

Ventilating Parliament.

WRITTEN AND ILLUSTRATED BY FRANK FOULSHAM AND A. C. BANFIELD.



ACCORDING to the late Dr. Percy, who held the office of Superintendent of Ventilation at the Houses of Parliament from 1865 up to the time of his death in 1889, human sensations are not always infallible with respect to judging of atmospheric temperature, as the same external temperature does not always equally affect the same individual. The state of the stomach as to the quantity of food which it contains, the amount of alcoholic liquor circulating through the system, previous muscular exertion, and the stimulation of mental excitement all tend to modify our susceptibility to atmospheric temperatures. Different individuals experience different sensations according to their habits (particularly as to the use of cold ablutions), their clothing, and the climate of the country in which they have mostly resided.

It has actually occurred that two members sitting in the Debating Chamber of the House of Commons have simultaneously complained that the temperature was atrocious—one declaring that it was most uncomfortably low, the other asserting that it was intolerably high!

The task allotted to the Chief Engineer of the Houses of Parliament has been both complex and difficult; the difficulty has arisen largely from the site and construction of the present buildings and from the delicate conditions to be fulfilled. It has puzzled many brains to find a satisfactory solution to this problem. How can the most perfect hygienic arrangements be embodied in a huge and intricately-planned building designed more in consonance with sentimental and historical feelings than in compliance with hygienic arrangements?

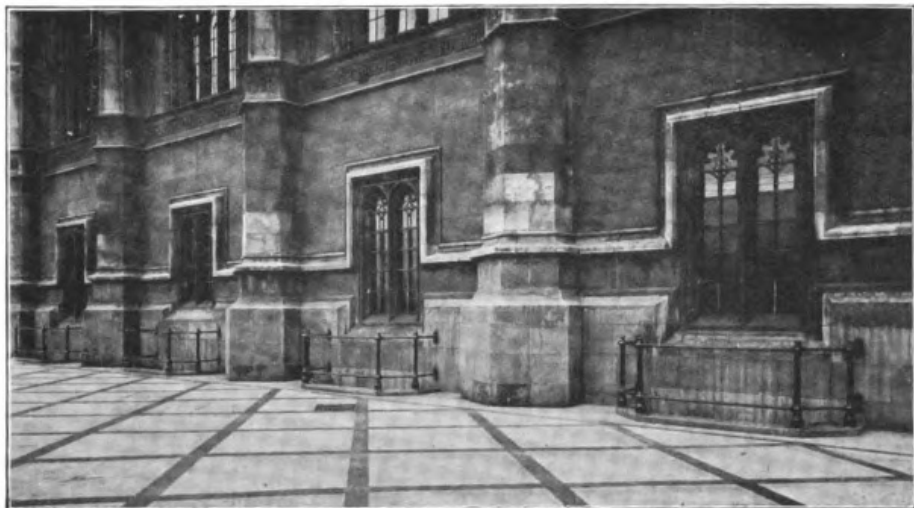
During the past fifty or sixty years the subject has met with much attention, and committees have been appointed for the pur-

pose of improving the ventilation of the building generally. Sometimes the committees distinguished themselves by totally reversing the opinions of their immediate predecessors; but by the help of competent men some few years ago a system was adopted which appears to give general satisfaction.

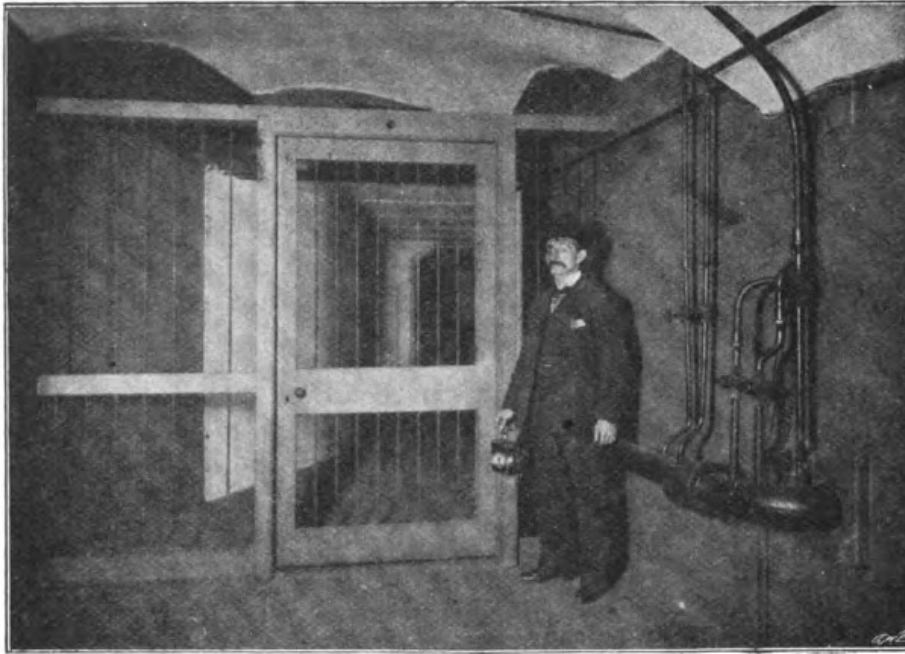
After an inspection of the present system of ventilating the Houses of Parliament the visitor cannot fail to regard the members as very spoiled darlings indeed, so elaborate are the devices and such enormous space sacrificed for the purpose of keeping the brains of our legislators at a normal temperature.

