

children, as the noise and the training of the infants disturb and injuriously affect the discipline and instruction of the older children.

13. The windows should be of glass set in wood or iron casements. Lead lights and diamond panes are not allowed.

14. The sills of the windows should be placed not less than 4 feet above the floor.

15. A large portion of each window should be made to open.

16. The doors and passages from the school-room to the privies must be separate for the two sexes. So must also be the privies themselves. If they cannot be constructed entirely apart from each other, there should be between them a dust-bin, or other sufficient obstacle to sound as well as sight.

[Water closets can now be provided at a very reduced cost, and they may be introduced with advantage wherever there is a sufficient supply of water to cleanse them thoroughly. Great attention must be paid to the drainage of them. Earthen pipes measuring 4 or 6 inches in diameter, cemented at the joints, glazed and trapped are the best for this purpose.

Earth-closets are also frequently used with success.]

17. The privies must be subdivided, having a door and light to each subdivision.

18. The children must not have to pass in front of the residence on their way to their offices.

19. The Residence for the Master or Mistress should contain a parlour, a kitchen, a scullery and three bed-rooms; and the smallest dimensions which their Lordships can approve are—

SUPERFICIAL AREA.

- (a) For the parlour 12 ft. by 12 ft.
- (b) " " kitchen 12 ft. by 10 ft.
- (c) " " One of the bed-rooms 12 ft. by 10 ft.
- (d) " " Two other bed-rooms 9 ft. by 8 ft.
- (e) 8 ft. in height to wall-plate.
- (f) 8 ft. if ceiled at wall-plate, or 7 ft. to wall-plate, and 9 ft. to ceiling.

20. The residence must be planned so that the staircase should be immediately accessible from an entrance-lobby, and from the parlour, kitchen, and each bed-room, without making a passage of any room.

21. Each bed-room must be on the upper story, and must have a fireplace.

22. The parlour must not open directly into the kitchen or scullery.

22. There must be no internal communication between the residence and the school.

24. There must be a separate and distinct yard, with offices for the residence.

25. The porch must be external to the school-room.

26. Iron or wooden buildings cannot be approved.

27. An infants' school must have a play-ground attached to it.

28. In the case of a mixed school there must be separate play-grounds for the boys and girls.

29. The play-ground should be properly levelled, drained, and enclosed.

III. Papers on Seating, Ventilation, etc.

1. MISTAKE IN SEATING CHILDREN IN A SCHOOL-ROOM.

A great mistake has been made in some school-houses by seating them in such a way as to have all the pupils in the room face the windows. Such an arrangement cannot be otherwise than injurious to the eyes of the pupils, as the strong light is constantly shining into them. Pupils should always be seated with their backs or sides to the windows. There should be no windows in front of them.

2. SIMPLEST PLAN OF VENTILATING SCHOOL-ROOMS.

The simplest plan for ventilating school-rooms where stoves are used is to commence to build the chimney on the floor, building a small fireplace and hearth. Let the fireplace be so built as to receive a register instead of an ordinary screen. This should be so set as to be easily removed when necessary. Place the stove in one corner of the room; it should be furnished with a hollow drum; into this a tin tube of the size of the opening in the drum should be inserted, coming from the outside of the house. This tube should have a damper, by means of which the air from without can be shut off when desired. Let the stove-pipes pass from the stoves to the centre of the room, and then to the chimney in the back part of the room.

3. NECESSITY FOR TEACHING THE ELEMENTS OF NATURAL SCIENCE.—WARMTH AND VENTILATION.

Everybody must sincerely hope that the increased attention given to natural science in the schools and colleges of the present day will tend to the removal of ignorance on some subjects of every day importance as to which, it cannot be concealed, a great deal of misconception has hitherto existed. It is perfectly astonishing how much discomfort and worse than discomfort is often put up with, simply because the rudiments of natural philosophy or some of the most elementary principles of hygiene are unknown or misunderstood. And without some grounding in the elements of physical science, people are apt to be harmed rather than benefited by the hints they get from health magazines and the like. The indifference which results from ignorance is in some cases much preferable to an attempt to follow advice ill comprehended. A curious example of this we notice in recent English papers. Mr. Rawlinson, a gentleman of much experience in architectural matters, some time ago, addressed a letter to the *Times*, in which he recommended the admission of fresh air into houses directly from the outside, alleging that manufactured air can never be fresh air, and that therefore all stoves, hot water apparatus, or other modes of warming houses by close stove flues and pipes, manufacturing and pouring in artificially warmed air, cause offensive sensations, and to delicate constitutions prove unwholesome. "Air," he added, "is never so fresh as when it comes into a house or room direct; there is some deleterious property in flues which takes the life out of the air passed through." This was taken to mean a recommendation of open windows in all weathers, with a use of shawls and topcoats indoors for those who feel cold. A few days after his letter appeared, Mr. Rawlinson calling upon a lady found her sitting with a French window wide open, "looking anything but comfortable," and she welcomed him with a faint smile, saying, "See, Mr. Rawlinson, I am following your advice." Another lady wrote from the north of Scotland to a friend that she was "suffering from sitting with open windows, *à la* Rawlinson." A third wrote from Liverpool, "Must I understand from your letter that you have ceased to warm your once comfortable house, and sit in your top coat with the window open? If so, I do not agree with you."

Finding that he had been misunderstood, Mr. Rawlinson, in a later communication, endeavours to be more explicit, and, to illustrate his meaning, describes his own house and the appliances which exist for warmth and ventilation. His dining-room and drawing-room each contain about 5,500 cubic feet of space, and the doors are nine feet high, by four feet wide. The bedroom and dressing room contain about 6,700 cubic feet. These rooms are warmed by ordinary open fire-places. The basement, entrance hall, and staircase are warmed by hot water apparatus. The dining and drawing room doors are unusually large, for the purpose of facilitating room ventilation, the swing of so large a door moving a surface area of 36 square feet and the cube of the entire room. Then, there are means of ventilation in the basement at eight points beneath the floors, the inlet in each case being through charcoal strainers. The subsoil is covered with concrete, the sleeper blocks are vitreous earthenware, the sleeper joists are sound old ship timbers, and there is a vitreous damp-proof course above the footings in all the walls. The windows, when the weather admits of it, are opened at top and bottom. "A fire in my bed room," Mr. Rawlinson adds, "is very seldom lighted, as I find by experience that a low night temperature in a bedroom better fits me to endure a low external temperature through the day. I clothe warmly, avoid draughts, and strive to keep my sitting-room at or about 65 degrees Fahrenheit; and if, during frost, I feel roasted on one side and frozen on the other side, I sit in a top coat, but not with an open window."

These remarks apply of course to the more expensive class of houses, for strange to say, ventilation is a matter which has received very little attention in many English residences of the most costly construction. Everybody remembers the outcry occasioned at the time of the Prince of Wales' illness, the fever being traced to the foul drains and ill ventilation of the noble mansion at which he had been making a visit. Mr. Rawlinson gives a number of instances of similar neglect. In one case the occupants of a beautifully situated country mansion, after much sickness and death among their number, left the house in despair. Their successors shared the same fate, and it was not till the costly edifice, with upwards of 600 acres of land, had been sold "a great bargain," that the purchaser on examination found the entire basement one vast cess-pit of corrupt and corrupting matter, tainting air and water alike. The cesspits and cesspools were emptied and filled in with quick lime, the large sewers and foul drains, with the foul subsoil, were removed, and the entire area covered with quick lime concrete. The cost was £1,100, and a new and pure water supply was obtained at a cost of £1,500, the unhealthiness of the house being thereby