(4.) *Well; Proper Conveniences.*—Whether a well or other means of procuring water is provided; also, whether there are proper conveniences for private purposes of both sexes on the premises; and whether the regulations in regard to them, contained in regulation 6 of the "*Duties of Masters*" and regulation 9 of the "*Duties of Trustees,*" are observed.

Regulation 6.—*Duties of Masters in regard to School Premises, &c.*—The trustees having made such provision relative to the school house and its appendages, as are required by the *fourth* clause of the *twenty-seventh* section, and the *seventh* clause of the *seventy-ninth* section of the Consolidated School Act, and as provided in regulation 9 of the "*Duties of Trustees,*" it shall be the duty of the master to give strict attention to the proper ventilation and temperature,* as well as to the cleanliness of the school house; he shall also prescribe such rules for the use of the yard and outbuildings connected with the school house, as will insure their being kept in a neat and proper condition; and he shall be held responsible for any want of cleanliness about the premises.

## 2. WHAT OUR SCHOOL-HOUSES SHOULD BE.

A "Teacher" in the *Chatham Planet* writes as follows:—

"There are four general points about a school-house which demand special attention, viz., accommodation, heat, light and ventilation. * * * In its strictest sense, these things belong to the *plan*, and as they are the most important, let them have our first attention; but let us not forget or neglect to associate with them a good design, for thereby we increase the value of the whole work, and form a combination of utility and beauty, which will have a powerful influence over the minds of all who are brought in contact with it."

Accommodation.—The size of a school-house depends mainly on the number of pupils it is to accommodate, but trustees must remember that they must have a second room if there are more than fifty pupils attending the school; and further, there must be at least nine square feet of floor surface for each pupil, and the walls must be ten feet between the floor and the ceiling. This is a step in the right direction, but the limit of minimum size should have been greater. Why? Are not our school-houses large enough now? Most decidedly they are not. Why is it so many pupils who regularly attend our Public Schools are pale and feeble, troubled with nausea, sick-headache, &c.? On an average each pupil vitiates at least eight cubic feet of air per minute, *i. e.*, makes it unfit for re-inspiration, on account of the carbonic acid gas, a deadly poison, thrown off from the lungs, which it contains. There are but few school-houses in the Province which contain more than sixty cubic feet of space for each pupil, and very many do not contain that much. In six or seven minutes nearly all that air is perfectly unfit for inhalation, but thanks to the cracks in the walls and floor, it is partly renewed, and the little sufferers are spared a little longer. There must be sufficient ventilation to carry off this impure air, a sufficient supply of fresh air must be introduced, and there must be sufficient space in the room to accommodate the air introduced, that it be not changed too suddenly, and the pupils thus subjected to equal danger from cold. The introduced air cannot be heated and diffused through the room by any ordinary heating apparatus in ten minutes, and in that time each pupil has vitiated eighty cubic feet of air; hence the minimum space required by the regulations of the Council of Public Instruction is too little. A room designed for fifty pupils should not contain less than seven hundred square feet, and be at least twelve feet between the floor and ceiling. This will leave sufficient space for aisles, cases for books and apparatus, platform for recitation, &c. The school-room should never be used for other objects than study and recitation; hence there should be accommodation provided for the pupils who, through distance, inclemency of weather, or other cause, have to remain near the school-room during the noon recess, and for those pupils who may arrive before the time of opening school.

Heating.—The common mode of heating school-houses is very objectionable. There is generally but one stove in the room, which must be kept nearly red-hot, that the farther parts of the room may be occasionally allowed a breath of warm air; hence those near the stove suffer from heat and carbonic acid gas, for the red-hot iron is permeable by it, while those at a distance suffer from cold. In the locality of the stove there is generally a quantity of fuel, dust and dirt, and idly-disposed pupils who, through excuse of being cold, collect there to perform their mischievous tricks. The noise necessarily arising from this, and keeping up fires, together with smoke and other concomitant evils, are great annoyances, and greatly retard the progress of the school. To avoid all this inconvenience, there should be a basement to every school-house, in which wood could be stored, and a furnace or heater, which would cost but little more than a large stove, erected; or a stove may be used, provided it is encased in zinc or tin, so as to force all the heated air into the room, instead of distributing it about the basement. Heated air thrown into a room at any point will distribute itself equally through every part; hence, if every part of the room is reasonably light, and double windows used, the room will soon be comfortable.

