not* from the main entrance vestibule.

Partitions extending from *floor to ceiling, lathed* and *plastered* on both sides, or a masonry wall, must be provided between toilet-rooms and ante-rooms, as well as between class-room and ante-room. Doors between toilet and ante-

room and between ante-room and class-room must fit tightly and shall not be directly opposite each other. Slat or short length doors are not permitted.

Space Required.—Three (3) feet wide by five (5) feet long is recommended for the toilet-room. Ante-room or toilet vestibule at least of equal size. Cloak-rooms, if used separately by each sex, may serve as toilet ante-rooms, but *no toilet shall be placed directly* in a *cloak-room*. If a cloak-room is used as an ante-room to the toilet, the minimum size of the cloak-room is to be five (5) feet in width and of proportionate length.

If the school-room has no cloak-rooms and is thirty-six (36) feet in length or more, five (5) feet may be taken off the front of the room for cloak-rooms and toilet-rooms.

If the school-room has no cloak-rooms and is less than thirty-two (32) feet in length, the cloak-room (ante-room) and toilet-rooms must be built on to the building.

Windows.—Toilets and ante-rooms shall be provided with proper light and ventilation. *Toilet window sills* must be five (5) feet from floor.

When the installation of toilets with ante-rooms or cloak-rooms takes away from the class-room one or more windows, the same number of new windows must be put in the class-room to make up for the loss of light. Cloak-rooms must have one or more windows.

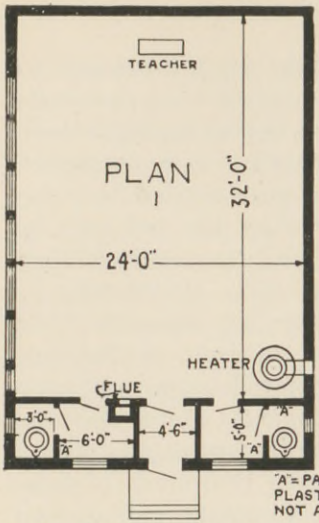
Non-flushing inside urinals are not approved by the Department. *Suggestive plans for installing inside toilets in one-room school buildings.*

Separate ante-room entrance is required to each toilet as shown above.

These plans also show proper window arrangement for school rooms.

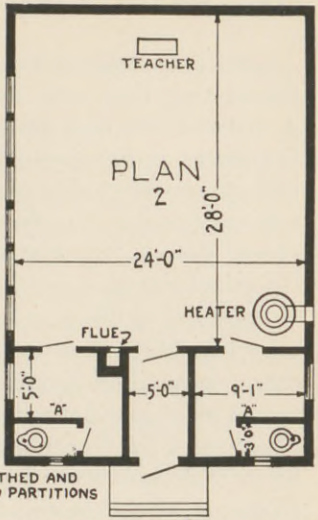
Vent Pipes.—Each toilet bowl shall be provided with a four (4) inch pipe extending above the roof of building and provided with an approved suction draft ventilator top. Vent pipes are not permitted to connect with the chimney flue.

PLATE 4-SH

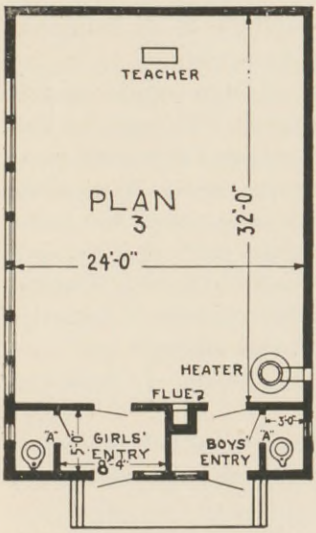


"A" = PARTITIONS LATHED AND PLASTERED. BOARD PARTITIONS NOT APPROVED.

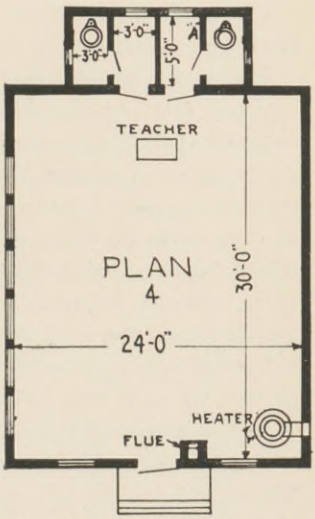
CLOAK ROOM INSTALLATION-A



CLOAK ROOM INSTALLATION-B



SEPARATE BOYS AND GIRLS ENTRY TO BUILDING.



ADDITION BUILT FOR TOILETS ONLY. BILATERAL LIGHTING OF SCHOOL ROOM.

FIG. 77

Chemical Tanks.—Tanks of ample size are required so placed that they may readily be emptied when necessary. A three-or four-inch drain pipe from the bottom of the tank leading to an inderground leaching pool or to an absorption bed of open joint agricultural tile is recommended for draining such tanks. Leaching pool or absorption bed must be placed fifteen (15) feet or more from the school building. Chemical closets using pails or cans will be condemned.

Approval of Plans.—Detailed floor-plan drawings of the school building showing location of windows, cloak-rooms, entrance vestibule and plan of the new toilet-rooms and anterooms *must be submitted in triplicate to the Bureau of School Buildings, State Department of Public Instruction, for approval before installations can legally be made.* Dimensions of classrooms, cloak-rooms and toilet-rooms must be indicated on the plans; also position and run of vent pipes and stacks.

Separate stairways for each sex are required in basement installations.

Chemical toilet installations in multiple room buildings shall be limited to the first floor or basement.

Standard (Outside) School Privies.—A large number of the isolated one- or two-room rural schools still hold to the ordinary privy or out-house. The ordinary privy set over an excavation in the soil is dangerous because of possible contamination of water-supplies and exposure of the feces to flies, allowing them to breed there and carry typhoid and other disease germs throughout the neighborhood. Experience, however, has shown that the ordinary privy, if properly constructed, can be kept safe, clean, and sanitary.

Requirements for Standard School Privies.—1. Separate privies for each sex, 50 feet apart.

2. Concrete privy floor and vault (earth bottom to vault).

3. Seven-foot screen, shielding privy entrance and boys' urinal.

4. Boys' urinal trough within outside screened enclosure.

5. Six-inch vent shaft (inside dimensions) from vault to roof.

6. Fly-proof hinged lids on seats and on rear vault extension.

7. Weekly use of lime over vault contents.

Number and Size.—Separate out-houses are required for each sex. They shall (where the ground is at all available) be at least 50 feet apart and a similar distance from the school building, within view from school-room windows if possible. For the ordinary one-room school each privy shall be $4\frac{1}{2}$ feet square; this will accommodate from 20 to 25 pupils of either sex. When the number of either sex exceeds 25, extra compartments shall be provided for each additional 25 pupils or fraction thereof. The ordinary privy should not be considered for school buildings of more than four rooms.

Privy Floor and Vault.—The privy floor and vault shall be constructed of concrete. Concrete vault to extend 11 inches higher than the privy floor, forming the toilet seat, seat board of $1\frac{3}{8}$ inch white pine or cypress 21 inches wide to be bolted on the concrete end-walls of the vault, with bolts imbedded in the concrete. The vault shall have a depth of 21 inches below the floor line (2 feet 8 inches from seat board) and is to extend 22 inches to the rear of the privy to permit of easy access for cleaning. Vaults shall not be deeper than here specified because of difficulty in cleaning them; the annual cleaning of privy vaults is a requirement of the School Code. The vault extension slopes to within 4 or 5 inches of the ground line and shall be covered with a hinged fly-proof lid securely closed with a padlock. Rear end of vault must always be of sufficient height above the ground line so as to prevent surface water from draining into the vault.

Spring or Well.—The above privy should not be placed within 150 feet of any spring or well. If impossible to locate at this distance from a spring or well, the privy vault in all such cases must be built with water-tight concrete bottom 6 inches thick.