At one time the Clock and Victoria Towers were used as down-cast shafts for the admission of fresh air to the building, but as it was sometimes a puzzle to find the needful freshness amidst the smoke and other constituents of an elevation of from 250ft. to 300ft. above the level of London streets, the plan was finally abandoned.

One would think that a much healthier atmosphere could be captured higher up than the famous Terrace, which is almost on a level with the Thames, but notwithstanding the risk of occasional contamination due to passing barges containing refuse, the smoke issuing from the funnels of steamboats, and the plentiful supply of old-fashioned mud laid bare at low water, it was decided that the Terrace was the more favourable for the purpose, owing to the width of the river and the practical immunity from road-dust; whilst it was also argued by a distinguished scientist that the action of the tide was of



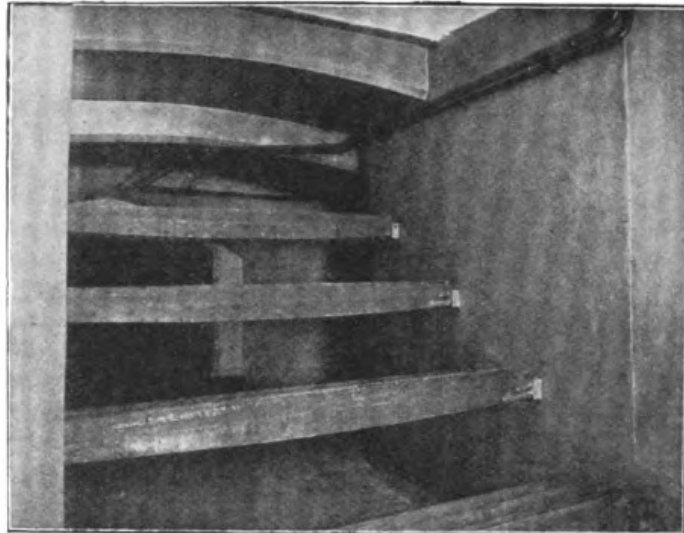
NO. 1—THE FRESH AIR INTAKES ON THE TERRACE.



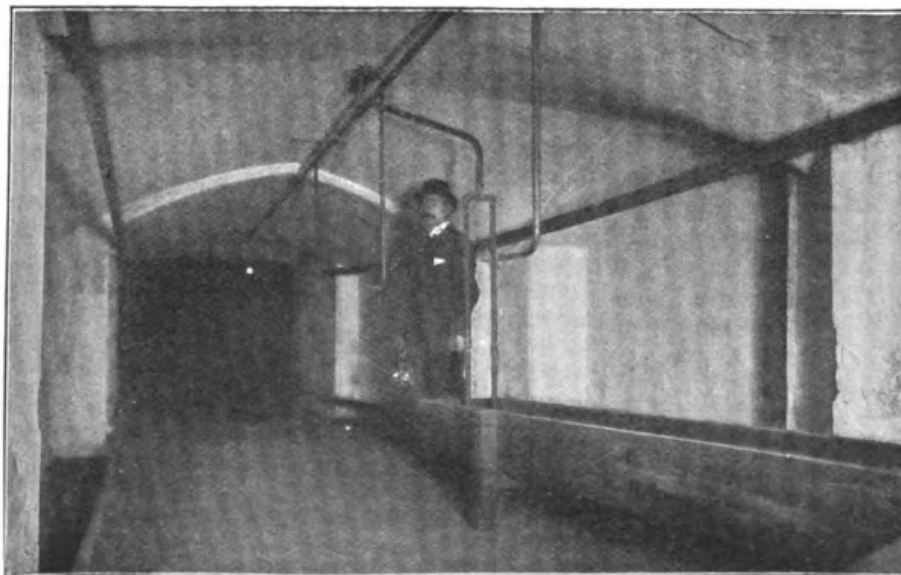
NO. 2.—ALL AIR USED PASSES THROUGH THIS GATEWAY.

advantage in producing a change or supply of air.