If circumstances will not permit of a basement, and a stove *must* be used, it should have a tin or zinc casing surrounding, and six inches from it, extending to the floor, the top perforated with small holes to let the hot air escape into the room, and the front closed in round the door so as not to obstruct putting in fuel. That there may be a constant supply of fresh air, a trunk or pipe should pass outside underneath the floor, and communicate directly with the stove. The room is thus constantly filled with fresh, warm air, while the impure air is carried off by the ventilator. When the room is large, two stoves should be used, one at each end of the room, in order to avoid heating them too much, because when heated red hot, iron is permeable by several obnoxious gases.

Ventilators.—All windows should be hung on pulleys. If the windows and doors are skilfully managed, a tolerably good degree of ventilation is obtained, but in such cases the windows should extend as near the ceiling as possible, which detracts from the beauty of a building.

A better plan is to have a ventiduct of about twenty-four inches by eighteen inches, passing from the ceiling through the roof, and supplied with a properly filling valve, with a cord attached, which can be opened or closed either wholly or partly, as circumstnnces may require. The ventiduct and flue might be built together, the former being in front, and separated from the latter by a sheet iron partition. The heat from the smoke in the flue rarifies the air in the ventiduct, causing a brisker current to pass out, while the emission of smoke is not retarded. It might be well to have the ventiduct extend to the floor, and have two registers, one at the ceiling, the other at the floor, because gases condense suddenly when brought in contact with a flat surface, hence some of those obnoxious gases abundant in the school rooms, will cool suddenly at the walls, and being rather more than one-half heavier than pure air, will fall to the floor, and there remain, unless some provision is made for their escape.

Lighting.—Light is necessary to health. Common observation shows that persons who live in well lighted houses suffer less from disease than those who, from various causes, have the light entirely or partially excluded from them. It is an unquestioned fact, that houses surrounded by dense shrubbery, or a room into which the sun never enters, is never healthful, Plenty of light, too, renders a room cheerful and inviting. School houses should be made so, therefore, they should be well lighted.

The best way by which a school room can be lighted is by a skylight, because the light is steady, equally distributed about the room, and free from shadow. If this mode is not always practicable, resort must be had to the next best method, which is by side windows. Windows should not be placed in the end of a school room, because the light from behind casts a shadow, while that from in front causes a glare. Light should be admitted on the left side only, because, when admitted from both sides, there is too much cross light, which is injurious to the eyes, and when admitted from the right, the pupil is working in his own light. All windows of a school room should have shutters on, those on the right side may be kept shut, and not injuriously affect the appearance of the building, while the desired effect is produced on the inside. Windows should be many, narrow and high, rather than few and wide, not less than four feet from the floor, provided with curtains, and the glass in the lower half either frosted or stained.

* *Temperature.*—In winter the temperature during the first school hour in the forenoon or afternoon, should not exceed 70°, nor 66° during the rest of the day.

# V. Papers on Practical Education.

## 1. A POINT IN GRAMMAR.

*To the Editor of the Journal of Education:—*

Mr. Editor,—There is one question in Grammar which has elicited a great deal of discussion, and which does not yet appear to have been very satisfactorily answered, which, to my mind, may be very easily settled. Considerable space is taken up with its discussion in the appendix in Bullions' Grammar, but still it is not made very clear. The question I refer to is this: Is it (more) correct to say, "the first two," or, "the two first"?—"the last three" or, "the three last," etc.? In Bullions' Grammer the preference is given to the latter form of expression; however, if I were allowed