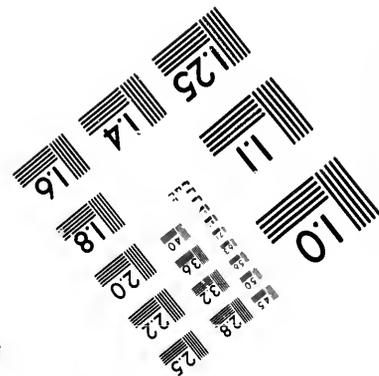
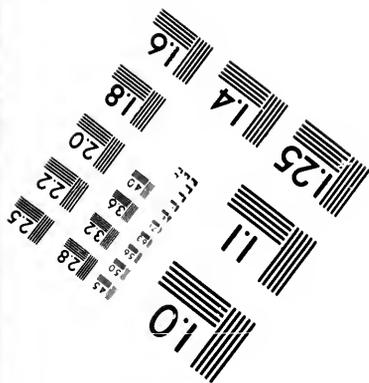
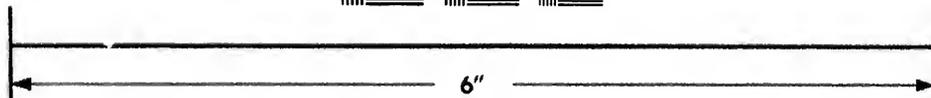
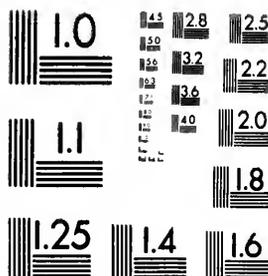


IMAGE EVALUATION
TEST TARGET (MT-3)



Photographic
Sciences
Corporation

23 WEST MAIN STREET
WEBSTER, N.Y. 14580
(716) 872-4503



**CIHM/ICMH
Microfiche
Series.**

**CIHM/ICMH
Collection de
microfiches.**



Canadian Institute for Historical Microreproductions / Institut canadien de microreproductions historiques



© 1987

Technical and Bibliographic Notes/Notes techniques et bibliographiques

The Institute has attempted to obtain the best original copy available for filming. Features of this copy which may be bibliographically unique, which may alter any of the images in the reproduction, or which may significantly change the usual method of filming, are checked below.

L'Institut a microfilmé le meilleur exemplaire qu'il lui a été possible de se procurer. Les détails de cet exemplaire qui sont peut-être uniques du point de vue bibliographique, qui peuvent modifier une image reproduite, ou qui peuvent exiger une modification dans la méthode normale de filmage sont indiqués ci-dessous.

- Coloured covers/
Couverture de couleur
- Covers damaged/
Couverture endommagée
- Covers restored and/or laminated/
Couverture restaurée et/ou pelliculée
- Cover title missing/
Le titre de couverture manque
- Coloured maps/
Cartes géographiques en couleur
- Coloured ink (i.e. other than blue or black)/
Encre de couleur (i.e. autre que bleue ou noire)
- Coloured plates and/or illustrations/
Planches et/ou illustrations en couleur
- Bound with other material/
Relié avec d'autres documents
- Tight binding may cause shadows or distortion along interior margin/
La reliure serrée peut causer de l'ombre ou de la distorsion le long de la marge intérieure
- Blank leaves added during restoration may appear within the text. Whenever possible, these have been omitted from filming/
Il se peut que certaines pages blanches ajoutées lors d'une restauration apparaissent dans le texte, mais, lorsque cela était possible, ces pages n'ont pas été filmées.
- Additional comments:/
Commentaires supplémentaires:
- Coloured pages/
Pages de couleur
- Pages damaged/
Pages endommagées
- Pages restored and/or laminated/
Pages restaurées et/ou pelliculées
- Pages discoloured, stained or foxed/
Pages décolorées, tachetées ou piquées
- Pages detached/
Pages détachées
- Showthrough/
Transparence
- Quality of print varies/
Qualité inégale de l'impression
- Includes supplementary material/
Comprend du matériel supplémentaire
- Only edition available/
Seule édition disponible
- Pages wholly or partially obscured by errata slips, tissues, etc., have been refilmed to ensure the best possible image/
Les pages totalement ou partiellement obscurcies par un feuillet d'errata, une pelure, etc., ont été filmées à nouveau de façon à obtenir la meilleure image possible.

This item is filmed at the reduction ratio checked below/
Ce document est filmé au taux de réduction indiqué ci-dessous.

10X	12X	14X	16X	18X	20X	22X	24X	26X	28X	30X	32X
					✓						

The copy filmed here has been reproduced thanks to the generosity of:

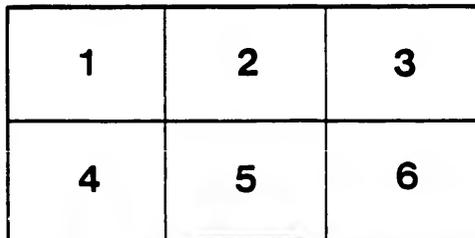
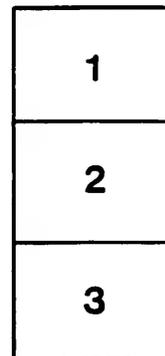
D. B. Weldon Library
University of Western Ontario
(Regional History Room)

The images appearing here are the best quality possible considering the condition and legibility of the original copy and in keeping with the filming contract specifications.

Original copies in printed paper covers are filmed beginning with the front cover and ending on the last page with a printed or illustrated impression, or the back cover when appropriate. All other original copies are filmed beginning on the first page with a printed or illustrated impression, and ending on the last page with a printed or illustrated impression.

The last recorded frame on each microfiche shall contain the symbol \rightarrow (meaning "CONTINUED"), or the symbol ∇ (meaning "END"), whichever applies.

Maps, plates, charts, etc., may be filmed at different reduction ratios. Those too large to be entirely included in one exposure are filmed beginning in the upper left hand corner, left to right and top to bottom, as many frames as required. The following diagrams illustrate the method:



L'exemplaire filmé fut reproduit grâce à la générosité de:

D. B. Weldon Library
University of Western Ontario
(Regional History Room)

Les images suivantes ont été reproduites avec le plus grand soin, compte tenu de la condition et de la netteté de l'exemplaire filmé, et en conformité avec les conditions du contrat de filmage.