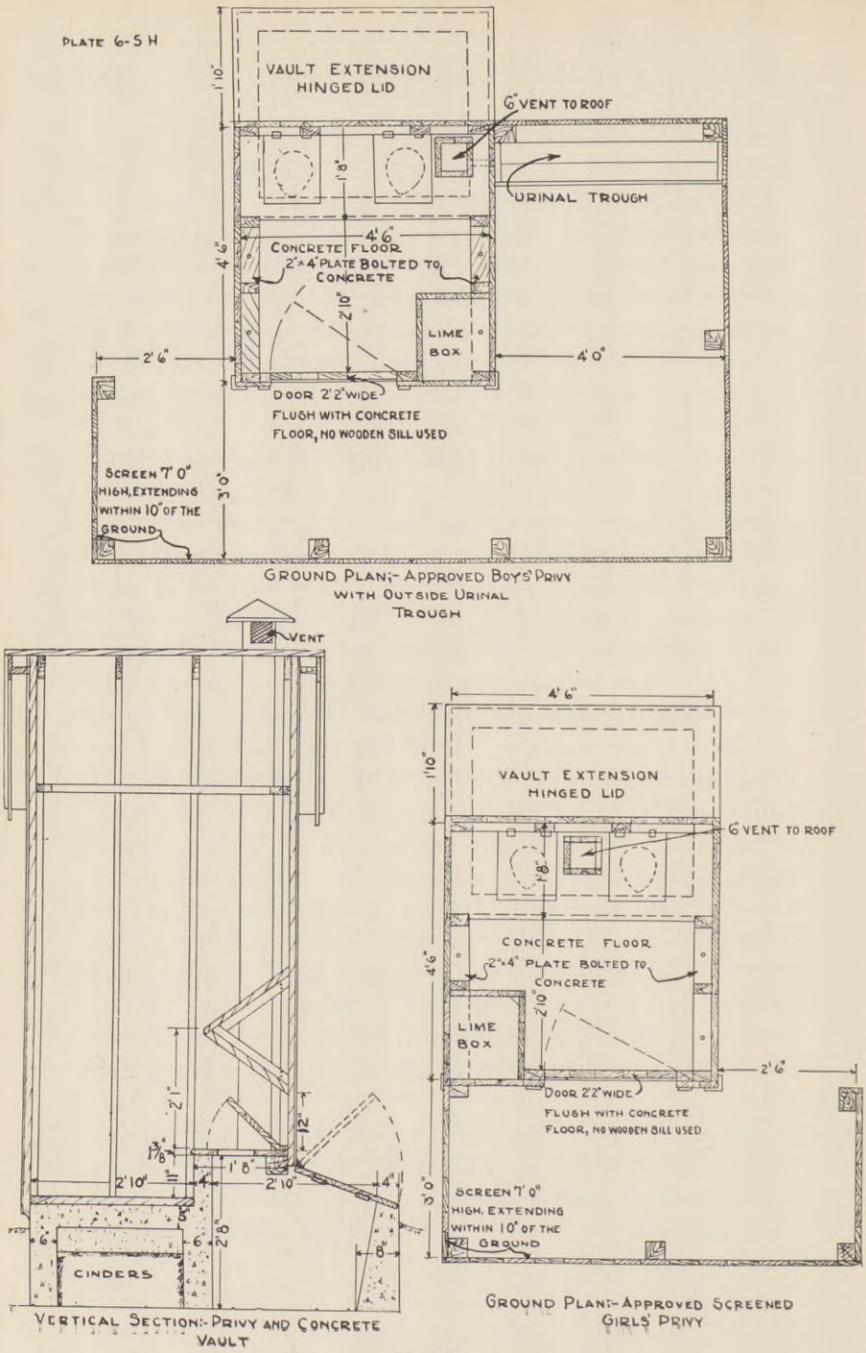
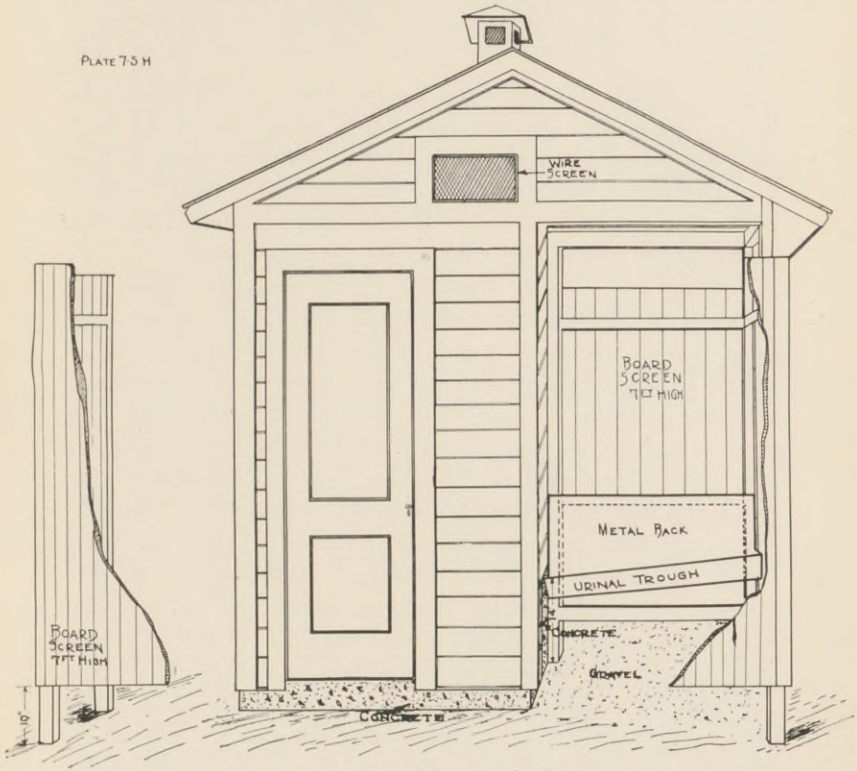


PLATE 6-5 H
VAULT EXTENSION
HINGED LID
6" VENT TO ROOF
URINAL TROUGH
1'10"
1'8"
4'6"
4'6"
CONCRETE FLOOR
2"×4" PLATE BOLTED TO CONCRETE
2'10"
LIME BOX
2'6"
4'0"
DOOR 2'2" WIDE
FLUSH WITH CONCRETE
FLOOR, NO WOODEN SILL USED
SCREEN 7'0" HIGH, EXTENDING WITHIN 10" OF THE GROUND
3'0"
GROUND PLAN:- APPROVED BOYS' PRIVY WITH OUTSIDE URINAL TROUGH
VENT
2'1"
12"
1 3/8"
1'8"
2'10"
11"
4"
2'10"
4"
6"
6"
2'8"
8"
CINDERS
VERTICAL SECTION:- PRIVY AND CONCRETE VAULT
4'6"
VAULT EXTENSION
HINGED LID
6" VENT TO ROOF
1'10"
1'8"
4'6"
CONCRETE FLOOR
2"×4" PLATE BOLTED TO CONCRETE
LIME BOX
2'10"
2'6"
DOOR 2'2" WIDE
FLUSH WITH CONCRETE
FLOOR, NO WOODEN SILL USED
SCREEN 7'0" HIGH. EXTENDING WITHIN 10" OF THE GROUND
3'0"
GROUND PLAN:- APPROVED SCREENED GIRLS' PRIVY

FIG. 78

Fig. 79 shows the arrangement of the metal urinal trough within the outside screened enclosure at the boys' privy. (22 inches from the ground at the outer end and 14 inches at the lower end where it enters the concrete end



SCREENED BOYS' PRIVY

FIG. 79

wall of the vault, directly below the seat board.) The privy roof extends across the screened side enclosure directly in front of the urinal trough. There is to be an open space between the top of the screen and the square of the roof, as shown in Fig. 79. In the boys' privy the vent shaft (6 inches

by 6 inches inside dimensions) is placed to the side in order that it may extend directly through the ridge of the roof. (See Fig. 79 Boys' Privy.)

In the girls' privy the vent shaft is placed in the center of the rear privy wall in order to permit a similar extension through the ridge of the roof. (See Fig. 78—S H Girls' Privy.)

Wet Ground.—Where school privies have to be located in low or soggy soil the concrete vault should be raised well above the surface of the ground with concrete steps to the privy entrance, bottom of privy vault not more than 6 inches below the general surface. If the vault is sunk into wet soggy soil it will fill up with water by percolation.

Screens and Boys' Urinal.—Privy entrances must be enclosed or shielded with a tightly boarded screen 7 feet high extending to within 10 inches of the ground, constructed as shown in Figs. 78, 79. At the boys' privy this screen shall also extend along the side of the privy with a metal or concrete urinal trough along the rear of the screened side enclosure. This urinal shall be 22 inches above the ground at the outer end and 14 inches at the inner or lower end where it discharges into the concrete vault directly below the seat board. Urinals must never discharge on the surface of the ground. (Urinal troughs inside of privy not permitted.) The toilet-room shall extend across that part of the screened enclosure directly in front of the urinal. (See Fig. 78.)

Ventilation.—Each privy shall be provided with a vent shaft or duct (6 inches x 6 inches inside dimensions) extending from the vault to and above the roof for the escape of offensive odors. (Fig 78.) An opening for ventilation shall also be provided in the gable end of the privy above the door. This opening shall be covered with copper fly screening on the inside and protected with square mesh galvanized wire on the outside.

Seat Covers or Lids.—Each seat is to be provided with a hinged lid closing automatically when seat is not in use, so

constructed as to absolutely prevent flies from entering the vaults during fly season. A triangular extension formed of two boards running lengthwise along the inside of the privy directly above the seat shall be provided in order to prevent pupils from standing on the toilet seats. (See "Vertical Section" Fig. 78 for details.) This extension also acts as a stop for the lids causing them to close automatically when seat is not occupied.

Lime Box.—A box or container shall be built in one corner of the privy and a supply of dry slaked lime or dry earth kept therein. The janitor or teacher shall be required to cover the excreta in the vaults at least weekly with lime or dry earth.

Painting and Rough Sanding.—Privies and screens shall be painted inside and outside and rough sanded to prevent obscene writings and drawings.

Lock.—The privy door shall be provided with a substantial rim lock and the teacher required to keep privies locked during other than school hours.

The law requires privy vaults to be cleaned and disinfected prior to the opening of each school term and oftener if necessary. The excreta when removed shall be promptly buried or properly distributed on farm land and immediately plowed under the top soil.

Regular Cleansing.—The interior of the privies shall be scrubbed at least once each month during the school terms with soap and water to which has been added 5 tablespoonfuls of cresols to the gallon of water. School boards should provide janitor service for this work and for the daily cleaning of the school-rooms. Part time janitor service for the one or two-room school buildings is an essential school requirement. Toilets or out-buildings should, however, be *daily inspected by the teacher,* and should be kept clean and absolutely free from all defacing and obscene marks.

