

Mechanics and General Science.

MR. SHERIFF RUTTAN'S LECTURES ON VENTILATION.

We have perused with much pleasure this useful publication, on a most important subject. No one can reflect on the necessity of a constant supply of pure air, to the health and comfort of man, without perceiving the general want of an adequate provision for the accomplishment of that purpose, in our dwelling-houses and public institutions. How frequently are large numbers of children huddled together in low-pitched school-rooms, without any other means of ventilation than what can be effected (and that is oftentimes very small) by opening the door or windows, a method at some seasons of the year dangerous or impracticable. The whole question is one fraught with interest to every human being, and we look upon those who urge its claims, and endeavour to promote its practicability, so as to meet the actual wants of society, as among the real benefactors of their kind.

Mr. Ruttan has invented and patented an apparatus for the double purpose of warming and ventilating, and, we are informed, with success. There can be no doubt that the common way of warming dwelling-houses in this country is both wasteful as regards fuel, and injurious to health. While Mr. Ruttan's plan would appear to diminish materially the former, it would unquestionably be highly promotive of the latter. We cannot but regret that this useful little work, which consists of two Lectures that the author delivered before the members of the Mechanics' Institution at Cobourg, should have been printed merely for private distribution. So important a subject, treated with so much clearness and ability, ought, we think, to have been fully brought before the public; an object, we trust, the author will not lose sight of, when he has completed his original design. We extract the following paragraphs from the preface, which will show our author's views of the nature and importance of the task he has so ably performed; and we may hereafter furnish our readers with extracts from the work itself, that have a peculiar bearing on important matters of domestic economy:—

"THE subject of the following Lectures, although a matter of the utmost concern to the whole world, appears to have engaged little of the attention of mankind. One reason for this may be, that the importance of breathing a pure atmosphere has never been, until within the last few years, either properly understood or its necessity enforced. Another reason may be found in the diffidence with which every person, who might be really capable of rightly thinking upon the subject, would approach a matter so purely scientific, in the face of the great names which are connected with it either directly or indirectly, in various countries. But the principal reason, it appears to me, is that those scientific men, whose attention may have been attracted by, and who have been capable of investigating the subject, have, for the most part, been inhabitants of such climates as stand in less need of the ventilation of their dwellings. Necessity, it is commonly said, is the mother of invention, and it is therefore natural to sup-

pose that any improvement, especially in domestic economy, which more or less influences all, should emanate from those who are likely to be most affected by its operation.

"I have myself, for many years, been anxiously looking for, and expecting some discovery by which the enormous consumption of fuel, to which under our present system of heating our dwellings we are obliged to submit, might be prevented. But what was every body's business, in this as in all other matters, appears to have been 'nobody's business, and not even an attempt has until now been made.

"It was in the course of my experiments for the economising of fuel, which, for the last few years, has engaged my attention, that I happened to stumble upon the important fact that the principle involved in the saving of fuel was that by which alone a proper system of ventilation could be carried out! So that, after all, it appears in this as in all other instances where the true principles of philosophical enquiry have been pursued.—Nature proves herself the most scientific agent!"

FIREPROOF BUILDINGS.

The extraordinary number of fires which now happen, and their great destructiveness, in the towns and villages of this wooden country, render it not only important that owners of property should be careful to insure, but that, in all new erections, every practicable precaution should be taken to avoid exposure. In towns and cities especially, blocks of buildings should be as nearly fireproof as possible. The following article, from the March No. of the *London Mechanics' Magazine*, contains some hints which may be of use to our City readers:—

"An interesting paper on this subject by Mr. Braidwood, the Superintendent of the London Fire Establishment, was read last week at the Institution of Civil Engineers. The author analysed the evidence as to the capability exhibited by cast and wrought iron beams for sustaining weights where they were exposed to any extreme changes of temperature. He demonstrated, by a collection of specimens of metal from buildings that had been destroyed by fire, that occasionally the temperature in the conflagration of large buildings rose almost to the melting point of cast iron; and that even in a small fire, beams and columns of cast iron would be so affected by the heat and jets of water thrown upon them, that they would probably be destroyed, and sometimes cause a fearful loss of life; as in many of the so-called fire-proof warehouses of the city, a number of persons employed on the premises slept in the upper floors, and if the lower beams gave way, the whole would be dragged down suddenly—whereas timber beams resisted fire some time, and allowed time for the inmates to escape. Another point which the author considered had not been sufficiently insisted on was the derangement of the brickwork by the expansion of the iron beams at high temperatures, and its sudden contraction on the application of cold water; and also from the mortar becoming completely pulverized by the excessive heat, instances of which have been known to occur. The following were the principles on which Mr. Fairbairn had proposed to construct fire-proof buildings. The whole of the buildings to be composed of incombustible materials, such as iron, stone, or brick. 2. That every opening or crevice communicating with the external atmosphere be kept closed. 3. An isolated stone or iron staircase to be attached to every story, and