Les exemplaires originaux dont la couverture en papier est imprimée sont filmés en commençant par le premier plat et en terminant soit par la dernière page qui comporte une empreinte d'impression ou d'illustration, soit par le second plat, selon le cas. Tous les autres exemplaires originaux sont filmés en commençant par la première page qui comporte une empreinte d'impression ou d'illustration et en terminant par la dernière page qui comporte une telle empreinte.

Un des symboles suivants apparaîtra sur la dernière image de chaque microfiche, selon le cas: le symbole \rightarrow signifie "A SUIVRE", le symbole ∇ signifie "FIN".

Les cartes, planches, tableaux, etc., peuvent être filmés à des taux de réduction différents. Lorsque le document est trop grand pour être reproduit en un seul cliché, il est filmé à partir de l'angle supérieur gauche, de gauche à droite, et de haut en bas, en prenant le nombre d'images nécessaire. Les diagrammes suivants illustrent la méthode.

Middlesex County

SCHOOL HYGIENE.

AN ADDRESS

DELIVERED BY MR. J. DEARNESS, PUBLIC SCHOOL INSPECTOR,
AT A JOINT SESSION

—OF THE—

London Sanitary Convention,

HELD UNDER THE AUSPICES OF THE

PROVINCIAL BOARD OF HEALTH

—AND THE—

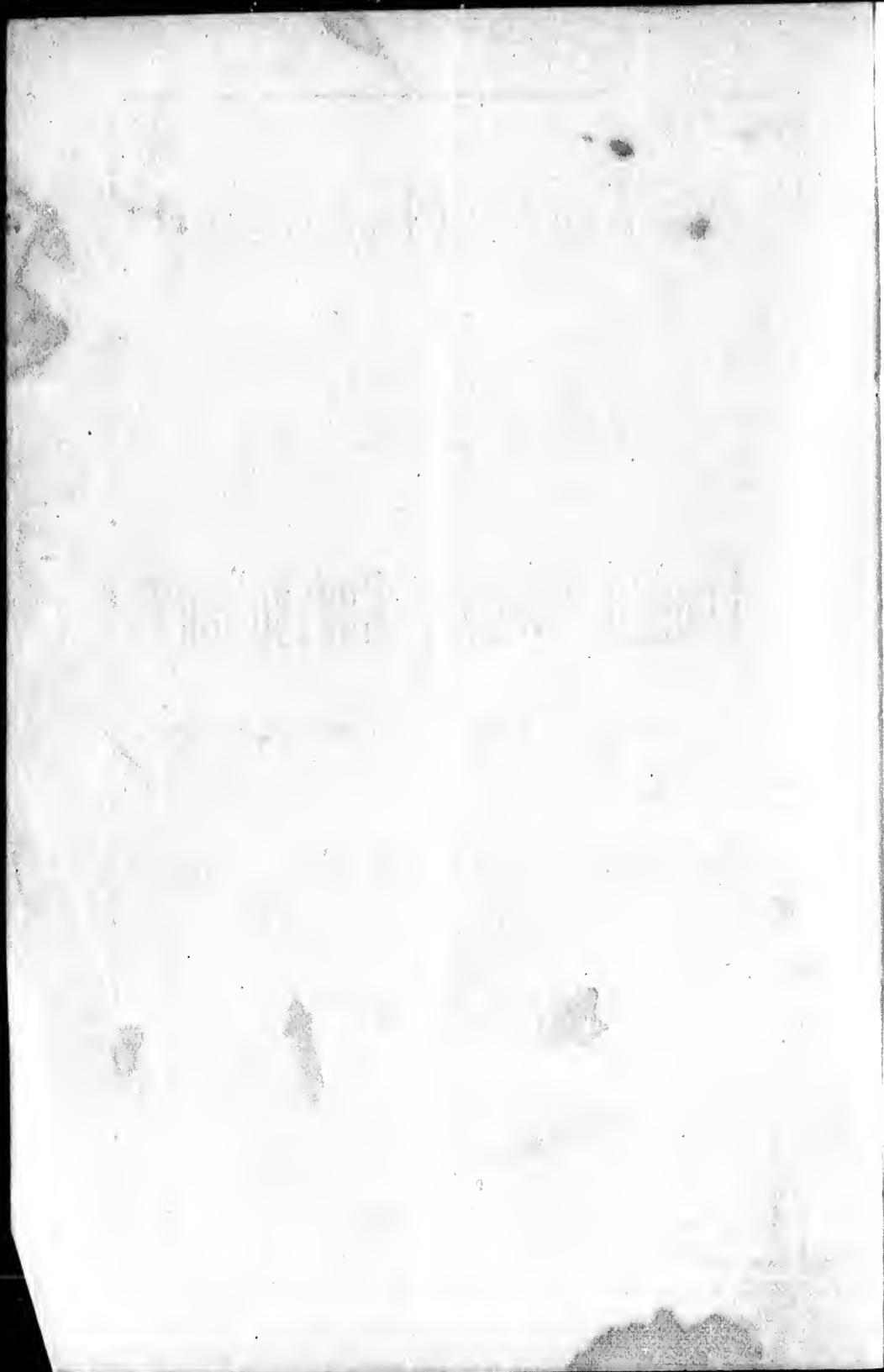
East Middlesex Teachers' Association,

—AT—

LONDON, 17th NOVEMBER, 1883.

PRINTED BY ORDER OF THE
EAST MIDDLESEX TEACHERS' ASSOCIATION.

Lawson & Jones, London East.



SANITARY CONDITION

— OF —

RURAL SCHOOLS.

Martial, the father of epigrammatists, crystallized a large part of the human experience of his day in the short sentence: *Non est vivere, sed valere vita*—"Life is not living, but the enjoyment of health." After the experience of seventeen centuries more, our own poet, Thomson, sung: "Health is the vital principle of bliss." No doubt the paramount importance of health to happiness will be acknowledged to the end of time. It is universally admitted to be easier to preserve health than to recover it, that health once lost is difficult or impossible to regain; yet few seem to think about preserving it until they find that they are losing or have lost it. To get and keep wealth a hundred times as much trouble and anxiety seem to be exercised as to get and keep health; but let disease lay hold on the money-seeker, and you may see him eager to spend his last dollar, could it but purchase that which he carelessly lost or deliberately threw away.

