THE NEW YORK COMMISSION ON VENTILATION Renews Studies of Ventilation in School Rooms

TT THILE "fresh air" has been for many years one of the most familiar commandments of the apostles of health, and one which sounds very simple, there is not yet agreement among scientists as to just which properties of fresh air are essential to health and how they can best be supplied in rooms where people are confined in close contact for several hours at a time. What the New York Times characterized editorially (February 27, 1927) as "the most valuable studies ever made of our indoor air requirements" were carried on during the years 1913-1917, by the New York State Commission on Ventilation, in some of the public schools of New York City.

It will be recalled that this Commission was appointed by the Governor of New York on the request of the New York Association for Improving the Condition of the Poor, which suggested its personnel, and that the Milbank Memorial Fund provided the money for its work. Its primary task was

an investigation to determine the best methods of ventilating school buildings. Although the report on this investigation was published in 1923, and although it has occupied the center of the stage in all discussion of the problems of school ventilation in the four vears since its publication, "there is little evidence," to quote again from the Times, "that the principles enunciated in its highly instructive pages" (which are summarized in an insert on the following page), "have been applied as widely as might have been hoped."

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THE Commission confirmed the view advanced by English and German physiologists that under ordinary conditions the objective of ventilation in the schoolroom should be the avoidance of overheating rather than the dilution of hypothetical but non-existent organic poisons; and arrived at the conclusion that the present practice of mechanical ventilation, supplying thirty cubic feet of air

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F I N D I N G S of the VENTILATION COMMISSION

(The avoidance of overheating is the primary essential in all systems of ventilation.

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C A reliable thermometer (with the 68° F. mark clearly indicated as a danger point) should be prominently displayed in the classroom.

per pupil per minute, is not only unnecessary, but positively harmful to health, since it almost inevitably involves overheating, to protect the exposed parts of the body against the excessive heat loss due to higher air flow.

It was the conclusion of the Commission that a simple system of window ventilation and gravity exhaust ducts, with ample direct radiation and window deflectors, is distinctly more favorable to the health and comfort of the pupils than the plenum-fan system. Ventilation by means of window inlets and gravity exhaust presupposes the use of a vapor or vacuum steam heating system, and there are several conditions which are essential to its success. The radiators should be located under the windows, and should extend the full width of the windows from which the air supply is to be derived. Deflecting boards of some satisfactory type should be placed at the bottom of the windows. The windows should be open from the bottom and not from the top. Exhaust ducts, opening near the ceiling in the classroom wall opposite the windows and terminating above the roof in an aspirating cowl, should be provided; and these ducts should be equipped with volume and shut-off dampers. Whatever kind of ventilating system is employed, it is axiomatic that the schoolroom should not be overcrowded, and that the sources of direct radiation should be provided with shields

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THE findings of the Com-mission have received the hearty and unanimous support of medical and hygienic authorities, and have been specifically endorsed by the Ioint Committee on Health Problems in Education of the National Education Association and the American Medical Association. and also by the American Public Health Association They have been accepted also by a small group of progressive ventilating engineers: but the majority of this profession, not unnaturally, has rallied to the defence of the practice which they have succeeded in embodving in the laws and official regulations of about half the states of the Union.

In view of the lack of agreement between hygienists on the one hand and ventilating engineers on the other, it seemed important that the Commission should be revived, in order that there might be some disinterested body, of scientific standing, to maintain a bureau of information

Quarterly Bulletin July 1927

and to conduct further investigations in the technical, legal, and economic aspects of the problems of school venti-

O B J E C T I V E S of the VENTILATION COMMISSION

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C To continue the investigation of the underlying physical laws and physiological reactions showing the relation of air conditions to health.

(To carry forward the comparative study of various methods of schoolroom ventilation.

 \mathbb{Q} To accumulate data in regard to systems of window ventilation actually in operation; and to study further the conditions essential to the success of this method, with regard to the amount of radiation, dimensions of exhaust ducts, et cetera.

(To answer inquiries and requests for assistance from school authorities, architects, and others.

C To study the ventilation legislation in the various states; and to consider possible standards of ventilation which might be recommended as substitutes for the present requirements, which are generally based on discredited theories.