The House of Commons obtains its necessary ventilation, in the first place, from several intakes on the Terrace. Three of these, as shown in photograph No. 1, are exclusively appropriated to the ventilation of the Debating Chamber and lobbies. The air is drawn through the barred openings to three separate chambers in the basement of the building. In each of these chambers are fitted spray jets, forming, when in action, a sort of water-curtain through



NO. 4.—ICE-RACKS OVER WHICH THE AIR IS DRAWN IN HOT WEATHER.

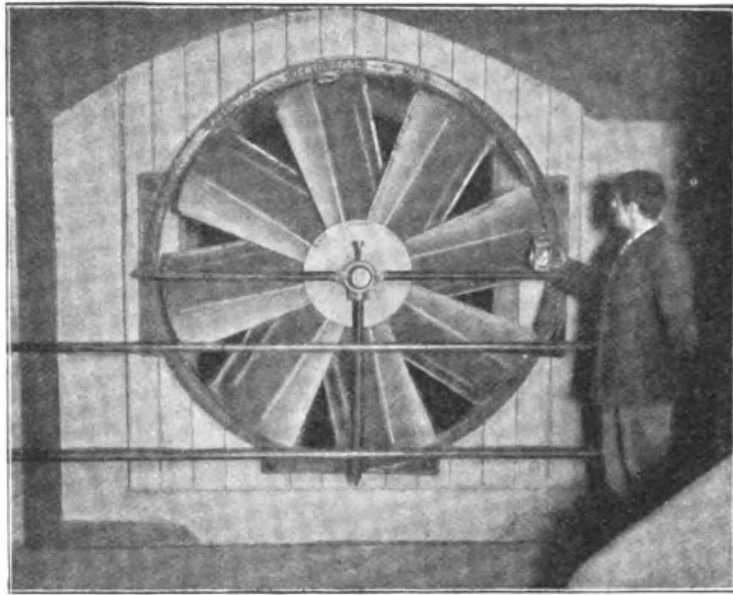


NO. 3.—TROUPS AND WATER-SPRAYS FOR PURIFYING THE AIR.

ers. Here there is also an apparatus for humidifying the air when the temperature calls for such treatment. At the end of the passage are huge shelves or racks upon which blocks of ice are placed (No. 4), so that there is not much chance of the air retaining its summer warmth after reaching this point,

Passing through a side passage, usually kept closed, the visitor comes in view of a 72in. diameter fan (No. 5), which is only used in foggy weather, for the purpose of forcing the air at greater velocity along the passages from the Terrace towards the intakes on the Terrace towards an ingeniously constructed fog-filter to be described later.

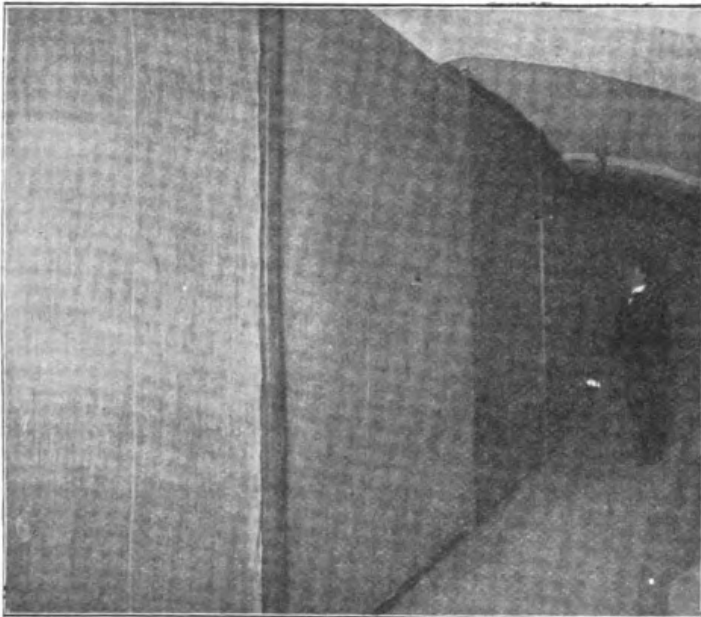
When the atmosphere is free from fog a considerable inward draught is created by a huge coke fire always kept burning at the base of the Clock Tower, through which the contaminated air finally makes its exit.