The life and health of the young occupy only a small proportion of the attention which they deserve. A funeral cortege passed along Talbot street the other day. Some one inquired, "Whose funeral?" Reply was made, "It's only a child's." The answer does not strike one as unfamiliar. The public mourns the departure of a life whose work seems to us well-nigh accomplished; but the loss of the life of a child with all its unfolded possibilities is deplored only by the household. Indeed some good people talk as if they thought one of the chief uses of children is to afford the Father of all Good a means of visiting on families blessing in affliction. Strange that God, while He walked on earth, manifest in the flesh should delight in daily moving among the people blessing the children, raising the palsied, casting out devils, and healing all manner of diseases, as was read in our hearing this morning, but, that God in heaven should look with complacency on the suffering of our little ones prostrated on beds of racking pain that they cannot understand at all, for the sole benefit of us older sinners. No; the truth taught us by statistics is that over one-fourth of all the lives God gives our race are sacrificed in early youth to the devils of sin and ignorance and uncleanness (foul air).*

Much mischief comes from the over-estimation of the strength and hardiness of youth. On a chilly day in late September thirty children sat in an unwarmed school-room, the little girls shivering, their cheeks and lips blue with cold. A trustee of the school when told that "the stove should be put up at once or those children will get their death of cold," replied "Oh, they're young and strong; when I was like them I could stand anything." It is in youth that the seeds of invalidism and weakness are often planted, and in no other period of life is greater precaution necessary for the preservation of health. Begin to train a man when he is young

*Out of 22,208 deaths registered in the Province of Ontario in 1881, the latest year for which a report is published, 9,510 deaths, or 43 out of every 100, were of persons under 11 years of age. For the preceding five years the percentage of deaths under 11 years has varied from 39 to 44!

to live long and well. The fallacy that the only care growing boys and girls require is to be dosed and nursed through whooping-cough and measles must be eradicated before the mission of the sanitarian is fulfilled.

I have read somewhere that infant mortality in old London has decreased by one half since mortuary statistics were first compiled. So much for the progress and benefits of sanitary science. But the high rate of mortality among children yet found even in the most favored districts and countries is a disgrace to our civilization. Nations and politicians should be keenly exercised over the frightful facts revealed by these tables of mortality. It is difficult to estimate the pecuniary value to the nation of an average life. We know that before the American war the slave-dealer thought an able-bodied black worth from 1,500 to 2,000 dollars. Perhaps no one here would venture to estimate the millions of dollars lost to our country by preventable mortality; yet it would not be a long sum in addition to tell how much the Government spends annually in the only effective remedy, the diffusion of hygienic knowledge among the masses. I am a politician who believes it is the duty of our country to spend more money on preserving the lives we have and less on the importation of foreigners. Herbert Spencer truly writes: "To the tens of thousands that are killed and the hundreds of thousands that survive with feeble constitutions, add the millions that grow up with constitutions not so strong as they should be and you will have some idea of the curse inflicted on their offspring by parents ignorant of the laws of life. Consider but for a moment that the regimen to which children are subject is hourly telling upon them to their life-long injury or benefit, and you will have some idea of the enormous mischief that is almost everywhere inflicted by the thoughtless, haphazard system in common use." It is too true that few in middle life are in the enjoyment of continuous vigorous health, and could a thorough investigation be made it would most probably be found in respect to the majority of the others that the seeds of their disease or weakness were sown in childhood. How often do we see an apparently strong man succumb in the prime of life to some malady or epidemic to which others are equally exposed yet escape. The immediate cause of his death is charged to the disease, but who can say that the cause of inability to resist it does not date back as far as or further than his school-days.

Seeing, then, that such tremendous issues hang on the right preservation of the health, and the proper development of the strength of youth, it is fitting that this convention should give earnest consideration to the subject of school hygiene, which is second in importance to only one other subject that could occupy your attention—the hygiene of the nursery.

I have endeavored to make this paper supplementary to an able address on School Hygiene delivered by Dr. Oldwright before the Provincial Teachers' Association, which I hope may be printed in the Annual Report of the Board of Health, where it would be read by many who may not see the printed proceedings of the Teachers' Association.

School Hygiene naturally admits of treatment under two classes of topics, one referring to the character and conditions of the school house and its appurtenances, the other to the exercises specially designed and practised to promote the health and develop the strength of the children. It is to the former class of topics

chiefly and as rural schools particularly are affected, that I now invite your attention. These topics will be treated in the following order:

- 1st. Site.
- 2nd. Ventilation and Warming.
- 3rd. Water-supply.
- 4th. Sewerage.
- 5th. Furniture.
- 6th. Cleanliness
- 7th. School age.

SITE.

In rural sections where land is comparatively cheap and choice not confined to one particular spot, there is seldom excuse for locating the school in an unwholesome or unsuitable situation. In my district about eight per cent. only of the schools are located in unnecessary proximity to swamps or stagnant water, or on sites extremely difficult or impossible to drain properly. Very few sites contain less than half an acre, still fewer more than one acre. A site of two or three acres with ample room for wood shed, play shed, out houses, rows of trees, flower plots and a teacher's residence exists only in the dominion's dreams. Not very many of the sites are drained and very few have suitable provision for outdoor play and exercise in wet and stormy weather. Trustees seem in selecting a site to bestow more attention on its elevation than on its aspect. If it costs a few dollars more to purchase a site affording a southern aspect for the school-house than one that makes the school open towards the north, they buy the cheaper. On the roads running east and west in the district there are nearly as many houses facing the north as the south. The former are, as a rule, colder and more comfortless, with a larger consumption of fuel, and consequently greater expense therefor; and in such there are more trouble and more necessity to keep the outside porches and storm-doors in good repair. They lack the genial and health-giving influence of an open door way filled with sunlight on the bright spring days; the front yard remains damp and muddy much longer and the flower-beds, where such are made, are not so attractive.