REGULATIONS OF THE ADVISORY BOARD OF THE STATE DEPARTMENT OF HEALTH, ADOPTED APRIL 4, 1923.

ARTICLE II.—SECTION 1. No privy, cesspool or other receptacle for human excrement shall be constructed, maintained or *used so that flies have or may have access to the excrementitious matter contained therein.*

SECTION 2. No privy, urinal, cesspool or other receptacle for human excrement shall be constructed, maintained or used which *directly* or *indirectly drains* or *discharges* over or *upon the surface* of the *ground* or into any waters of the State.

SECTION 3. All privies, urinals, cesspools or other receptacles for human excrement shall be cleansed at sufficiently frequent intervals to prevent the contents from overflowing.

ARTICLE IV.—SECTION 1. No person shall maintain or permit to be maintained any pond, privy vault, cesspool, well, cistern, rain barrel, or other receptacle containing water in such a condition that mosquitos breeding therein may become a public nuisance.

Act of April 27, 1905.—"SECTION 16. Every person who violates any order or regulation of the Department of Health, or who resists or interferes with any officer or agent thereof in the performance of his duties in accordance with the regulations and orders of the Department of Health, shall be deemed guilty of a misdemeanor, and shall, upon conviction thereof, be punished by a fine of not more than $100, or by imprisonment not exceeding one month, or both, at the discretion of the court."

School-room Ventilation.—*Window Boards.*—Section 620 of the School Code requires that every school or recitation room shall be provided with ample means of ventilation, and that where windows are the only means of ventilation they shall permit opening from top and bottom. Each window shall be fitted with a shield or board inside of the opening to protect pupils from direct currents of cold air. This shield shall consist of an 8-inch board, or of ⅜-inch wire

glass 8 inches wide, set at a slight angle inside of the sash along the base of the window.

Vapor Pans.—Every school-room heater or hot-air furnace shall be provided with a vapor pan of adequate size which shall be kept continuously filled with water. Rooms heated with direct steam radiators shall be provided with narrow vapor tanks that may be hung against the side of the radiator columns. This type of vapor pan shaped to fit to radiator columns, may be secured through school supply houses.

For large hot-air systems shallow vapor tanks holding from 10 to 20 gallons should be placed in the warm-air chambers above the furnace or at the base of the main warm-air duct. With indirect steam systems similar tanks should be placed directly back of the first stack of radiators (the tempering radiators).

Fresh-air Ducts.—Rooms heated with common stoves or with direct steam radiators should be provided with cold-air ducts or inlets admitting fresh outside air directly through the school-room walls and entering underneath or at the side of the stove inside of the jacket; with steam heating, underneath the radiators.

Foul-air Exit.—Every school-room should be provided with an adequate ventilating flue or duct, connecting or running parallel with the chimney flue and having an opening near the floor of the room for the exit of foul air. The best heating and ventilating system for one- or two-room schools is the *jacketed ventilating room heater* placed in a corner of the room and provided with special fresh-air inlet and a duct with opening near the floor of the room for the exit of foul air.

Indirect Heat.—For buildings of more than two rooms, and even for certain two-room buildings, a basement furnace with adequate fresh-air duct leading from the outside basement wall to the base of the furnace should be provided. Large modern buildings are most economically heated by a com-

bination of direct and indirect steam, indirect steam radiators in the basement to heat the incoming fresh air for ventilation of rooms, and direct radiation in the rooms for additional heat.

Basement air ducts or air chambers shall be tightly constructed so as not to admit cellar air. The interior of such air chambers and fresh-air rooms must be kept free from rubbish or dirt, and white-washed at the beginning of each school year. Basement fresh-air windows or inlets shall be kept open continuously during school hours.

Warm-air Ducts.—The heated air from a basement furnace or from indirect steam radiators (basement radiators) should be brought to the rooms through wall flues, and admitted through side wall registers 8 feet above the floor. The use of floor registers is condemned because of the collection of dirt in the air chambers beneath such registers.

The opening into the foul-air exit duct should always be at the floor on the same side of the room as the warm-air inlet register. No indirect heating system shall be operated without the required foul-air exit ducts, and the necessary mechanical means for removing foul air (Stack heater, or steam coils in foul-air shaft, or a plenum fan).

Pipeless furnaces or furnaces recirculating school-room air exclusively cannot legally be installed in any school building.

Window Shades.—*Color and Method of Installation.*—Window shades of light weight translucent material, light buff or straw color, should be used. Double shades for each window are the most practical. Have both rollers set at the middle of the window so that for the lower half of the window the shade is drawn downward and for the upper half the shade is drawn upward by means of cord and self-locking pulley.

If a single shade is used, it should be set at the base of the window drawing upward with cord and self-locking pulley. Shades hung from the top of the windows interfere with window ventilation and continually obstruct incoming light

at the point most valuable for diffusion through the room. A square foot of light admitted near the ceiling has four times the illuminating value of light admitted at the base of a window.

SAFETY FIRST AND ALWAYS.

Every year in every city hundreds of people are killed and thousands injured by accidents which are in most part preventable. No small proportion of these cases are children. The increase of the automobile and high-powered cars has increased the hazard. Philadelphia has in operation a campaign which may serve as an example of possibilities in the methods for lessening these accidents. The Rapid Transit Company in coöperation with a Citizens Safety Committee enlisted the service of the boy scouts and the Safety Patrol—a highly organized corps of school boys who protect the children coming to and from the schools.

Automobilists and all motormen on the cars were enlisted in a pledge to safety. A small insignia was given to each one enrolled to display on the vehicle.

The Safety Pledge.

In presenting this application for membership in the Citizens' Safety Committee, I solemnly pledge—

1. That I will so conduct my work each day, in whatever occupation or industry I may be engaged, as to protect myself and my fellow workers from possible harm, injury or accidental death.

2. That I will exercise all caution in driving about the public streets, or in walking across streets, to the end that neither myself nor others shall be subjected to any avoidable danger.

3. That I will earnestly try to safeguard children from possible harm, whether in the home or on the street, and both by good example and kindly advice seek to teach them to be watchful of the safety of themselves and others.

The traffic in cities is yearly becoming a greater problem. Children take great chances and few police departments are equipped to station officers at all corners where needed. Drivers may be reckless or defective vision may blur things

and prevent clear views. Rain, sleet, snow and washed streets add to the dangers.

The Philadelphia Rapid Transit Company employs a capable energetic woman (Miss Roadifer) to direct this great campaign. She is known to the school children as "Miss Safety First."

This corps of safety patrol consists of older boys chosen in each school and empowered to direct traffic in front of the school and at nearby crossings. These boys are furnished with a felt band insignia to be worn around their arms. Nothing pleases a boy more than being vested with authority and the interest taken by most of these protectors is amazing. They are furnished with uniform instructions, receive training in safety measures, and their interest is maintained by gatherings and entertainments as well as rewards for special service.

"PHILADELPHIA SAFETY PATROLS UNDER THE DIRECTION OF MISS SAFETY-FIRST OF THE PHILADELPHIA RAPID TRANSIT COMPANY.

"The Safety Patrols were tried out as an experiment in but a few schools during 1915–1916 but proved so effective that today we have about 60 public schools each with an organization striving to excel the others.

"There are two divisions of the organization, namely, the 'Senior Division' and the 'Junior Division.' In schools which have eight grades, the members of the squad are chosen from the seventh and eighth grades; schools going only to the sixth grade have their members chosen from the highest sixth grade. In both divisions, however, the members are chosen for meritorious standing in studies and conduct; the number of members depending upon the number of danger points in the school neighborhood. We try to limit the number to 12 but in many localities have from 15 to 18 on a squad.

"Each squad has a captain and a first lieutenant. The principal of the school either takes charge of the patrol or appoints a teacher to assume directorship from one of the upper grades. Reports of offending children and motorists are made through the captain to the principal.

"All members are decorated with a green felt arm band bearing the insignia 'Safety Patrol,' and a green and gold enameled button, both of which are provided by the Philadelphia Rapid Transit Company. The captain wears in addition a green ribbon badge with the word 'captain' in gold.

"The duties of the safety patrol boys are to watch and supervise the ingress and egress of the pupils in their respective schools; to prevent children from crossing the streets at places other than at the crossings; and to discourage dangerous practices, such as hitching on the back of vehicles and playing in the streets.

"At 8.45 in the morning, the captain of the squad blows a policeman's whistle, to which the members respond by taking their appointed places along the sidewalks or corners. The children coming to school are directed to the corner, where usually the captain is stationed, and await his signal to cross the street. Sometimes the captain acts as roundsman, visiting the different posts to see that each boy is executing his duties to the best of his ability. One minute before dismissal the squads are permitted to leave the building, to supervise dismissal. In the afternoon, the same procedure is followed.

"The safety patrol organization is regarded by the school authorities here as most efficacious, in that not only does it serve to reduce accidents but elevates the morale generally in the school. The boys are made to feel that their position is one of honor and trust, and respond accordingly. A sense of pride for the organization in every school is evidenced by the entire student body in the respect and obedience given.

"The captains usually put their members through some

little military drill, including roll-call and calling off, for the purpose of training the youngsters to take direction and act quickly. Of course the military touch has an appeal, and makes the boys feel an importance.

"Either the principal or teacher in charge holds a meeting about every two weeks, at which time discussions of various kinds are made. Once every two or three months a meeting is held in the Chamber of Commerce or some other hall centrally located, to which all the squads from all parts of the city come. Demonstrations of little drills which the captains put their members through are given, and discussions as how to best cope with dangerous conditions peculiar to certain localities encouraged."