NO. 5.—THE GIGANTIC FAN FOR FORCING THE AIR THROUGH THE FILTER.

that only pure air shall reach the Chamber above. The fan already referred to is put in motion. This has the effect of forcing the air farther beyond the canvas screen into a most ingeniously constructed fog-filtering apparatus.

This is a V-shaped chamber, the sides being fitted with double frames of strong wire netting, between which are placed two layers of the finest cotton-wool. The doors of this chamber (No. 7), of which there are three, all dust-tight, are closed. The intruding air from the canvas screen has, in its progress through the



NO. 6.—CANVAS SCREENS THROUGH WHICH THE AIR IS FILTERED.

After passing through the ice-rack the incoming air passes along until it is discharged against a screen of canvas having the area of 600 superficial feet (No. 6). This effectually arrests any particles of dust or smuts that may have escaped through the water-sprays, whilst it permits a free passage of purified air through the corridor beyond.

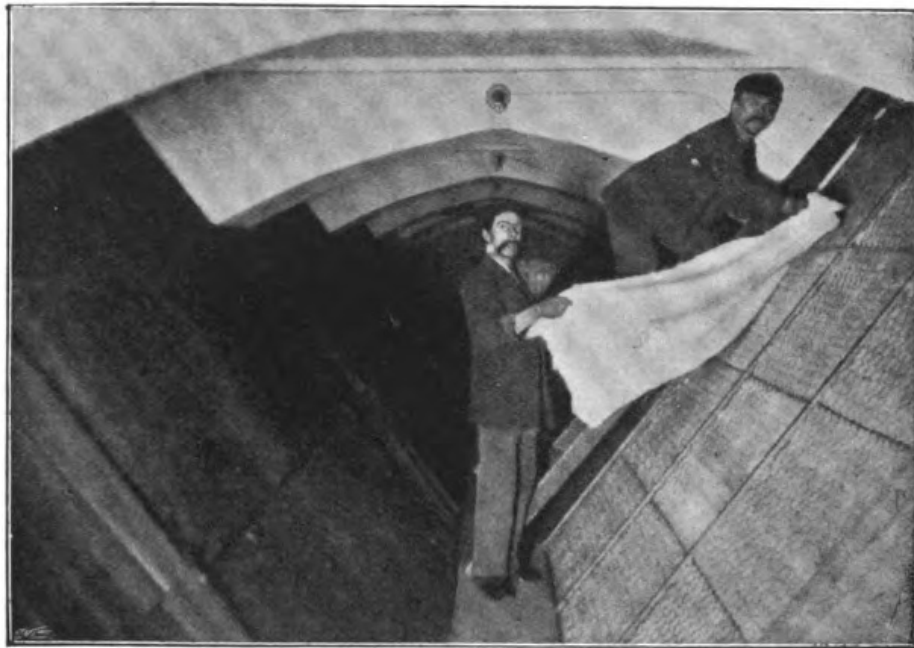
In foggy weather still more elaborate precautions are taken to insure



NO. 7.—ENTRANCE TO THE FOG-FILTER

latter, left most of its "blacks," smuts, or dust behind, but its foggy character is not yet destroyed. The filter does the trick. Forced against the sloping sides of the chamber, the air pierces a double thick-

through regulating openings to one overhead, wherein is placed the warming apparatus, consisting of rows of steam-heated batteries, the invention of the late Sir Christopher Gurney. Each battery consists of a number



NO. 8.—INTERIOR OF THE FOG-FILTER—LAYING ON THE SHEETS OF COTTON-WOOL.

ness of cotton-wool (No. 8), leaving behind it all traces of impurities, as the outside layer of the material testifies after three days' use: it has turned from a pure and snowy white into a something strongly resembling a stoker's oil-rag! (No. 9). The fog-filtering surface exceeds 1,000 square feet in area. Should there be a continuance of foggy weather very frequent renewals of the wool are necessary, otherwise the filter becomes entirely clogged with sooty matter.