VENTILATION AND WARMING.

The problem of ventilation is at once the most important and difficult with which school authorities have to deal. In a school favorably situated and equipped from a sanitary point of view, the pupils—educated by the ideal teacher, intellectually, morally, aesthetically and physically—ought to grow wiser, better, happier and stronger every day. Ordinarily the most of them do grow wiser; but do they grow stronger and healthier? In Dr. Oldwright's paper, already referred to, he answers the question by simply pointing to the contrast between the appearance of the children at the close of the school-term and at the re-opening after the vacation. The same answer is given by contrasting the school at the beginning and close of winter. By parity of reasoning you would expect to find the appearance and condition of the children more favorable in March than in June, but anyone acquainted with rural schools at least, knows that the contrary is the case. The open window suspends the rule. Why is it that in the winter season when other people are gaining weight and vigor, school-children and teachers are losing energy and appetite. The trustees and people are proud of their substantial, air-tight, comfortable brick school-house.

Forty, fifty, even sixty or seventy children assemble, school is called, the day is chilly or cold, and consequently the doors and windows are all closed. How long is the air in that room fit for respiration? About ten minutes. What then? Breathe it over and over again; and so the process of devitalization and poisoning goes on and on. "But they're young; they can stand it." Recess comes and gives temporary relief. Fortunately it is a difficult matter to keep doors shut at recesses and noon-hours.

Analysis of ordinary out-door air shows that it always contains about $4\frac{1}{2}$ parts of carbonic acid in 10,000. The analyses of air made under the direction of the "Health of Towns Commission," appointed by the British Government, showed that the air in the streets of Manchester, perhaps the smokiest city in the world, contained varying proportions from 6 to 15 parts in 10,000. Other analyses furnished the following figures: a stable, 7 parts in 10,000; another stable, 14; a crowded railroad car, 34; a close bed-room in the morning, 48; a crowded lecture-room at the close of a lecture, 67; and, *worst of all, a school-room, 72 parts in 10,000.* Dr A. Endemann, an analytical chemist of New York, at the direction of the Board of Health made analyses of the air taken from several of the city schools. He certified that an examination of the air in one of the class rooms, while one of the windows was open, gave 17 parts of carbonic acid in 10,000; the window was closed ten minutes, another examination of air taken then yielded 32 parts and he adds "if the accumulation had been allowed to continue we might have reached within an hour the ratio of 110!" Dr Dalton, the physiologist, says air can no longer sustain life when the proportion of carbonic acid reaches 200 parts in 10,000. Hence it is no hyperbole to say that when the proportion of carbonic acid reaches 100 parts in 10,000; *i.e.*, 1 cubic foot in 100, as probably quite frequently occurs, the children and teacher are *half* dead

But were our children living in school-rooms and sleeping rooms, the atmosphere of which were vitiated by ten times its normal quantity of carbonic acid only the case would not be so serious as it is. Dr. Carpenter writes that "the true poisonous agent which produced such fatalities as the Black Hole of Calcutta and others of a like kind is the organic matter which is always found in air rendered fœtid by the prolonged respiration and the cutaneous exhalations of a crowd of human beings, and the deficiency of the oxygen and the consequent increase of putrescent matter in the body." Through Mr. Alexander, of Galt, I quote from Dr. Billings, Surgeon-General of the United States Army: "The really dangerous and oppressive impurities are the organic matters thrown off in respiration, and as these increase the carbonic acid increases in like proportion. Now the testing for these organic matters in a quantitative point of view is a very difficult and delicate process, whereas the examination for carbonic acid is comparatively simple; hence the chemical test of the quality of the air is made by the analysis for carbonic acid, which is taken as an index for the really harmful impurities existing." Prof. Leeds says, "the young active, growing brain demands the purest and the best air and is most sensitive to foul air." Another eminent authority writes: "In all climates and under all conditions of life, the purity of the atmosphere habitually respired, is essential to the maintenance of that power of resisting disease, which, even more than the ordinary state of health, is a measure of the real vigor of the system. For owing to the extraordinary capability, which the human body possesses of accommodating itself to circumstances, it not unfrequently happens

that individuals continue for years to breathe an unwholesome atmosphere without apparently suffering from it, and then when they at last succumb to some epidemic disease their death is attributed solely to the latter, the previous preparation of their bodies for the reception and development of the zymotic poison being entirely overlooked."—*Carpenter's Physiology*, page 326.

"The poisonous effluvia which pervades the atmosphere is not only re-breathed, it adheres to all the surroundings; it sticks to the floor, walls and furniture, and permeates the clothing. Besides lessening the vital force it predisposes to blood poisoning and becomes a hot-bed for the reception and propagation of such poisons as scarlet fever, measles, diphtheria and a source of scrofula and consumption"—*Dr. Bell in the New York Sanitarian*.

But it is useless to multiply authorities. The effects except in a few cases are so far removed in point of time and circumstance from the causes, that the public cannot be alarmed. One view of the case might be closely pressed as it is more easily seen, and strikes home in so many quarters, that is the influence of the school atmosphere as a prolific source of consumption proved by its influence on the health and life of teachers. I know of thirteen teachers who have died, as the saying is, "in the harness;" five by accident, and every one of the others by consumption.

Dr. Workman has made a careful estimation from the tables of the Registrar-General and arrives at the conclusion that the average life of the teacher is 38 10-12 years; and further, from the same tables, shows that the proportion of deaths among teachers from consumption is greater than among sempstresses and, in fact, lower than in only one other occupation. If, then, life in the school-room is so prejudicial to the health of the adult teacher, what must it be to the tender undeveloped child? The cause is not far to seek. Dr. McCormack of Belfast, in his work on the relation of re-breathed air to pulmonary consumption, asserts that it (re-breathed air) is the sole and constant cause of this disease. Prof. Leeds says "consumption is almost entirely the result of re-breathed air; and that it is as preventable by the exclusive use of pure air as *mania a potu*—drunkenness—is by the exclusive use of pure water.

EXPEDIENTS FOR VENTILATION.

