THE SMOKE NUISANCE.

In a recent number we stated that a select committee of the House of Commons was now sitting for the purpose of devising some plan by which, with the sanction of a legislative enactment, that which is called the smoke nuisance may be suppressed. A report of the proceedings before that committee appears in the last number of an excellent weekly contemporary, *The Mining Journal*, from which we have framed the following account.

Mr. Mackinnon, the chairman, opened the proceedings by stating the objects to which the attention of the committee should be directed, and the results which he hoped would follow the inquiry—viz. the enactment of some legislative provision by which the reluctant would be coerced into ridding the atmosphere of our commercial and manufacturing localities from the nuisance of an over-charged atmosphere, loaded with the unconsumed products of our great furnaces, and alike destructive of the health, cleanliness, and comfort of their population. The committee then examined two members of its own body, Mr. Beckett and Mr. Muntz. The former stated that in the borough of Leeds the manufacturers had shewn the greatest readiness to comply with the provisions of a local act, which compelled the adoption by them of the best mode discovered for the consumption of smoke: the plans of several patentees had been adopted with more or less success, and the result was a considerable improvement in the atmosphere, effected at a very trifling expense. The principal feature seemed to be the admission of atmospheric air to cause the ignition of the smoke or gases. Mr. Muntz also bore testimony to the inclination of manufacturers to abate the nuisance. He had made numerous experiments on all kinds of furnaces, and all the proposed plans, and it appeared to him that the safest and cheapest principle was to have an excess of boiler room, and never to have the fire forced in its work—that is, raked up, so as to keep the coal in a quick state of combustion. He had tried all the plans, and never found any that would diminish the quantity of smoke where a certain heat was wanted in a certain space. He had never seen an experiment but where the admission of air, without an increased quantity of boiler room, has not only not been a saving, but a loss.

Dr. URE was then called in, when the chairman said that the committee wished to divide the subject under three heads—1st, the feasibility of correcting the nuisance; 2nd, the policy of compelling parties to adopt measures for that purpose; and, 3rd, the expediency of legislative compulsory enactments. Dr. Ure, thereupon, stated the general principles on which combustion proceeds in a furnace.

"When coals are thrown on a grate a large quantity of gas is distilled off. These gases require a great deal of atmospheric oxygen to consume them, and their combustion has hitherto been very much overlooked in furnaces. Their consumption has been trusted, hitherto, very much to the introduction of air up through the bars of the grate; that air producing carbonic acid gas, from its combination with the carbon on the bars, is, nevertheless, quite incapable of burning the gases that occupy the space above the fuel, and in the upper part of the furnace. The attempt to burn those gases, by the air which passes up through the bars (and which he shewed was quite incompetent to the purpose), has been, the Doctor observes, 'the radical defect of almost all furnaces hitherto;' the consequence was, that this gaseous matter gets too little oxygen, and, instead of burning the carbon and hydrogen, which constitutes the gases, the carbon is deposited in a pulverised form, constituting smoke and soot, and a great deal of it gets half burnt, forming what is well known under the name of carbonic oxide, which is but half-burnt charcoal—charcoal burnt with but half its quantity of oxygen, constituting carbonic oxide. This goes off in an invisible form, and people then say the combustion is complete; in this way, however, only one-half of the heat is got out of the carbon of the coals, and this mixes with the deposited charcoal, or fine soot, and constitutes smoke. With respect to its effect on health, Dr. Ure observed, that it was a very important part of the subject, as this invisible gas, resulting from the semi-combustion of the carbon, is the most noxious of gases, and more so than the full-burnt charcoal, or carbonic acid. Carbonic acid, we know, when condensed in water, forms a very agreeable beverage—viz. soda-water. Carbonic acid is condensed by moisture; it leaves the atmosphere, and what remains forms the food of plants. Carbonic oxide, which proceeds from the half-burnt charcoal of the coal, and which passes from our chimneys in an invisible state, is the most noxious of gases in the atmosphere; two or three inhalations of it are capable completely of destroying life. This is dangerous, as it may be breathed, and may enter the lungs, but the full-burnt charcoal cannot be breathed. The moment it gets to the windpipe, the *epiglottis* shuts, but the carbonic oxide is a light gas, enters the lungs easily, and is most fatal. This gas, of which so little has been said, as the production of combustion, is much more injurious to the atmosphere, and the health of towns, than the gas from full-burnt charcoal. This carbonic oxide gas, which is so injurious, is produced by those bad contrivances which have been patented, and not patented, and which began with the celebrated James Watt, who thought that, if he could render the productions of combustion from furnaces invisible, he had accomplished the purpose of burning those products. His contrivance was the making the smoke pass over incandescent fuel—that is to say, red-hot cinders. He thought, by that means, if he effected the annihilation of the smoke, he had made a great discovery; but, the fact was, as the Doctor described it, that which had been completely burnt in the anterior part of the furnace, and rendered it carbonic acid—meeting the red-hot cinders, dissolved or combined with an immense quantity of their carbon, and became carbonic oxide; that, indeed, is the way they make carbonic oxide. Carbonic acid, passing over red-hot fuel, takes up a second dose of charcoal, and thus, instead of consisting of two atoms of oxygen and one of charcoal (which is carbonic acid), it comes out one atom of oxygen and one of charcoal, which is carbonic oxide. This, the Doctor stated, he considered a very important view of the subject; as, since the patent of Mr. Watt, there had been an immense number of patents in the same line for consuming smoke, nine-tenths of which consist of this leading principle. Atmospherical air, admitted in a stratum over the coals, chilled their combustion, and precipitated the smoke. In order, then, to get quit of this smoke, he kept the remote end of the furnace covered with red-hot cinders, or coked coal. Thus, the carbonic acid and smoke, getting into contact with those red-hot cinders, became carbonic oxide, and went off invisibly, no doubt, but then it polluted the atmosphere, and the fuel was only half burnt. The error of Watt, then, was admitting too much air in the wrong place, and in too thick a body.