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lation. This was proposed, together with an outline of what the Commission might profitably undertake, in a letter by Professor C.-E. A. Winslow, Chairman of the original Commission, to the Secretary of the Milbank Memorial Fund, under date of April 15, 1926. Professor Winslow suggested, among other activities, that it would be "most desirable to make an intensive and detailed study of the costs and results of various systems of school ventilation" in the three areas where the New York Health Demonstrations are in progress. 3

THIS proposal received **I** favorable consideration by the Board of Directors of the Milbank Memorial Fund, and the Commission accordingly resumed activities. An office was opened in September, 1926, at 370 Seventh Avenue, New York, in charge of Thomas J. Duffield, who was selected as Executive Secretary of the Commission; and work was promptly begun to develop the program outlined in the insert on the preceding page.

When the proposal to revive

the Commission was discussed it was the opinion of the members that more effective work could be done as an independent body. Accordingly, at a meeting of the Board of Directors of the Milbank Memorial Fund on March 28, 1927, the Commission was reconstituted as "an unofficial organization to be known as the New York Commission on Ventilation, for the purpose of disseminating the findings of the official body known as the New York State Commission on Ventilation, and to continue further ventilation research, demonstration, and education, in cooperation with the Technical Board of the Fund." All the members of the original Commission were invited to serve on the new body-Professor C.-E. A. Winslow, Dwight D. Kimball, Dr. Frederic S. Lee. Dr. James Alexander Miller, Professor Earle B. Phelps, and Professor Edward L. Thorndike-and in addition, Dr. George T. Palmer, who had directed its earlier investigations.

A^T the office of the Commission information is being collected in regard to

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experiments and investigations which are in progress elsewhere, and in regard to current practice and developments in legislation on this subject. The Executive Secretary and members of the Commission are in correspondence with school authorities and governmental agencies throughout the country. The principles which should be embodied in a model law or regulation governing the ventilation of school buildings have been carefully considered and formulated, and are available to any one who is interested. It is hoped that legislation based on these principles will be substituted, as rapidly as possible, for the requirements involving costly equipment which are now in force in many states.

To accumulate more data as to the relation between systems of ventilation actually in use and the health of school children, and as to the exact conditions under which window - gravity ventilation operates most successfully, the Commission is conducting comprehensive studies in Syracuse and Cattaraugus County, in connection with the urban and rural health demonstra-

Quarterly Bulletin July 1927

tions which have been stimulated and financed in part by the Milbank Memorial Fund. The studies in Cattaraugus County are of special interest because they are the first of their kind to be made in small country schools.

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TN Syracuse six schools were selected for the studies during the academic year 1926-1927. Three of them are old buildings, with old heating systems and no provision for ventilation except by opening the windows. The other three are new, equipped with steam heat and the fan-system of ventilation. Records were kept in 54 classrooms—all the rooms above the first grade in the six schools-from November 29 to April 14. In Cattaraugus County the studies of 1926-1927, covered 45 country schools; most of them with a single room, a few with two rooms, giving a total of 54 classrooms, the same number as in Svracuse. Here the record-keeping was begun late in December or early in January, and was carried on to April 14. None of the schools included in either study was equipped with the window-

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gravity ventilating system recommended by the Commission.

The general plan of the study was the same in both places. The teacher kept a daily record, on forms provided for the purpose, of indoor temperature, of the number of pupils on the active roll, of the attendance, and of the number of pupils, whether present or absent, who were affected by respiratory disease. The temperature record provides for a minimum of eight indoor readings dailyat the opening and close of each session and just before and just after the mid-session recess-with four more, bringing the total to twelve, in selected rooms. These daily records were supplemented, in the Cattaraugus County study, by observations taken at frequent intervals-once in ten days or two weeks-by a technical observer. He noted his own sensations of temperature, humidity, and air motion, on entering the room; the temperature at the floor, at breathing level, and at the ceiling, at desks in different points of the room: and other pertinent data. The records made in 1926-1927 are now being tabulated and studied, and plans are being made for resuming the collection of data in both places next year.

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 A^{s} a step towards resolv-ing the unfortunate controversy of recent vears between hygienists and ventilating engineers, a Central Conference Committee on School Ventilation has been organized, at the instance of the Chairman of the Commission on Ventilation. The Conference Committee includes representatives of the American Society of Heating and Ventilating Engineers, the American Public Health Association, the Joint Committee of the National Education Association and the American Medical Association, and the New York Commission on Ventilation. It is the hope of the Commission that, through the offices of this Conference Committee, the ventilating engineers may agree to waive all artificial and arbitrary standards that may have been sanctioned in the past, and to engage in co-operative experimental studies.