Medical and scientific authorities agree that school-rooms should be provided with 1,000 cubic feet of air space per pupil, and also with the means of changing that amount three times per hour. I do not know of any school house so well provided. The average cubical capacity of the rural schools in this division is 267 cubic feet per pupil. Thirty-two per cent. have ventilators in the ceiling. The chief purpose served by these is to make the school cold in the winter. Nine per cent. are fitted with flues or ventilators in the walls or chimneys. I have tried to get trustees to have the upper window sashes adjusted so that they can be lowered and closed. Seventy-nine per cent. of the schools are now fitted with movable upper window sashes, but only about fifty-five per cent. with window sashes hung by weights over pulleys, and I find in practice that it is only the latter which are made really effective for the purposes of ventilation. Two schools have stoves enclosed in jackets which are supplied with currents of fresh air by ventiducts leading from the outside. Ventilation by the windows is the most common method. Unfortunately some teachers exercise but little judgment

In using this means. Occasionally one finds a window opened on the windward side of the school house, and the breeze blowing strongly against the heads of the children sitting near it. Teachers should ever hear Dr. Angus Smith's warning ringing in their ears: "though foul air is a slow poison, a blast of cold air may slay like a sword." The death of a delicate child attending a school adjoining the city resulted from exposure to draft. A few weeks ago I was informed of the case of a boy who contracted congestion and inflammation of the lungs by sitting near a drafty window in our city high school. The case was so serious that for several days the doctor and friends despaired of his recovery. Windows should always be opened on the leeward side of the house, unless they are provided with appliances that will give the draft sharp upward deflection. The latter object is accomplished by placing a strip the length of the window frame, the width of the opening, and the thickness of the frame under the lower sash. The raising of the under sash accomplished in this way makes an entrance for the air between the sashes. It is less trouble to fix a strip of board under the top of the frame at a sharp angle with the top bar of the upper sash, and then lower the sash. If the window is on the windward side it may then safely be lowered an inch or two, or if on the leeward side pulled down to make an opening of eight or twelve inches. Ventilation, by heating air drawn by flues from the outside in a chamber constructed round the stove, is an excellent method, but the chamber should be fitted to the stove in such a way as to expose part of the metal so that wet or cold feet can be dried or warmed at it. Speaking of ventilating flues it may be safe to state as a rule they are practically useless in rural schools unless they are warmed by the smoke flue's passing through them, or heated in some other way. It is really surprising to find how many people think cold air and pure air are identical. I have several times, on complaining of the ventilation of the room, heard the command given a pupil to "close the damper."

One seldom sees an evaporating pan on the stove or any other means adopted to maintain the proper hygrometric condition of the air in the school-room. It is not generally known that external air at freezing point brought into a room heated to 65° or 70° requires at least four times as much moisture as it contained outside.

"I wish I had time," said Prof. Leeds, in a lecture before the Franklin Institute, "to explain the dreadful effects of this want of moisture in all our artificially heated rooms. The air in winter is very dry, the moisture is squeezed out as the water is squeezed out of this sponge. But as you heat it you enlarge its volume again, and it sucks up the moisture just as this sponge does, and if you do not supply this moisture in other ways it will suck the natural moisture from your skin and your lungs, creating that dry, parched, feverish condition, so noticeable in our furnace and other stove-heated rooms. Few persons realize the amount of water necessary to be evaporated to produce the natural condition of moisture, corresponding with the increased temperature given the air in many of our rooms in winter. Air taken in at ten degrees and heated up to seventy, the ordinary temperature of our rooms, requires about nine times the moisture contained in the original external atmosphere, and if heated to a hundred degrees, as most of our hot air furnaces heat the air it would require about twenty-three times the amount in the external atmosphere."

In concluding my remarks on ventilation, I give the common and simplest test for excess of carbonic acid. Fill an 8 oz. vial with pure water (rain or distilled); empty out the water in the room the air of which you desire to test. Emptying the bottle of water allows it to fill with the air of the room. Pour into the bottle $\frac{1}{2}$ oz. clear lime water and shake thoroughly. If there is no perceptible milkiness or turbidity the air does not contain more than 8 parts carbonic acid in 10,000. If a half oz. of lime water shows turbidity in a 6 oz. bottle, there is at least 11 parts in 10,000; if the same in a 2 oz. bottle shows turbidity, it indicates upwards of 40 parts in 10,000.

WARMING.

The usual method of warming rural schools is by a cast iron box-stove placed near the front door. In a very few cases it is screened to protect the pupils whose seats are near the stove from the direct radiation of the heat; but usually no such protection is provided; nevertheless pupils—salamanders they might be called—are found willing to sit all day in close proximity to the hot stove. Some teachers, pupils, and parents do not seem to have the least idea of the great danger of sitting for hours in a temperature of 100 degrees, and then running out into the cold, with little or no extra wrapping. If pupils have to sit near the stove trustees should see that it be screened by some means. The *Scientific American* has highly recommended an open ventilating stove called the "Fire on the Hearth;" and I have read strong recommendations by Prof. Johnson, author of "School Architecture," and some Normal School Principals, of that or a similar ventilating stove for use in schools. It is evident that a heater, combining the advantages of a box-stove and an open fire-place, is a *desideratum* for the school-room. This is a point which I hope will be discussed at this meeting.

Not many rural schools are supplied with a thermometer. Where it is supplied it must usually be regarded as more ornamental than useful. I knew of one case, but only one, where the "stove-monitor" took his stoking orders, not from the teacher, but from the silent monitions of a thermometer. His instructions were to keep the mercury between 63 and 70 degrees. Every school-room should have one or two thermometers, not for show but for daily use. Teachers should be particular that no child sit long in a part of the room that is either much too hot or too cold.

A few old-fashioned teachers still retain a practice that was once quite common—that of writing, classifying and numbering the "Rules of the School," and posting them up in the room. The practice is becoming obsolete, because the modern teacher is finding out that there is more law and rule written in the heart and conscience of a child than he can post on the back of the biggest door. But I once saw a catalogue of "Rules, Offences, and Punishments," that had in it a rule, not written in the conscience of the average school-boy, and which, I fear does not often cross the mind of many a better teacher than the maker of the rule. It was this: *No scholar may sit in school with wet feet.* "How do you enforce this rule?" "When I think occasion requires it, I say, after assembling: 'All in the room with wet feet, stand up.' Those who stand have either to put their stockings under the stove or go home to change them." If such a rule as this were generally observed, children would become less careless about getting their feet wet, and they would not have nearly so many colds and allied complaints. On

days when mothers may know, from the condition of the weather, roads, or shoes, that their children can hardly avoid getting their feet wet they ought to provide them with an extra pair of stockings to be exchanged for the wet ones on their arrival at the school-house. Few causes will more certainly produce sickness than sitting all day with wet feet resting on a cold floor.