Safety Patrol of Philadelphia.

Article I.—The name of this organization shall be "Safety Patrol of Philadelphia."

Article II.—*Object of the Organization.*—The "Safety Patrol of Philadelphia" is organized for the purpose of protecting the lives and limbs of children from street dangers, and encouraging safe practices in work and play.

Article III.—*Qualifications for Membership.*—Section I.—1. Members of the Patrol squads must be boys of keen judgment, who have the ability to act quickly and wisely in emergency.

2. They must be boys of upstanding character who are capable of carrying responsibility.

3. They must be courteous and considerate of the rights of others, and their conduct at all times must be such as will be a credit to the dignity and honor of their organization.

4. Members of the Patrol must maintain a passing grade in all school subjects.

Note.—If a member's standings fall below the passing grade, he shall be suspended for two weeks. If at that time they have not been brought up to passing, he shall be dropped from membership.

PLATE V

A Dangerous Crossing Without a Safety Patrol.

PLATE VI

The Safety Patrol (Upper Right); The Patrol in Action.

SECTION II.—1. Senior Patrol members are appointed from pupils of the seventh and eighth grades.

2. Junior Patrol—In schools having only six grades, boys from the sixth grade may be appointed to form a Junior Patrol. The Junior Patrol shall follow the rules for the government of the Senior Patrol.

NOTE.—Children serving only within the school building or in the playground shall not be known as Patrol members, and therefore, are not entitled to Patrol insignia. Arm bands of school colors may be worn.

ARTICLE IV.—*Officers.*—1. Each squad shall have a Captain and a First Lieutenant.

2. Captain's duties:
    1. To drill his men.
    2. To conduct daily inspection (to see that his men are tidy in appearance and are wearing arm bands and buttons while on duty).
    3. To station his men at points of danger.
    4. To see that his men are at their posts and on duty twelve minutes before school opens in the morning, five minutes, or as long as necessary, after it closes in the afternoon, and five minutes after the close of the morning session and before the opening of the afternoon session.
    5. To report all violations of the law by motorists to principal or teacher in charge.
    6. To report all child offenders to principal or teacher in charge.
    7. To receive and send all communications with the Safety Department.
    8. The Captain has authority over his men while on Patrol duty, and must not use his authority for personal ends.
3. Lieutenant's duties:
    1. To assist Captain in inspection.
    2. To serve as Captain in case of the Captain's disability.

ARTICLE V.—*Appointments.*—1. Appointments to Patrol membership are made as soon as possible after the opening of school in September, and the first week in February.

2. Members are appointed by the principal or teacher in charge, subject to Miss Roadifer's approval. Officers are elected from the members appointed, by the Patrol members.

ARTICLE VI.—*Term of Office.*—Five months constitutes one term. Members may be reappointed.

ARTICLE VII.—*Certificates.*—Certificates of honor are awarded to members who have served five consecutive months on the Safety Patrol.

ARTICLE VIII.—*Duties of Members.*—1. The first and most important duty of the members of the Safety Patrol is to protect the lives of the children of their school and to teach them how and where to cross the streets.

2. To respect and obey the Captain while on duty.

3. To consider others' rights and treat everyone with fairness and courtesy.

4. To report law breaking motorists to the Captain—giving him their license number and details of the offense.

5. To report offending children to the Captain, giving details of the offense.

6. To defend and protect the honor of the Safety Patrol at all times.

ARTICLE IX.—*Drills.*—1. Military drills, drill in traffic signaling and management shall be given to the Patrol men, by a police lieutenant.

2. The count off shall be given by the Captain immediately after the bell rings at nine o'clock every morning.

3. The Safety Patrol shall take charge of the fire drills under the principal's direction.

ARTICLE X.—*Meetings.*—1. Meetings may be called by Miss Roadifer for the purpose of discussing problems of individual patrol squads, reporting progress since last meeting, and giving and receiving suggestions for improvements.

2. Squad meetings may be called by the teacher in charge.

3. Squad meetings may be called by the Captain with permission of the teacher in charge.

ARTICLE XI.—*Roundsmen.*—A member of each Patrol squad shall be chosen to act for one week as roundsman, to report the work of the Patrol. This person is to be unknown to the other members.

ARTICLE XII.—*Expulsion.*—A member may be dropped from the Safety Patrol at the discretion of the principal.

ARTICLE XIII.—*Number Composing a Squad.*—The number composing a squad depends upon the needs of the individual school. Where more than 12 boys are required to guard all points of danger, Miss Roadifer, a member of the Police Department and a member of the Department of Safety shall determine the number needed.

CHILD LABOR: MEDICAL SUPERVISION.

The relation of industry to the employment of children of school age has a marked effect on the health and education of the children so employed and bears an important relation to their future health and happiness.

The question of why children leave school to enter industry is a non-medical one but indirectly to be considered. A study shows two chief reasons: (1) Dislike school; (2) financial aid necessary for the family. These causes should be squarely met and the remedies applied to keep the child at school until a definite age or physical growth. We must be mindful in promulgating child-labor laws that no harm may come to an overphysically developed boy at thirteen years and gross harm to a physical weakling of sixteen. The age limit becomes indefinite when it is linked with physical development.

The extent of child labor is not known. It is estimated that three-fourths of those employed are in farm work. This is more prevalent in the south and west. There is some work which is both healthful and educational for adolescent boys

and should be so recognized. It is impossible to write any law which will fit all cases, so it is necessary to give minimum standards or requirements. The objects of child-labor laws are:

1. To see that the child is physically able to perform the work required of him.

2. There must be no injury to the physical health or development.

Legislation on this subject is a State function. The Federal Children's Bureau, Department of Labor, has endeavored to control such laws throughout the country but has not succeeded because it is only an advisory bureau in State problems. Many States have enacted some laws on the subject but there is no uniformity in the requirements. Pennsylvania has an age limit; Chicago has a minimum standard in height of 4 feet 7 inches and weight of 75 pounds, at the age of fourteen years. In both States a complete physical examination is made. In Great Britain there exists a national law which forbids employing any child under the age of fourteen years and permits a locality to maintain a limit at fifteen years (Fisher Bill). It requires attendance at continuation school to eighteen years. A rigid physical examination is necessary.

In 1919, a committee under the Children's Bureau met in Washington to formulate minimum standards of Child Welfare, and mentioned a certificate of physical fitness signed by a public health physician or a school physician.

The procedure for physical examinations is similar to the routine examinations in classes except the examiner keeps in mind the status of the law on what defects will temporarily or permanently prohibit a working certificate. The forms used are varied but have many points of similarity. The following are samples used in Philadelphia. There is also submitted the data of results of examinations in a few cities.

TABLE XLIV.—NEW YORK.—DATA IN RELATION TO ISSUANCE OF PERMANENT EMPLOYMENT CERTIFICATES.

	Manhattan.	Bronx.	Brooklyn.	Queens.	Richmond.	Total.
Total number of physical examinations	12,764	4219	15,989	3575	774	37,321
Total number of certifications of physical fitness	9,181	3894	13,940	2876	497	30,388
Total number of rejections for physical conditions	3,583	325	2,049	699	277	6,933
1. Temporary:	3,428	295	1,927	684	274	6,608
Vision	1,489	226	565	158	25	2,463
Teeth	1,716	47	1,215	539	248	3,765
Tonsils or adenoids	506	6	62	2	1	577
Malnutrition	152	2	42	4	...	200
Contagious eye diseases	2	1	4	...	...	7
Contagious skin diseases	3	18	37	...	...	58
Not vaccinated	...	...	...	1	...	1
Tuberculous glands.						
Hernia	1	...	2	...	...	3
2. Permanent:	155	30	122	15	3	325
Cardiac disease	146	30	110	13	3	302
Pulmonary disease	...	...	2	1	...	3
Malnutrition	12	...	2	1	...	15
Syphilitic or tuberculous disease of bones and joints						
Trachoma	...	...	5	...	...	5
Chorea	...	...	3	...	...	3
Total deafness						
Irremediable defective vision						
Physical reëxaminations made	3,176	311	1,671	602	208	5,968
Granted	2,753	297	1,456	591	180	5,277
Refused	423	14	215	11	28	691
Certifications of forty-day papers						
VACATION EMPLOYMENT CERTIFICATES.						
Certifications of physical fitness	7,895	2455	7,740	1013	175	19,278

Table XLV.—Physical Examination of Children Applying for Employment Certificates, Philadelphia.

(At Bureau of Compulsory Education, in accordance with the State Child-labor Law.)

(July 1, 1921 to June 30, 1922.)

Certificates Issued or Refused.

I. Certificates issued			15,870
A. Issued at once		12,280	
1. Without restriction	11,895		
2. With time restriction	0		
3. With occupational restriction	385		
4. With time and occupational restriction	0		
B. Issued after correction of physical defects		2,851	
1. Without restriction	2,851		
2. With time restriction	0		
3. With occupational restriction	0		
4. With time and occupational restriction	0		
C. Issued after receipt of special medical certificate		572	
1. Without restriction	45		
2. With time restriction	31		
3. With occupational restriction	496		
4. With time and occupational restriction	0		
D. Issued after receipt of medical certificate and correction of defects		167	
1. Without restriction	132		
2. With time restriction	0		
3. With occupational restriction	35		
4. With time and occupational restriction	0		
II. Certificates refused			5,544
A. Temporarily, pending correction of defect		5,532	
1. First examination	3,936		
2. Subsequent examination	1,596		
B. Temporarily, pending receipt of medical certificate		10	
C. Permanently disabled		2	
III. Special examinations			591
Total examinations			22,005

Interviews with Parents.