"The following portion of the examination of Dr. Ure is highly instructive and interesting:—Q. One of the erroneous impressions you wish to remove is, that of the noxious quality of the smoke being cured by the annihilation of its blackness? A. Just so; you convert the smoke into carbonic oxide gas.—Q. And, therefore, persons suppose that, because they remove the colour, they get rid of the evil? A. Just so; but I would say that it is better to have a little dust, than to be breathing carbonic oxide.—Q. Is not the great object which you have in view to prevent smoke? A. Decidedly.—Q. Is it not the case, that the more perfect the combustion, the more complete the prevention of smoke? A. There is a perfect combustion which prevents smoke, and there is an imperfect combustion which also prevents smoke—I want the perfect combustion.—Q. With regard to the perfect combustion, would there not be, not only a prevention of smoke, but a saving of fuel? A. That is so.—Q. But, when the smoke is once produced, it may, in appearance, be consumed, but that would require an increase of fuel? A. That is the case.—Q. The gases would not be destroyed, but only covered? A. Just so.—Q. Then the committee are to understand, that what is called the burning of the smoke is a great error? A. It is a great error."

Dr. Ure then went on to explain the principles on which the admitted air should be introduced, so as to effect the required perfect admixture of the gas and the air, to insure perfect combustion. He recommended the plan of Mr. C. Wye Williams, and the introduction of air through numerous small apertures, so as to effect a more rapid mixture. The effect, as described by Dr. Ure, was, that the moment the orifices were opened, and the air admitted in this divided state, if there had been volumes of air the moment before, the smoke instantly vanished.

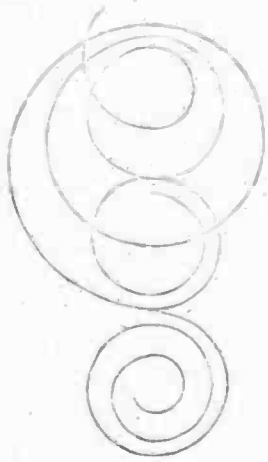
We shall give the evidence of Professor Brande and other scientific persons, as it shall be made known.

The sculptor Schaller, and the Belgian painters De Keyser, Gallait, and De Biefve, have been elected members of the Imperial Society of Arts in Vienna.—The Emperor of Russia has conferred on M. Horace Vernet the order of Ste. Anne of the second class with the star, enriched with diamonds.

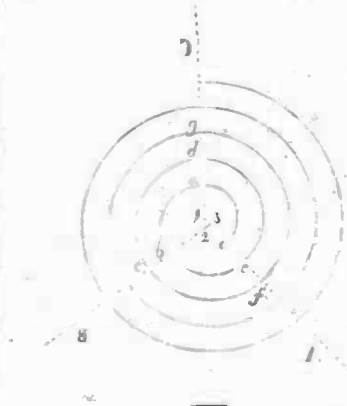
THE CURVES OF FANCY EQUATED.

TO THE EDITOR.

PROBLEM IV.—*To describe a compound spiral.*—The spiral in Fig. 4 is formed by problems I. and II., but the combinations of these two problems would form numerous curves according to the positions assumed as centres are made to vary: we shall therefore leave other combinations to the fancy of the student.



PROBLEM V.—*To describe a spiral from any number of equidistant centres.*—In this case we shall select three points, 1, 2, 3, produce them in the directions 1 A, 2 C, 3 B. With 1 as centre and any distance 1 *o*, describe the arc *o a*; with 2 as centre and 2 *a* as distance, describe the arc *a b*; with 3 as centre and distance 3 *b* describe the arc *b c*; again, with centre 1 and distance 1 *c*, describe the arc *c d*; and so on, may the spiral *o a b c d e f g*, &c., be continued.

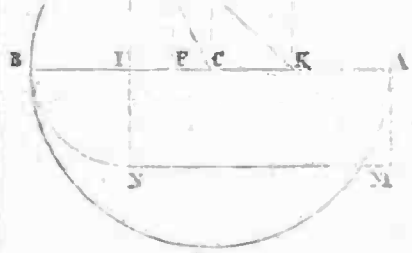


TO THE EDITOR.

SIR,—I beg to submit this solution of a question which appeared in No. 27.

I am, Mr. Editor, your obedient servant,

JOHN BARR.



Let the given line be A B, which is to be divided into two such parts that the rectangle shall be equal to the square of their difference.

With A C, equal to half A B, as radius, describe the circle A D B E; and draw D C equal to A C and perpendicular to A B.

Put F G, twice F C, parallel C D, and produce the line C G to meet the circumference at H. From the point H draw H I parallel to D C, and in H I produced take I N equal to I B.

Take C K equal to C I, join K and H, and complete the square H I K L. Draw the tangent