LIGHTING.

A few years ago it was not uncommon to place windows in the end of the room in front of the children. But the increase of hygienic knowledge and the demand for more blackboard have almost removed this evil. In Germany, by law, light must be admitted either from the ceiling or from one side only, and the seats and desks must be placed so that when the pupils are reading or writing the light will be supplied from their left. The height of the window-sills from the floor should always be as great as possible. The nearer the approach to lighting from the roof the better. Robson, the best English authority on the subject, says the sills should never be less than five feet from the floor, and may be even more with advantage both for lighting and ventilation. Dr. Linell, of Norwich, Conn., who has studied the subject very carefully, says that windows should always be on the *side* of the room, and that there should be thirty square inches of window space to every square foot of floor space. He has recently examined the eyes of 700 school children varying from 7 to 18 years, and found that only 61 per cent. of them had normal vision. In that number there were 87 cases of myopia, the ratio of myopia increasing with the ages of the scholars. Much responsibility rests on the teacher in this matter. Diseases of vision from causes peculiar to the school-room most frequently arise from improper postures of the body, and wrong habits of holding the book. The teacher must be blamed if the children, during the writing exercises, crouch down over the desk until their noses are within two or three inches of the slate or paper.

WATER SUPPLY.

In rural schools, even more than in urban, a plentiful supply of wholesome water is necessary, because the children at the former do not go home for their dinner, but at the noon hour eat a dry luncheon, generally swallowed hurriedly, as they are in haste to proceed with their play. I say *generally*, because a few teachers require the children at the beginning of the noon recess to get their dinners from their baskets, return to their seats, spread a napkin or piece of paper, and, in an orderly manner, partake their repast before they go out to play. Sitting in a dry, hot room produces thirst; this, many of the children increase by bolting a luncheon at intervals in the middle of exciting play, and that, during the warmest hour of the day in the summer; consequently they drink a comparatively large quantity of water. They are often not over fastidious as to the quality of the liquid with which they wash down their luncheons or quench their thirst. If the pump is not in working order, or the pail be empty, they eat snow or run to the nearest spring. I have heard of their dipping water out of the road-side ditch. A good well in the school-yard is invaluable. It ought to be carefully lined with stone or brick; the upper part of the lining should be laid in water-lime to make it impervious to soakage from the surface or the burrowing

of rats, frogs, etc.; it should be supplied with a strong pump, having a "let-off" below the reach of the frost that cannot be closed summer or winter. It should be covered with an absolutely close covering, laid on with sufficient slant to run the waste water off. Your thirst would be great if you could drink the water after seeing three or four children standing with dirty feet at the pump spout, washing their sweaty hands and faces and all the washings audibly trickling down into the well. Under no circumstances should be omitted the duty of pumping the well empty, if possible, two or three times a year, or at least just after the spring thaw and again at the end of the summer vacation.

The plan of carrying water in a pail from a neighbor's is not to be commended. The supply is apt to be irregular and insufficient, not to speak of the annoyance and inconvenience often occasioned to the neighbor whose well is thus appropriated by the school section. The corner of the school-room where the pail stands is often in a disgusting condition. The leavings are thrown on the floor, dust sticks, filth collects, at last mud has the monopoly. Then the school-pail; it is enough to say it is usually wooden and unacquainted with hot water. The pail plan should be tolerated only when it is impossible to get pure water on the school ground. The probability of getting good water should invariably be considered in the selection of a site.

In this division last spring I found that 45 per cent. of the schools were supplied with wells and pumps in working order. Twenty-eight of these—more than half—were considered pure and wholesome, eight of them doubtful, and the rest were pronounced bad and unfit for drinking purposes. Thirty per cent. depended entirely on the neighbors. In some of these cases the water is carried in a pail, whether the snow is deep or the roads hot and dusty, for a quarter of a mile or more. The remainder drew their supplies from springs, resorted to expedients that came most convenient such as eating snow, or did without altogether. Nothing about the average school seems to receive more severe letting alone from those whose duty it is to keep them in order than the school well and privies. Not one well in twenty is properly lined and covered, consequently it soon needs cleaning; the cleaning is neglected; it goes from bad to worse; the well gets a bad name, and it not unfrequently happens that it is allowed to cave in and gradually fill up.

Before the summer holidays I mailed a circular to every school section, from which the following is an extract: "When decaying earth worms, frogs, snakes, rats, sewerage or rotten wood is in the well the water becomes unwholesome, and the well should be cleaned out. Perhaps the best test for such organic impurities, in inexpert hands, is to put one or two drops, or enough to give a pink color, of a solution of permanganate of potash in an ounce vial of the suspected water. The solution should be of the strength of eight grains of permanganate to an ounce of pure water—distilled water or filtered rain water caught in the open, or the London waterworks water will do nearly as well, if more convenient than the others. If the water be unfit for drinking, the color will be discharged or bleached in about twelve hours, and usually the impurity may be seen precipitated at the bottom of the vial. The test is more satisfactory if a similar bottle of pure water be treated the same as the suspected sample and placed alongside it for comparison." In some cases where this simple test was applied it resulted

in the well's receiving a thorough cleaning. The average distance of the nearest privy from the school well in this district is 39 yards. I have not heard many complaints of the pollution of the water from this cause. In one school section, No. 20 London, where diphtheria violently broke out, the head of a family that lost five members told me that he attributed the disease to the proximity of the school well to the site of an old filled up privy vault. This brings me to the subject of

SEWERAGE.