In fine weather the sloping fog-filtering screens are not used. The doors are open wide, allowing the air to enter from the passage leading from the canvas screen.

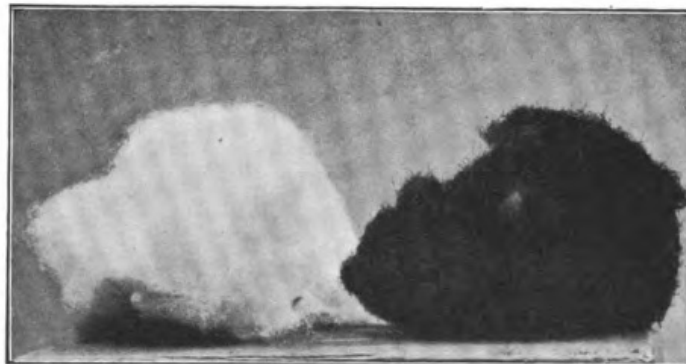
The air, as soon as it reaches the interior of the V-shaped chamber shown in the photograph (No. 8), is as pure as the ingenuity of man can make it in London.

From this chamber the air passes upwards

of rectangular plates of copper or zinc. The plates are fixed on a steam-pipe running through their centre, about two inches apart (No. 10.)

The thin layers of air between the plates are speedily warmed, and ascend to make room for other layers. Thus an upward current of gently warmed air is established. The flow of the heated current may be checked effectively by placing cloths over the

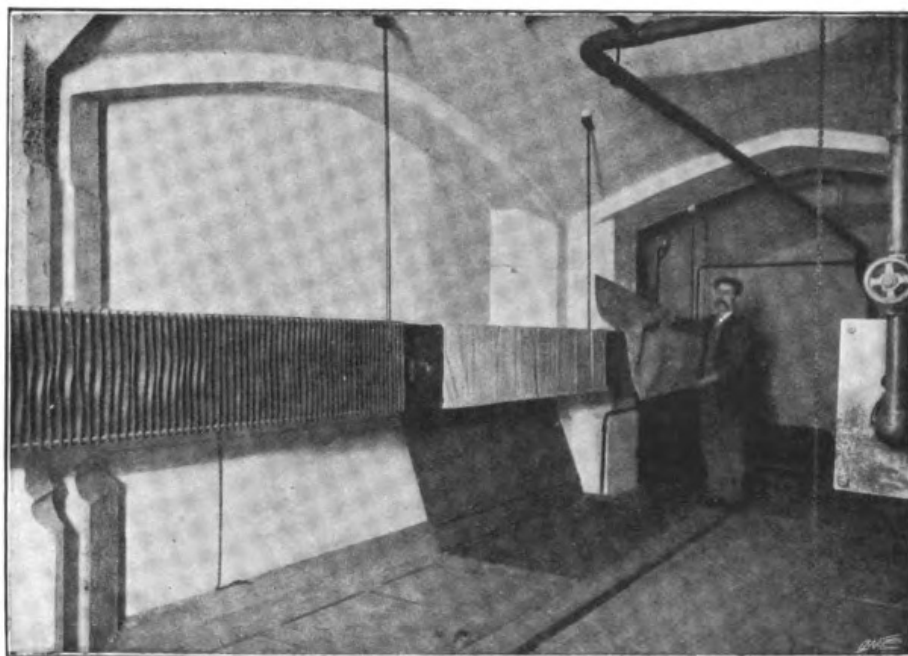
batteries. This prevents the warm air escaping from the batteries to make room for a fresh supply, whilst the change is less noticeable than would be the case were the steam turned off altogether, an event likely to prove unpleasant



NO. 9.—COTTON-WOOL BEFORE AND AFTER USE IN THE FOG-FILTER.

to the members of Parliament assembled above.

From the battery-room the air, whether heated, cooled, or filtered, rises into another, the ceiling of which is low and sloping at



NO. 10.—THE AIR-HEATING CHAMBER.

