## THE VENTILATION OF SMALL HOUSES.

We condense the following from a paper read by Dr. J. Baker Edwards, at the rooms of the Natural History Society in this city.

At the last meeting I dwelt with much emphasis on the fact that the exhalations from the skin and from the lungs of human beings are not justly estimated by the mere chemical products of combustion (*i. e.*, by the amount of oxygen consumed and by the amount of carbonic acid and steam produced.) Such an estimate is only one element in the general calculation.

Any one who has attended a crowded police court for a few hours must realize the fact that the air becomes laden with "dirty smells" arising from organic matters given off from the bodies and clothing of the multitude, and which may more properly be regarded as *vapours* than as gases. These condense continually in woollen clothing, drapery, and bed-clothing, and the first mode of ventilation to which I would call attention, and which is worth the notice of every householder, is the great value of periodically turning out every article of clothing and of drapery to get a thorough ventilation in the fresh air.

The practice, which is only occasionally observed, of putting blankets, coats, &c., out of the window, especially in the sun's rays, is of inestimable value, and ought to be universal. The relief thus afforded to invalids confined to one room I have myself experienced, and been grateful for; and the value of such disinfection, as well as the process of heating to 212° the garments of patients recovering from infectious disorders, should not be lost sight of.

A second mode of indirect ventilation is by the frequent lime-washing of the basement premises of small houses. Lime and carbolic acid have each great purifying powers, and when combined and used every month or so, will purify most effectually air which is otherwise musty, fusty and unwholesome. The cellars of the smaller class of houses are frequently damp and unhealthy. A plentiful use of the lime-wash is the best remedy for this. It is bad economy to devote the basement of a small house to the rats; it should be clean and habitable.

3rdly. The use of carbolic soap in scrubbing floors is highly to be recommended. Moreover, during the summer months, the house will be much sweeter and cleaner if curtains and carpets are rolled up and put away. In this climate they are worse than useless in summer, and are only harbourers of dust and insects.

4thly. The stovepipe holes are the proper apertures for ventilation during summer. It is an absurd practice to stop them up. They may be made available for the very best means of ventilation, and the mode I now exhibit, and for which I have made application for a patent, is, I think, a cheap and perfect ventilation, but if this is too dear at a dollar you may nail a piece of perforated zinc over your stove-pipe hole and obtain a great deal of comfort therefrom during the summer.

Furthermore, if you have good clean lime-washed basements and kitchens, you can keep your house much cooler and less oppressive if you keep your double windows on during the summer, and only open them at night. The coating of air between the windows arrests the heat rays of the sun, and keeps the house cool. For winter the chief object in a small house is to equalize the temperature so that there shall be no chill in passing from one room to another, or from a room to the stair-case. The hall stove usually accomplishes this; it is desirable that water should always be kept evaporating upon it to moisten the heated air. Comfort will be best secured by pasting paper round every double window and nailing list round every door to fill up all chinks and crannies, let all the fresh air come up from the basement, and ventilate by the chimnies or by the attic. In rooms which are apt to be over-heated at night from the use of gas, or stove heat, the best contrivance is a ventilator such as I have described, placed in a T pipe in place of the elbow of the stove. This may be regulated if the stove be burning, by a damper. A similar use of the ventilator in a kitchen stove would carry off all the smell of cooking which now generally ascends the staircase of small houses, and is not always agreeable.

Simple attention to these hints will afford tenants the comfort of a good ventilation at a very small expense, and if these or similar precautions be neglected by them, I fear landlords will in vain seek for any perfect system of automatic ventilation. To obtain a good draught from the chimney top without back smoke, I recommend the form of chimney now exhibited, which should be made in galvanized iron, and which will under almost all circumstances insure an ascending current of air sufficient to ventilate several apartments. It consists of three T pipes put together, and is both cheap and efficient. Lastly, I call your attention to a simple form of ventilation for hanging windows, consisting of an oval tube of perforated zinc, containing a hanging curtain for the exclusion of dust, which is so great a nuisance and a foe to ventilation during some months in the year in this city.

One of the forms in which this useful contrivance is now offered to the public is represented in the accompanying illustration.

Its object is ECONOMY, EFFICIENCY, and READINESS OF APPLICATION. It is adapted to things *as they are*; and furnishes a cheap and ready improvement thereon, which may be at once adopted with advantage in every household which is provided with "a stove-pipe hole," and where is the house in Canada without one?

The simple principle of the hanging curtain, placed between two perforated surfaces, ensures a current of air, inwards to the chimney, whenever the atmosphere in an apartment becomes heated and before it becomes oppressive. Cold air falling as a down draught in the chimney is on the other hand distributed in fine streams by the perforated back, and closes the curtain. Soot and smoke are thus prevented from entering the chamber, and the ventilator can only act, and will act constantly, as a vent for overheated air and the products of its combustion. By its constant action an oppressive condition of the air is effectually prevented.

The principle is adapted to much larger application, but the above is the every day—and every house—convenience which will meet the requirements and the pockets of the multitude of Canadian householders.

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NEW MAGNETO-ELECTRIC MACHINE.—We have had an opportunity of witnessing the trial of a magneto-electric machine, which appears to be likely to give satisfactory results. The machine in question was made in France, but Messrs. Whieldon and Clarke, of Westminster Bridge-road, at whose works it now stands, are engaged in building a larger machine on the same principle. It will be remembered that in Wilde's machine the large electro-magnets were excited by an induced current derived from a row of small steel magnets, between which worked a Siemens armature. The present machine dispenses with the permanent magnets, the induced currents being made to circulate round the soft iron magnets which produced them. To Siemens and Wheatstone is due the proposal that such a machine should be constructed. Iron has usually some traces of permanent magnetism, especially if it has once been magnetised, and this magnetism is sufficient to induce feeble currents in a revolving armature. These currents are sent round the iron magnet, thus increasing its magnetism. Ladd also constructed a machine which embodied the principle. By the rotation of one Siemens armature, he obtained an induced current from a soft iron magnet, which he in turn further excited by the induced current. A second Siemens armature then collected the induced current from the other end of the magnet for use. The machine—at the trial of which we were present—consists of a row of modified horseshoe electro-magnets, surmounted by another row of inverted similar electro-magnets, the poles consequently being face to face, but of course separated by a space. In the central space there revolves a drum carrying the armatures, one armature being supplied to every pair of magnets. The armatures are simply rings or hoops of soft iron, surrounded by a number of helices containing wire. The ends of the wires of each helix are brought down to the shaft of the drum, each insulated from the other, and thence the currents are collected in the usual way. Pieces of iron attached to the poles of the magnets partly embrace without touching the armatures. In the machine in question there were three armatures, one of which was sufficient to excite all the magnets by means of the induced currents, as above described, and the other two were sufficient to provide a powerful current, which gave an excellent light in one of Mr. Ladd's lamps. The power required to drive the machine was about 3½ or 4 horse.—*Engineer.*