The description of the out premises of country schools given by Prof. Church, of Greenville, at the Sanitary Convention held there last year, is so graphic and generally applicable that I cannot help repeating it here. He said: "On many school premises one may see a mean, dilapidated building, bearing all possible marks of disrespect and execration, remote from the school-house, difficult of approach to sensitive pupils at all seasons of the year on account of its publicity. In the winter the snows sift in at numerous crevices; the northern blasts make it a veritable cave of the winds; in winter it is as comfortless as an iceberg; in summer as malodorous as Tophet." One of the particulars he enumerates is not so generally applicable as the others, that is the remoteness. I know several cases where more remoteness would be very desirable. Most people have a lively fear of drinking water contaminated by such sewage, but few fear disease from air thus polluted. An illustration of death and disease from the latter cause occurred at Pittsfield, Mass. Partly because of its boasted salubrity a ladies' seminary was established there and well patronized. But through ignorance or carelessness foul gas from the vaults and cesspool at times pervaded the building, and as a consequence, fifty-one out of the seventy-seven young ladies in the institution were attacked with typhoid fever, of whom thirteen died. Thorough investigations, conducted by Doctors Palmer, Ford and Earle, proved that the polluted air was the cause of the epidemic. In most cases the rural school closet consists of a vault over which is constructed a small frame building. These usually last for many years without being emptied or disinfected. I am sure they are a source of much harm and danger to the health of the children. The system ought to be radically changed. The old-fashioned vault is falling into disrepute with sanitarians everywhere. No class would hail a practicable reform of this evil more heartily than school-trustees. I believe they would readily adopt an inexpensive dry-earth closet if its working could be clearly explained, and its advantages shown.

The official regulations on school accommodation require that there be separate offices for the sexes, and that the entrances be screened from view. In this district there are three schools out of the hundred with only one closet; only about 35 or 40 are properly screened from the general play-ground and school windows. Four have urinals attached to the boys' closet. These are useful in keeping the seats clean. Nine are reported to be regularly disinfected, the disinfectants being lime, chloride of lime, road-dust, or ashes.*

*DISINFECTANTS.—Chloride of lime,—sprinkle around dry; copperas (sulphate of iron).—dissolve in the proportion of one pound in a gallon of water, and wash or sprinkle with the solution; whitewashing with lime.—put some copperas solution in the whitewash. The chloride of lime is put up in close half-pound boxes at 5 cents each; copperas is about 5 cents a pound.

FURNITURE.

Reference will be made to seats and desks only. In this particular, I believe East Middlesex is the most favored county in the province. The seat and desk best combining convenience, comfort, elegance and cheapness, that I have ever seen, is a pattern manufactured by Bennett Bros., London East. It is adopted in about one-third of the schools of this district. The seats in nine of our schools are very ill-constructed, they slope downwards to the front; in twenty-one schools the seats are so high that many of the smaller children cannot while sitting back on the seat, rest their feet on the floor; in ten schools the desks are so low, and the seats so high, that their occupants cannot maintain while writing or ciphering, a properly erect position. None except those of the pattern referred to, are constructed with proper curvature of the seat and back suited to preserve the natural shape of the body.

The importance of correct seating can hardly be overestimated. "To the badly constructed seats and desks," says Dr. J. C. V. Smith "we can trace in some measure the cause of so many distortions of the bones, spinal diseases, and chronic affections now so prevalent throughout the country." Another authority Dr. Woodward, blames defective school seating as the cause of numerous instances of deformity of the spine, especially with delicate female children. In rural schools there are always pupils of widely varying size and age, and consequently there should be three or four sizes of seats and desks in all such school rooms. The seat should be placed so close to the desk that the inside edge of the latter should slightly lap over the front of the former.

CLEANLINESS.

On a little reflection one would naturally conclude that few houses require to be more frequently and thoroughly swept, dusted, scrubbed, and whitewashed, than a school-house. But I am ashamed to confess that few inhabited houses are more neglected in some of these respects than the average school. One of my schools is swept twice a week, six three times, two four times, and the rest daily. In nearly half the schools, the trustees leave the sweeping to be done by the children and teacher. In such cases it is generally done at noon, and often children may be dimly seen eating their luncheons in a cloud of dust. Not more than a third of the teachers report provision for dusting, after the dust has had time to settle; hence in most cases, the proportion of it that is not inhaled by the children, or settles on the floor, is wiped up by the children's clothes when they use their seats and desks. One teacher reports that his school has been scrubbed only once in five years, another twice in five years, and a third that neither he nor the pupils know when it was last scrubbed, in fact that there is no record that it has ever been scrubbed. The average number of times the school houses in this district have been scrubbed is four times in three years. I have no statistics on whitewashing, but I do not think the schools are whitewashed on an average more than once in four years. Two of my schools have been finished in rough plaster which is marked off to represent stone. On their rough walls the dust and effluvia of the last ten years at least, have found an easy and undisturbed resting place. My reports and recommendations in favor of whitewashing are usually made in vain. It is not that trustees are afraid of having their school-houses too wholesome, bright, and cheerful, but that they have great difficulty in getting men to do the work for what they are willing to pay.

Some of our rural schools are clean, sweet, bright, and attractive, tastefully adorned with motto, picture, and flower, but the number of such is too few. The description I have given portrays as correctly as I am able, the average surroundings from a sanitary point of view of the schools in this the best county of the Province.

In view of these facts, you will agree with me that the Provincial Board of Health has ample opportunity to effect much good by disseminating a knowledge of sanitary science applicable to our public schools.

SCHOOL AGE.