Number of interviews	1632

Physical Defects Found in Course of Examinations.

I.	Physical defects not causing refusal of certificates, if corrected as far as possible, but causing the issuance of certificates with restrictions:	
	A. With restrictions as to employment about power-driven machinery:	
	Vision	619
	Hearing	209
	Heart lesion	11
	Orthopedic	51
	Epilepsy	3
		893
	B. With restrictions as to duration of certificates:	
	No. of cases	0
II.	Physical defects causing temporary refusal of certificates pending correction of defects:	
	Vision	1,245
	Hearing	140
	Carious teeth	2,512
	Malnutrition	8
	Heart lesion	9
	Diseased tonsils	11
	Hernia	7
	Pediculosis	467
	Miscellaneous	72
		4,471
III.	Physical defects causing permanent refusal of certificates:	
	No. of cases	0
IV.	Physical defects found with recommendation for correction, but defects not disqualifying:	
	Defective vision	2,207
	Minor eye defects	86
	Defective hearing	121
	Nasal obstruction	174
	Hypertrophied tonsils	378
	Carious teeth (less than 3)	4,799
	Malnutrition	322
	Stoop shoulders	546
	Non-contagious skin disease	1,407
	Heart lesion	678
	Defective speech	45
	Goiter	292
	Nervous weakness	22
	Miscellaneous	5
		11,082

TABLE XLVI.—RECORD OF PHYSICAL EXAMINATION

The examiner will record a √ in either Column 2 or Column 3 opposite each item listed in Column 1.

1	2 Physical condition satisfactory.		3 Physical condition unsatisfactory.				
				If one or more checks are recorded certificate is—			
Scope of physical examination. (1)	Criterion.	All spaces checked, certificate granted.	Criterion.	a Permanently refused.	b Restricted.*	c Limited in time.	d Refused until defects are corrected.
Right eye	Vision better than ½		Vision no better than ½	x x	x x	x x	
(2)	(glasses allowed)			x x	x x	x x	
Left eye	Vision better than ½		Vision better than ½	x x	x x	x x	
(2)	(glasses allowed)		(glasses allowed)	x x	x x	x x	
Both eyes	Vision better than ¾		Vision no better than ¾	x x	x x	x x	
(2)	(glasses allowed)			x x	x x	x x	
Both eyes	Vision ⅓ or better		Vision less than ⅓	x x		x x	x x
(3)	(glasses allowed)		(with certificate)	x x		x x	x x
Eyelids or conjunctiva	No inflammation		Inflammation	x x	x x	x x	
Nasal breathing	Normal		Chronic obstruction	x x	x x	x x	
Either ear (hearing)	Better than whispered		Whispered voice not	x x		x x	x x
(4)	voice at 2 feet		heard at 2 feet	x x		x x	x x
Teeth	Less than 3 carious		3 or more carious	x x	x x	x x	
Nutrition (5)	Normal or nearly so		Malnutrition	x x	x x		
Carriage	Eerect or nearly so		Marked stoop shoulders or curvature	x x	x x	x x	
Heart and circulation (6)	Normal or slight murmer with good compensation		Heart disease or pulse at 120+		x x	x x	x x
					x x	x x	x x
Kidney disease (7)	Not present		Present (specify)		x x	x x	x x
Tuberculosis	Not present		Present		x x	x x	x x
Graves' disease	Not present		Present		x x	x x	x x
Nervous exhaustion (8)	Not present		Present	x x	x x	x x	
Hernia	Not present or wears truss		Present (no truss)	x x	x x	x x	
Contagious skin disease	Not present		Present	x x	x x	x x	
				x x	x x	x x	
Eyes, arms, legs	All present		One or more not present	x x		x x	x x
Epilepsy	Not present		Present	x x		x x	x x

Always use INK

PRELIMINARY BLANKS.

Commonwealth of Pennsylvania
DEPARTMENT OF PUBLIC INSTRUCTION
ATTENDANCE BUREAU
Harrisburg

(This is NOT an Employment Certificate)

.....Name of Minor
Last name first

*.....No. of General Employment Certificate (G. E. C.) .....Date of Issue

Evidence of age accepted: (Check one)
(a) Birth Certificate
(b) Baptismal Certificate
(c) Passport
(d) Other documentary record
(e) Affidavit of parent or guardian accompanied by physician's statement of opinion as to the age of minor

Date of Birth		
Month	Day	Year

.....Signature of Minor Issuing Officer.....

Form PE—PROMISE OF EMPLOYMENT

.....Date

The undersigned agrees to employ.....in the capacity of for not more than.....hours a day or.....hours a week, and further agrees to coöperate with the public school authorities in obtaining the attendance of said minor at Continuation School as long as he is under sixteen years of age.

....
Kind of Industry Signature of Member, Superintendent, or Manager
Name of Firm Address of Firm

Form SR—SCHOOL RECORD

....Date
Guardian's or Parent's name in full

.....
Minor's name in full—Last name first

....
Guardian's or Parent's Residence Minor's Residence

School District	School Last Attended	Date of Birth of Minor			Grade Completed
		Month	Day	Year	

I hereby certify that the above named minor has completed a course of study equivalent to six yearly grades of the public school, in the English language, spelling, reading, arithmetic, geography and the history of the United States.

Signature of Minor Signature of Principal

Note: This card must be kept for inspection in the files of issuing officer.
* To be filled in by issuing officer when certificate is issued.

This stub is to be detached by issuing officer before filing—Form PB-GEC.

DIRECTIONS TO THE MINOR

Secure one of the evidences of age in the order given on the Preliminary Blank, then take this blank

First: To the employer.
He will fill out and sign Form PE.
Second: To the Principal of the last school attended. He will fill out and sign Form SR.
Third: To the Physician approved by the Board of School Directors. He will fill out and sign Form HC-PE.
Fourth: Take the blank back to the one who issues certificates and he will send the certificate by mail to the employer.

Remember this blank is not an employment certificate and must not be accepted as such.

* Not valid for work about power-driven machinery.

I HEREBY CERTIFY That I have made a thorough examination of the minor named on the reverse side of this form, and that the above is a true record of the examination and that for the occupation specified in the statement of the prospective employer the minor is:

Strike out in ink statements in the certificate which do not apply.

(*a*) Physically qualified.
(*b*) Physically qualified provided work is not about power-driven machinery.
(*c*) Permanently disqualified.
(*d*) Not physically qualified until defects (Column 3*c*) are corrected.
(*e*) Physically qualified for a period of ..... months from date.

.....M.D.
Signature of Physician Approved by Board of Sch. Directors.

.....
Date.

.....
Residence—Number and Street—City or Town.

.....
Signature of Minor.

INSTRUCTIONS.

If the physical defect is corrected after the first examination with rejection of applicant, and certificate thereupon issued, the examiner should place a circle around the original record (√) in column 3*a*, 3*b*, 3*c* or 3*d*, and should then record the condition as satisfactory (√).

FOOTNOTES.

(1)—Careful inquiry should be made into the previous history of the child, particularly regarding the history of attacks of scarlet fever, diphtheria, rheumatism, chorea or nervous conditions, frequent attacks of tonsillitis or sore throat and tuberculosis.

(2)—Certificate temporarily refused provided proper eye glasses will improve the vision. If a medical certificate is furnished that eye glasses will not improve the vision, but the vision is one-third or better, the regular certificate may be granted.

(3)—Special medical certificate must be furnished by a reputable physician stating that no degenerative or inflammatory process exists in the eye, and that employment *not* about power-driven machinery is not dangerous to the child.

(4)—Special, medical certificate must be furnished by a reputable physician stating that treatment has been given without success, and that employment *not* about power-driven machinery is not dangerous to the child.

(5)—The examiner will consider the height, weight, color of the mucous membranes, muscular tone, nervous tone, bodily vigor and chest capacity. The following standards of height and weight for both sexes should be borne in mind, although considerable variation, within normal limit, may exist:

Fourteen years, 4 ft. 6 in., 83 lbs. Fifteen years, 4 ft. 8 in., 88 lbs.

(6)—Circulatory disturbance causing persistent rapid pulse (120 or over), while a symptom rather than a disease, must indicate a serious disturbance of the bodily economy, possibly incipient disease of the heart, lungs, kidneys or nervous system.

(7)—Diagnosis of kidney diseases shall not be made without chemical and microscopical examination of the urine.

(8)—Including chorea or hysteria.

.....192.....

To THE PARENT:

This is to notify you that the Physical Examination of your child,.....
who is an applicant for an Employment Certificate, shows the following physical defects:

.....

.....

.....

.....

In accordance with the provisions of the Child-labor Act, the certificate cannot be issued until these defects are corrected.

Chief of Bureau.

.....

Medical Inspector.

☛ If you are unable to procure the services of a private physician, or dentist, or of a dispensary, consult the principal of the school or call at this office for advice and help.

☛ This note must be returned by the minor if defects are corrected and application is again made for employment certificate.

☛ Unless defects are corrected immediately and application for employment certificate is made the next day the minor must return to school. The school record must be presented again if application is made later for employment certificate.

FORM C 120—PARENTS' NOTICE, REFUSAL OF CERTIFICATE, PHYSICAL DEFECTS —SCHOOL DISTRICT OF PHILADELPHIA.