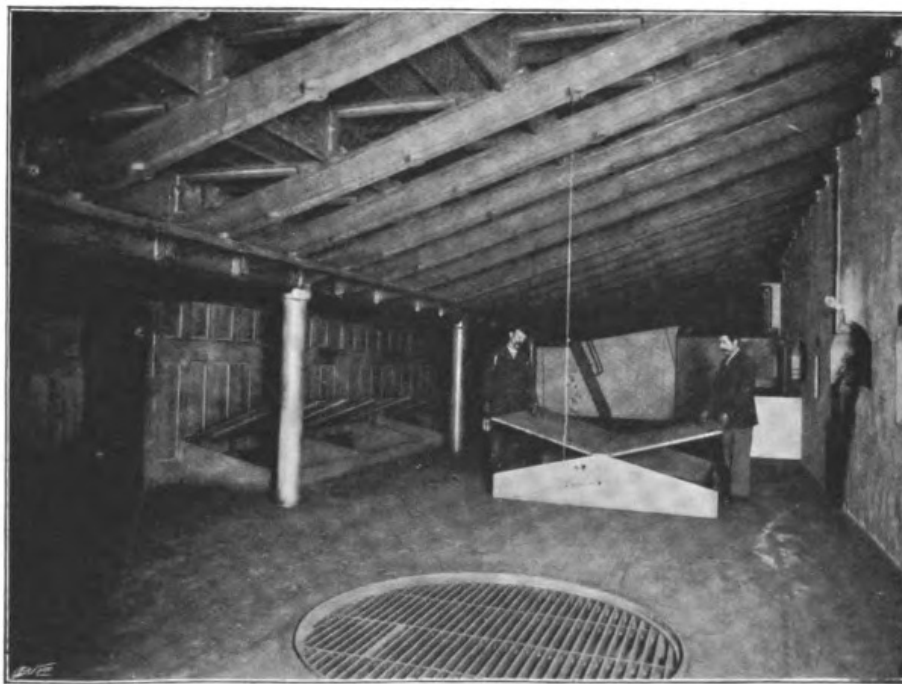
each side, corresponding exactly with the tiers of seats in the Debating Chamber of the Commons, immediately above.

Here, under the feet of the legislators, is the necessary apparatus to insure an equable temperature in the Chamber. Here are the controlling flaps and valves, in charge of experienced attendants during the sittings, who are ready at any moment to send upwards currents strong enough, if necessary, to almost blow the mats off the Chamber floor; to direct a warm current to one corner, which may need it, owing to a lack of members on that particular spot; or to admit a cooler draught to the crowded portions of the House (No. 11).

Over each opening a thermometer is suspended, to guide the attendant in his endeavours to please the 600 odd men whose idiosyncrasies on the subject of ventilation are many and varied.

The air passes into the all-important Chamber through its floor of

perforated iron plates, covered with a matting of net. In front of the benches are heavier mats, to protect the members' feet whilst they sit or stand up to address the House. Much of the flooring, however, is used for the ingress of air. Then there are side panels which are utilized for the same purpose, when desirable; and beneath the galleries are a number of flues, discharging fresh air from behind the fretwork of the cornice above the panelling, but at such an elevation as not to inconvenience members sitting near. Above



NO. 11.—EQUALIZING THE TEMPERATURE OF THE AIR.

the floor-line right around the Chamber are means of air-ingress, whilst the Visitors', Ladies', and Press Galleries are also carefully supplied.

And what becomes of the vitiated air? The lighting of the Chamber helps in no little way to send it merrily on its way skyward. For this reason gas is likely to be retained in the Chamber for some time to come. There are sixty-four great lights in the ceiling, to each of which is fitted a $3\frac{1}{2}$ in. diameter flue-tube. The draught created here is immense, and helps to rush the vitiated air to a huge flue, which is carried a considerable distance through the spent-air passage to the Clock Tower shaft, where a coke fire creates the necessary upward draught (No. 12).

The glass panels in the ceiling of the Debating Chamber are raised sufficiently to give a considerable area of space between their edges and the beams that give support to the ceiling. Through these openings a

great deal of the vitiated air escapes into a large space above, where there is a perfect network of ventilating tubes and shafts. This space is fitted with a great shutter, which can be hydraulically operated from the air-equalizing chamber beneath the floor of the House. When this shutter is opened the vitiated air rushes towards a wide-mouthed shaft, at the base of which a huge coke fire burns with a similar purpose to that already mentioned. In this way the bad air finds an outlet 200ft. above.

The Houses of Parliament throughout are ventilated with an equal amount of elaborate care. Over seventy hands are continuously employed in this department alone.

There is one thing that very forcibly strikes the visitor who may be privileged to see over this wonderful system of providing fresh air for the nation's legislative brains: His Majesty's Houses of Parliament must be the healthiest place in England wherein to spend a few hours daily!



NO. 12.—FIRE FOR HEATING THE AIR.
THIS FIRE HAS NOT BEEN OUT SINCE 1840.