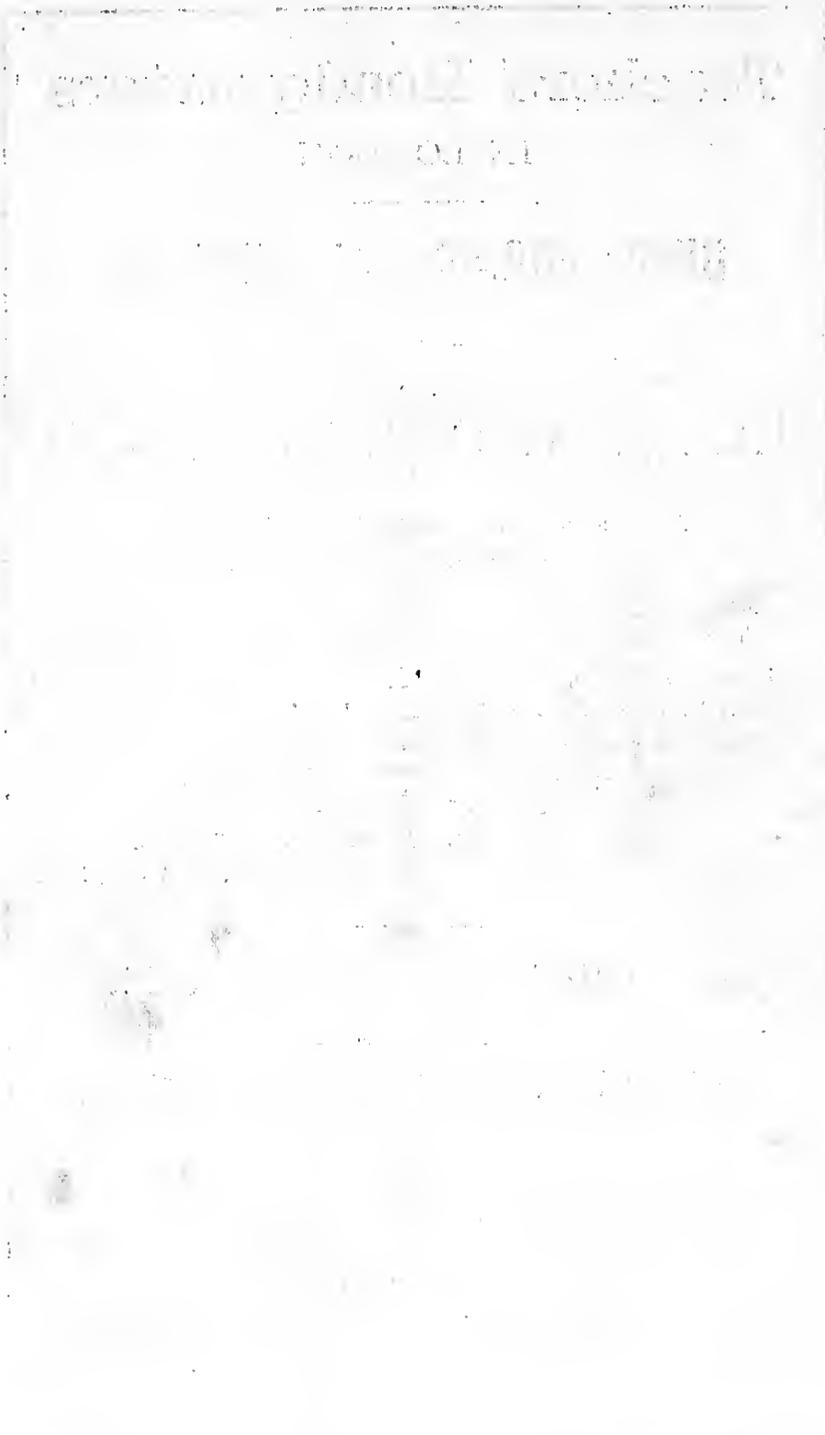
In conclusion, I ask a discussion on the question of the best age for the commencement of systematic education. My more limited experience corroborates that of Superintendent Harris of St. Louis, who says that children entering school at the age of eight years, are generally further advanced at thirteen than those entering at five. I have read that while the gray matter of the brain is but partially developed, no exercise of the reflective faculties or mental efforts involving exercise in abstract ideas should be allowed,—that all formal labor of the mind required before the seventh year, being in opposition to the laws of nature will prove injurious to the mind. Further that such ossification of the lower vertebrae of the spine as will permit much resting of the body in a sitting posture, without injury does not take place until the seventh year. If these statements be facts, the conclusion is inevitable that the minimum school age should be increased from five years as at present, to seven years at least. I am convinced by reasons other than the above, that a child but five years old is too young to commence school. If we increase the minimum age to six years, we shall be in company with fifteen of the United States in this matter, and still a year below the minimum age prescribed in France.

The belief is gaining that intellectual contraction, and even moral obliquity can be traced directly to bad digestion. Let us spread the belief. If parents were as anxious to rear their children good vigorous animals as they seem to have them intellectual prodigies or prim fashionable young misses, it would be vastly better for the race. Even the school-master might rejoice, for his work of educating would be thereby rendered far more easy and successful. Were our boys and girls to live amidst favorable, physical, mental, and moral surroundings, until they are fourteen or fifteen years of age, then—even were all props and guards torn away—they would in all likelihood continue to grow straight and strong. To accomplish this end, may you put forth every effort, and not weary until finally you or those who wear your mantle will be rewarded with complete success. Speed the time when dyspepsia and hypochondria will give way on every hand to vigorous digestion, the bounding pulse and their accompanying high spirits; when the *mens sana in corpore sano* will be the rule and not the exception; when instead of that formidable list of two hundred and forty-nine diseases classified in your first annual report, the number may in your last be reduced to euthanasia in old age, and perhaps *thanatici*.

y
●
l-
●
d
-

●
r-
g
n
is
s
of
of
e
g
e
re
n
o
ll
ar

ty
ts
re
ly
u-
ys
gs,
nd
nd
ry
ote
on
y-
he
ne
be



Teachers' Headquarters

IN LONDON.

—o—
DEPOT FOR SCHOOL SUPPLIES.

—◆◆◆—
JAS. I. ANDERSON & CO.

Are in a position to supply all School Requisites
at the lowest possible prices.

The following are a few of the leading lines:

SCHOOL BOOKS,

MAPS and TABLET READING LESSONS,

GLOBES, NUMERAL FRAMES,

SLATING FOR BLACKBOARDS,

CHALK CRAYONS,

BLACKBOARD BRUSHES,

PRIZE BOOKS, BIBLES, Etc.

—o—
Agents for Stafford's School Ink, PRICE 400. PER QUART.

—PUBLISHERS OF—

ROW'S GRADED EXERCISES IN ARITHMETIC,

PRICE 15 CENTS.

Orders by mail promptly attended to.

ADDRESS:

175 Dundas St., LONDON, Ont.