STANDARDS OF PHYSICAL FITNESS.

(Established by the Department of Labor and Industry.)

I. *Certificate refused* under the following conditions:
   (*a*) Tuberculosis—including all types.
   (*b*) Organic heart disease—including endocarditis, myocarditis, pericarditis and circulatory disturbance causing persistent rapid pulse (120 or over).
   (*c*) Graves's disease.
   (*d*) Kidney disease.

(*e*) Defective vision—less than 15/45 (allowing the use of both eyes and eye glasses), except with certificate (see Article III).

(*f*) Any physical defect disqualifying the applicant in the opinion of the medical examiner.

II. *Certificate refused until correction of defects* as follows:

(*a*) Three or more decayed teeth.

(*b*) Defective Vision—15/20 or less, using both eyes, or 15/30 or less in either eye, provided proper eye glasses will improve the vision.

(When the vision is 15/45 or better (using both eyes) and a medical certificate is furnished stating that eye glasses will not improve the vision, the regular certificate may be used.)

When the vision is less than 15/45 the regular certificate cannot be granted (see Article III).

(*c*) Chronic nasal obstruction.

(*d*) Defective hearing (unless accompanied by trustworthy medical certificate that treatment has been given without success) (see Article III).

(*e*) Malnutrition.

(*f*) Marked nervous weakness, chorea or hysteria.

(*g*) Marked stoop shoulders, flat chest, or lateral spinal curvature.

(*h*) Hernia without truss.

(*i*) Contagious skin diseases.

(*j*) Any defect or disease disqualifying the applicant in the opinion of the medical examiner.

III. *Certificate issued only for employment not about power-driven machinery.*

(*a*) Epilepsy.

(*b*) Loss of one eye, arm or leg.

(*c*) Defective vision—less than 15/45, allowing use of either eye and eye glasses. When a medical certificate is furnished by a reputable physician stating that eye glasses will not improve the vision, that no degenerative or inflammatory process exists in

the eye, and that employment *not* about power-driven machinery is *not* dangerous to the child, a certificate may be issued for such employment.

(*d*) Defective hearing—whispered voice not heard at two feet distance. A medical certificate by a reputable physician, stating that treatment has been given without success, must be furnished.

INFORMATION ON ADMINISTRATION OF THE CHILD-LABOR ACT EMPLOYMENT CERTIFICATES—PENNSYLVANIA.

Employment Certificates Required.—Before a minor under sixteen years of age can be legally employed in any establishment or in any occupation, the employer must procure, and keep on file, an employment certificate issued for the minor by the Bureau of Compulsory Education.

Kinds of Employment Certificates.—Employment certificates are of two kinds—general and vacation.

The *general* employment certificate entitles the minor between fourteen and sixteen years of age to work during the entire year, provided he attends a continuation class, when such class is available, for a period or periods equivalent to eight hours each week.

The *vacation* employment certificate entitles the minor between fourteen and sixteen years of age to work on any day, provided such work does not interfere with required attendance at school.

Note.—No minor under sixteen years of age shall be permitted to work more than fifty-one hours in any one week, or more than nine hours in any one day, or before six o'clock in the morning, or after eight o'clock in the evening. The time in school shall be considered part of the working day or working week.

Time and Place of Issuing Certificates.—Employment certificates are issued at the Bureau of Compulsory Education, between the hours of 9.30 A.M. and 4 P.M., Saturdays, from 9 A.M. to 12 Noon.

By Whom Application is to be Made.—Application for the employment certificate must be made in person by the minor, accompanied by the parent, guardian or legal custodian of the minor.

General Employment Certificate.—When application is made for a general employment certificate the following papers must be presented by the minor:

1. A statement signed by the prospective employer stating that he will give employment to the applicant. (The official form for this purpose may be had from the principal of the school.)

2. A school record filled out and signed by the principal of the school which the minor last attended. This record must certify that the minor has completed a course of study equivalent to the six-yearly grades of the public school, in the English language, spelling, reading, writing, aritmetic, geography and history of United States. (The official form for this record will be furnished to the school.)

3. Proof of age as follows:

(*a*) A birth record, or

(A child born in Philadelphia may, upon written application to the Bureau of Compulsory Education, procure without charge, a copy of the birth record, if such a record is on file in the Bureau of Health. Request should be made, on a form provided by the principal of the school, at least three days prior to the application for the employment certificate.)

(*b*) A baptismal certificate or other religious record or

(*c*) A passport, or

(*d*) Other acceptable documentary record of age, other than school record or parent's affidavit.

Note.—In case documentary proof of age is not obtainable, and only in such case, the Bureau may accept the signed statement of the physician who makes the physical examination of the applicant, that, in his judgment, the minor has attained the age required by law. Such statement shall be

accompanied by an affidavit, signed by the minor's parent or guardian, certifying to the name, date and place of birth of the minor, and that the parent or guardian is unable to produce proof of age.

Vacation Employment Certificate.—A vacation employment certificate is obtained in exactly the same way as a general employment certificate, except that the school record is not required.

Certificate of Physical Fitness.—At the time application is made for the employment certificate, an examination of the applicant to determine physical fitness will be made, without charge, in the office of the Bureau by a physician appointed by the Board of Public Education.

Acknowledgment by the Employer of the Receipt of the Employment Certificate.—When the certificate is issued it is not given to minor, but is mailed directly to the employer. The employer is required to acknowledge in writing to the Bureau the receipt of the employment certificate, within three days after the beginning of the minor's employment. A stub for this purpose is attached to the employment certificate.

Return of the Employment Certificate to the Bureau.—

1. Should the minor for whom the certificate is issued fail to report for work within six days after the receipt of the certificate, the employer should return the employment certificate by mail to the Bureau.

2. On termination of the employment of the minor, the employment certificate issued for the minor must be returned by mail by the employer to the Bureau, immediately upon demand of the minor, or otherwise, within three days after the termination of the minor's employment.

3. Before the minor can be assigned to work different in nature from that specified in the employment certificate, the employer must return the employment certificate by mail to the Bureau, and procure for the minor a new certificate for the new kind of occupation.

Change of Employment Requires New Employment Certificate.—On termination of employment, the minor must either return to school or make application for a new employment certificate, presenting in official form, the signed statement of a prospective employer that he will give employment to the applicant.

Attendance at Continuation Class.—It shall be unlawful for any person to employ any minor between fourteen and sixteen years of age, unless such minor shall, during the period of such employment, attend a public continuation school for a period or periods equivalent to not less than eight hours each week. Employers are expected to communicate with the nearest continuation school, and arrange with the principal thereof for the enrollment of minors in their employ.

Certificates Issued under Act of 1909 are Valid.—On termination of employment, such certificates should be returned by the employer to the minors for whom they are issued. However, it should be noted that in accordance with Act of Assembly 97, Session of 1915, employers are required to foward immediately to the Bureau the names and addresses of minors who have left their employ, or who have been absent five days continuously.

Farm Work and Domestic Service in Private Homes.—The Child-labor Act, approved May 13, 1915, does not apply to children employed on the farm or in domestic service in the home. Minors between fourteen and sixteen years of age, whose parents desire to have them leave school for such employment, may be excused from attendance at school, on condition that it is clearly shown that "mental, physical, or other urgent reasons" exist which warrant such exemption. A circular of information has been issued furnishing details as to procedure.

Street Trades.—The law provides that no male minor under twelve years of age, and no female minor shall distribute, sell, expose, or offer for sale, any newspaper, magazine, periodical or publication, or any article of merchandise of any sort in any street or public place.

TABLE XLVII.—LAWS RELATING TO PHYSICAL REQUIREMENTS FOR EMPLOYMENT (JANUARY 1, 1921).

Examination by Physician before Child Goes to Work.—This summary shows the requirements for the issuance of regular employment certificates only, special permit, such as those granted on account of poverty, being omitted. Since an employment certificate is not always required for all occupations in which a child may legally be engaged, these requirements may not by any means affect all children entering industry. Examinations to determine age are not considered here.

State.	Requirement of examination.	Examining physician.	Physician certifies to—
Alabama	Mandatory	Public school physician or regularly licensed physician in good standing	1. Good physical development for age. 2. Sound health. 3. Physical fitness for intended work.[1]
Arizona	Mandatory	Medical officer of board or the department of health, or physician appointed by school committee	1. Normal development. 2. Sufficiently sound health and physical fitness for intended work.[1]
Arkansas	[No provision]		
California	Mandatory	Physician appointed by school board or other public medical officer	1. Normal development. 2. Sufficiently sound health and physical fitness for intended work.[1]
Colorado	[No provision]		
Connecticut	Mandatory	Physician designated by State board of education	1.— 2. Sufficiently sound health and physical fitness for intended work.[1] 3. [Certificate shall also indicate the kind of work suited to the child.]
Delaware	Mandatory	Physician designated by labor commission	1.— 2.— 3. Physical fitness for intended work.[1]
Dist. of Columbia	Optional[2]	[None specified (choice apparently left to issuing officer).]	1. Normal development. 2. Sound health. 3. Physical fitness for intended work.[3]
Florida	Optional	Medical officer of board or the department of health or the county physician	1. Normal development. 2. Sound health. 3. Physical fitness for intended work.[3]
Georgia	[No provision]		
Idaho	[No provision]		
Illinois	Mandatory	Physician appointed by municipal health department, or by board of education or other local school authority	1.— 2.— 3. Physical fitness for intended work.[1]
Indiana	[No provision[4]]		
Iowa	Mandatory	Medical inspector of schools or physician appointed by board of education	1. Normal development. 2. Sufficiently sound health and physical fitness for intended work.[1]
Kansas	[No provision]		
Kentucky	Mandatory	Public-health officer or physician appointed by board of education	1. Normal development. 2. Good health. 3. Physical fitness for intended work.[1]
Louisiana	[No provision[5]]		
Maine	Optional[2]	School physician or medical officer of the board of health	1. Normal development. 2. Sufficiently sound health and physical fitness for intended work.[3]
Maryland	Mandatory	Physician appointed by issuing officer[6]	1. Normal development. 2. Sufficiently sound health and physical fitness for intended work.[1]
Massachusetts	Mandatory	School or family physician or physician appointed by school committee	1.— 2. Sufficiently sound health and physical fitness for intended work.[1]
Michigan	Optional[2]	Medical officer of board or the department of health	1. Normal development. 2. Sound health. 3. Physical fitness for intended work.[1]

State.	Requirement of examination.	Examining physician.	Physician certifies to—
Minnesota	Mandatory	Physician designated by school board	1. Normal development. 2. Sufficiently sound health and physical fitness for intended work.[1]
Mississippi	[No provision]		
Missouri	Optional[2]	Medical officer of board or the department of health or regularly licensed physician	1. Normal development. 2. Sufficiently sound health and physical fitness for intended work.[7]
Montana	[No provision]		
Nebraska	Optional[2]	Physician provided by State department of labor	1. Normal development. 2. Sound health. 3. Physical fitness for intended work.[3]
Nevada	[No provision]		
New Hampshire	Mandatory	Medical officer of board of health or physician designated by school board	1. Normal development. 2. Sufficiently sound health and physical fitness for intended work.[3]
New Jersey	Mandatory	Medical inspector employed by board of education	1. Normal development. 2. Sufficiently sound health and physical fitness for any occupation in which child may legally engage.[1]
New Mexico	[No provision]		
New York	Mandatory	Medical officer of local board or department of health	1. Normal development. 2. Sound health. 3. Physical fitness for intended work.[3]
North Carolina	Optional[2, 8]	[None specified]	1.— 2.— 3. Physical fitness for intended work.[1]
North Dakota	Optional[2]	Medical officer of board or the department of health	1. Normal development. 2. Sound health. 3. Physical fitness for intended work.[3]
Ohio	Mandatory[9]	School physician, physician of the board of health, or physician appointed by school board	1.— 2.— 3. Physical fitness for any occupation in which child may legally engage.[1]
Oklahoma	Optional[2]	Medical officer of board or the department of health	1.— 2.— 3. Physical fitness for intended work.[3]
Oregon	Optional[2]	[None specified (choice apparently left to issuing officer)]	1. Normal development. 2. Sound health. 3. Physical fitness for intended work.[3]
Pennsylvania	Mandatory	Physician "approved" by the board of school directors	1.— 2.— 3. Physical fitness for intended work.[2]
Rhode Island	Mandatory	In Providence either of 2 physicians appointed by State commissioner of public schools; elsewhere physician to whom child is sent by issuing officer	1.— 2. Sufficiently sound health and physical fitness for any occupation in which he may legally engage.[1]
South Carolina	[No provision]		
South Dakota	[No provision]		
Tennessee	[No provision]		
Texas	[No provision]		
Utah	[No provision]		
Vermont	[No provision]		
Virginia	[No provision]		
Washington	[No provision]		
West Virginia	Mandatory	Medical inspector of the schools or the public-health officer	1. Normal development. 2. Sound health. 3. Physical fitness for intended work.[1]
Wisconsin:			
Outside Milwaukee	Optional[2]	[None specified (choice apparently left to the issuing officer)]	[Issuing officer[10] may refuse to grant work permit to child who seems "physically unable to perform the labor" at which he "may be employed," or if best interests of child will be served by such refusal.][1]
Milwaukee	Mandatory	Physician of city health department, of the school hygiene department of the city board of education, or any other competent physician	1.— 2.— 3. Physical fitness "to enter employment subject to the following limitations" (the limitations, if any, to be specified).[1]
Wyoming	[No provision]		

[1] Presentation of promise of employment required. (In certain States, this requirement is not specified in the law, but may be implied from the following facts: *Michigan.*—Certificate is to be returned to issuing officer upon termination of employment, and child must report to issuing officer each month, giving name of employer. *Minnesota.*—Issuing officer's monthly report to labor commissioner must show name of employer and nature of work child is to do, and employment certificate is returned to issuing officer upon termination of employment. *New Jersey.*—Employer must notify issuing officer of nature of child's employment within two days after employing child, and certificate is returned to issuing officer upon termination of employment.) In *North Carolina* this requirement is prescribed by the State child-welfare commission.

[2] Because issuing officer's power to require an examination by a physician is implied from the fact that the law requires him to certify to child's physical condition (*District of Columbia* and *Oregon*); because issuing officer must certify to child's physical condition and is specifically empowered to require examination by physician (*Florida, Michigan, Missouri, Nebraska* and *North Dakota*); because issuing officer must "be satisfied" as to the child's physical fitness and is empowered to require examination by physician (*Oklahoma*); because issuing officer is empowered to require examination by physician "in doubtful cases" (*Maine*); or because issuing officer (industrial commission or some person designated by it) may refuse permit to a child who seems physically unable to perform intended work or if in his judgment "the best interests of the child would be served by such refusal" (*Wisconsin*); or because State child-welfare commission, which may prescribe conditions under which employment certificate shall be issued, has authorized issuing officers to require examination by physician if physical condition of child is doubtful (*North Carolina*).

[3] Promise of employment not required by law. (But where child must be physically fit for intended work, it might be implied that the issuing officer may demand formal notice of the work child is to do.)

[4] If specified evidence of age is not available, issuing officer may certify that in his opinion child is over fourteen and physically fit for intended work.

[5] Child at work who appears to factory inspector to be under legal age must obtain from city or parish physician a certificate as to physical fitness to perform work required. As factory inspector is also issuing officer, it is possible that he might require examination before issuance of employment certificate.

[6] State board of labor and statistics issues employment certificates in Baltimore and branch offices; elsewhere the local school superintendents appoint the examining physicians, who also issue the employment certificates.

[7] Promise of employment not required by law, but kind of work which child "states he intends to perform" is recorded on employment certificate, and monthly reports from issuing officer to State factory inspector must show prospective employer, "if known," and nature of work in which child intends to engage.

[8] Employment certificate is not specifically demanded by the law, but, if obtained, it is *prima facie* evidence that child is of legal age for employment.

[9] Previous record of school physician showing child sound in health may be accepted as substitute in discretion of issuing officer.

[10] State industrial commission or person appointed by it.

THE FUTURE OF HEALTH SUPERVISION.

To forecast what the next ten years will bring in child welfare is impossible, but to tell what the principle objectives should be is possible to any experienced health official.

Certain communicable diseases should be practically eliminated to the extent of calling them rare. Diphtheria should be prevented by wholesale treatments in infancy with toxin-antitoxin. Smallpox should be unknown by compulsory vaccination in the first three months of life. Scarlet fever, measles and whooping-cough may be added to the list of those preventable by serums. The evil effects of poor sanitation, especially improper or faulty heating and ventilation may be so corrected by our experts on school construc-

tion as to lessen the respiratory diseases and fore-runners of tuberculosis.

The curriculum in schools may be so inviting to the child, that the teacher and child will not look on education as a punishment of childhood. The teacher enfeebled with advancing age, and those grouchy with the burden of physical ailments will be replaced with active healthy instructors who enter into the spirit of childhood, thereby saving the drain on the nervous systems of their charges.

Malnutrition and its kindred ailments will vanish with the education of the parents and children. The school will no longer house a lunch-room.

Real health habits and physical training will replace the antiquated physiology, anatomy and hygiene.

Physical defects which directly affect education will be corrected before the child is permitted to enroll. Yearly examinations will be unnecessary, and replaced with such procedure only on entering, and graduation to high school and out of it. The time of the health supervisor and nurse will be consumed in getting results, not statistics; in teaching healthful living, not in recommending for acute illness.

Normal-school graduates and prospective teachers will be learned in real health problems. Those applicants for normal schools who are physically unfit, those who are temperamentally unsuited and those who lack the high personality needed for this important profession of teaching will be debarred.

The treatment of teeth, tonsils and eyes will be ample from the medical organizations without making it a semi-educational duty.

Each child will be taught to its individual capacity and in preparation for its future life work. The unteachable child will be amply cared for by the State.

Each graduate of a public-school system will be a potential health official for his family. Those who know and should teach public health will write the newspaper articles and not self-seeking charlatans.

Home studies will be replaced with time for healthful recreation and pleasures of that all too short period of childhood.

Teachers, janitors and others connected with the school systems will not be exempt from health supervision. The school nurse will be the district health nurse with an assignment of two or three blocks. She will be acquainted with all social conditions existing, their effect on health and education and endeavor to correct faulty conditions. She will be confidential advisor to the families. There will no longer be a duplication with dispensary nurse, tuberculosis nurse, child-hygiene nurse, school nurse and a half dozen social visitors all visiting the same home.

The above thoughts are not idle dreams of an idealist, but sane hopes which should be realized in part. Each terse sentence is an assertion which may furnish thoughts for those who are in a position to act.

CIVIL SERVICE AND COMPETITIVE EXAMINATIONS FOR POSITIONS OF SCHOOL MEDICAL INSPECTOR.

Several cities that have medical school officers and examiners have appointed them from eligible lists on results of examinations. There can be little dispute as to whether more efficient men are obtained in this manner. If the examination is practical, consisting of questions pertaining to the position to be filled and the examiners are unaware of whose papers are being marked, the results should be satisfactory. Men who have served provisionally in such appointments have an advantage insofar as knowing the practical work.

The examination should be divided into

1. Written: To show a practical knowledge of the subject.
2. An experience sheet previously prepared.
3. Oral examination to observe personality.

True civil service eliminates politics and favoritism. A

man may be coached for an examination by someone familiar with the work, and thus pass with a high average. This is not a reflection on civil service.

Questions for Examinations.—To assist civil service examiners in preparing questions and to assist those taking such examinations in knowing what to study, the author has prepared a number of possible questions, to which are added the questions asked in a recent examination in Philadelphia.

The branches of most importance are: Public hygiene, pediatrics, contagious diseases, diseases of the skin, eye, ear, nose and throat.

The following are illustrations of questions which may be asked:

1. What do you consider the duties of a medical inspector are?
2. What instruments and other equipment should a medical inspector carry with him to properly perform his work?
3. What has been your training since graduation that fits you for the position?
4. What are the duties of a school nurse?
5. Describe in detail a method of performing medical inspection to coöperate with a school nurse.
6. What should be the equipment of a school nurse?
7. What diseases or defects can safely be treated at school by the school doctor?
8. What disease or defects can safely be treated at school by the school nurse?
9. Describe a school consultation with a parent; state object.
10. Describe in detail a routine examination of a pupil for physical defects.
11. Describe in detail the method of examination of a class for contact cases of some contagious disease.
12. Describe the method of examination of the eyes of a pupil.

13. Describe a method of examination of the ears of a child.

14. Describe a method of examination of the nose and throat. What defects or diseases would you look for?

15. Describe a record card which would be suitable for recording the defects found in a pupil.

16. Outline a system for keeping records of work performed by a medical inspector.

17. If you recommend treatment for a physical defect found in a child, and parents ignore the recommendation, how would you proceed to obtain results?

18. How would you conduct an examination of the sanitary condition of a school building?

19. Mention some insanitary conditions that may be found in a school building.

20. Describe a system of heating and ventilation suited for a school.

21. Outline a method of lighting a school-room containing forty seats.

22. Describe the furniture which should be in a classroom and the location in respect to lighting.

23. Describe an open-air school.

24. What is a special school? What are its purposes? What class of children would you refer to a special school? To a special class?

25. Outline a course of study suited for a mentally backward child.

26. What are the common communicable diseases found among children?

27. What diseases may be suspected in a child with its throat bandaged, and how would you diagnosticate one from another?

28. Give the differential diagnosis in measles, scarlet fever, German measles, and chicken-pox.

29. Give the differential diagnosis in chicken-pox and variola.

30. What action would you take if you discovered a child suffering from scarlet fever in a class-room?

31. What action would you take if you discovered a child suffering from measles in a class-room? From diphtheria?

32. What should be the period of exclusion from school of a child suffering from measles? Chicken-pox? Smallpox? Diphtheria? Scarlet fever? Whooping-cough?

33. What diseases should be reported to the Health Department?

34. Describe the technic of performing a vaccination.

35. What constitutes a successful vaccination?

36. When is a child immune against smallpox?

37. Describe the method of taking a culture in a suspicious case of diphtheria.

38. When may a child who has had diphtheria return to school with safety to the class? In scarlet fever? In measles? In whooping-cough?

39. Describe a method of disinfecting a school after finding of a case of diphtheria.

40. Describe a method of examination for vision.

41. What inflammatory diseases may affect the conjunctiva and how would you diagnosticate one from the other?

42. Describe a case of trachoma.

43. How would you test the vision of an illiterate? Of a feeble-minded child?

44. Describe a method for testing hearing of a child.

45. What diseases may cause earache?

46. What diseases may cause a swelling of face or neck?

47. Describe a method for testing speech.

48. What defects may occur in breathing and mention their causes?

49. Name the five commonest and most prevalent diseases of the skin occurring in children. Diagnosticate one from the other.

50. Describe three skin diseases which are contagious.

51. Describe the symptoms of two common nervous diseases occurring in children.

52. What are the causes and treatment of lateral curvature of the spine?

53. What systemic diseases would debar a child from taking part in the physical exercises at school?

54. Name the physical defects which may cause a subnormal or mentally defective child.

55. Outline a method of inspection for diagnosticating mental deficiency.

56. Describe the Binet tests.

57. What recommendations would you offer for a subnormal or retarded pupil? For a mentally defective pupil?

COMPETITIVE EXAMINATIONS FOR SCHOOL MEDICAL INSPECTOR HELD IN PHILADELPHIA.

1. What in your opinion are the two most important acute throat infections, and how would you diagnosticate them?

2. What are the principal etiological factors in acute middle-ear infections occurring in children, and how make early diagnosis of the ear involvement?

3. What objective symptoms would lead you to believe that a child is in need of nasal treatment?

4. Name the contagious diseases of the eye or its appendages, and give in detail technic of examination.

5. Give age at which chlorosis occurs most frequently; its causes; the symptoms and blood conditions.

6. Mention the causes of backache in young girls aside from that due to pelvic disease.

7. State symptoms which would cause you to suspect the existence of an eruptive fever in its early stage.

8. State causes which would determine you to exclude children from attending school.

9. Describe a routine method of school medical inspection, including inspection, methods of heating, lighting, ventilating, cleaning, exercise and physical examination.

10. Draw a simple diagram of and described an ideal school-room, with furniture, for 20 children of about fourteen years of age.

11. Describe briefly a fresh-air school, such as would be possible in the center of a city of the first class, and outline the course of treatment given to a pretubercular child of fourteen years attending it in winter.

12. A teacher reports a girl of fifteen as being deficient in her studies; outline a practical investigation, giving five possible reasons for such a condition, with a brief treatment of the cause as finally determined.

EXAMINATION FOR THE POSITION OF SCHOOL NURSE.

Medicine:

1. (*a*) How would you recognize malnutrition in a school child?
   (*b*) If a poorly nourished child also had incipient tuberculosis of the lungs, how would you recognize the existence of the tuberculosis?
2. (*a*) What is meant by the term "focal infection?"
   (*b*) Give two common starting points of focal infection.
   (*c*) Name at least two diseases caused by focal infection.
3. How is syphilis recognized six months after the contraction of the disease? Give clinical and laboratory means of recognition without giving details.

Pediatrics:

4. (*a*) Give a diet consisting of ten articles suitable for a school child.
   (*b*) What are the three principle classes of foodstuffs, these three being all found in milk?
   (*c*) Does the potato taken alone furnish a well balanced diet? If not, for what reason, referring to the proportion of the three classes of foodstuffs, as they exist, or do not exist, in the potato?

Contagious Diseases:

5. If a child has a sore throat, what possible diseases may he have?
6. What is the infecting organism of
   (*a*) Tuberculosis,
   (*b*) Diphtheria,
   (*c*) Typhoid fever,
   (*d*) Syphilis,
   (*e*) Gonorrhea,
   (*f*) Pneumonia (mention one of the common ones).
7. What is the infecting agent in
   (*a*) Pediculosis,
   (*b*) Scabies,
   (*c*) Ringworm.
8. How would you treat
   (*a*) Ringworm,
   (*b*) Pediculosis.

Hygiene:

9. What are the four essential health habits necessary to the maintenance of good health and good nutrition in a child?
10. Suppose a physician vaccinates a child and refers the case at once to a nurse for proper after-care. Describe the sanitary precautions taken by both the doctor and the nurse from the time the child arrives to be vaccinated until the vaccinated arm has entirely healed.

EXAMINATION FOR SCHOOL MEDICAL INSPECTOR.

1. Describe a method for conducting school medical inspection.
2. Offer some suggestions for improving the present system employed.
3. What are the functions of a school nurse? What are the relations of work of school nurse and school doctor?
4. Describe an inspection for sanitation of a school.

5. How should a school be disinfected? When?

6. What would be your procedure on finding a case of diphtheria in a class-room?

7. What are some difficulties encounted in having recommendations acted on and how would you overcome them?

8. What are the most important and frequent physical defects found among school children?

9. How would you diagnose a mentally deficient child?

10. What kind of cases can be placed in special classes?

QUESTIONS FOR POSITION OF CHIEF OF CHILD HYGIENE.

Training and Experience.—1. Give a statement of your educational training, giving names of schools and colleges attended, with location; dates of attendance; courses pursued; degrees, if any, conferred.

2. What special courses of study have you pursued?

3. When and where were you licensed to practice medicine?

4. Give a statement of the business, teaching and medical positions you have held (nature of work, location dates and reasons for changes made).

5. Give a more complete statement of any special preparation, employment, business or profession that you had which in your opinion has direct bearing on the position for which you are now being examined.

6. Have you specialized in any branch of medicine? If so, give details.

7. Give a list of the learned professional societies to which you belong.

8. State any original or creative work that you have done. Copies of any publications that you have written or a reference list thereof must be submitted.

9. What professional experience have you had in preventive Medicine, especially as related to the reduction of infant mortality?

NOTE.—In your statement of experience account for your entire time since your graduation in medicine.

INDEX.

D

N

O

P

Q

R

S

T

U