

TABLE I. (Continued).—

Year.	Solar spotted area in millions of visible hemisphere.	Abnormal barometric pressure in thousandths of an inch.					
		Mauritius.	Bombay.	Madras.	Calcutta.	Batavia.	Zi-ka-wei.
1875	1		- 5	- 22	+ 2	- 11	0
	2		+ 1	- 11	- 10	- 7	- 18
	3		+ 2	- 4	- 3	- 1	- 16
	4		+ 1	- 1	- 9	- 5	- 12
1876	1		- 3	- 16	- 14	- 11	- 13
	2		- 1	- 18	- 19	- 10	- 8
	3		+ 9	- 13	- 3	+ 1	- 12
	4		+ 21	+ 12	+ 27	+ 22	+ 8
1877	1		+ 29	+ 30	+ 49	+ 28	+ 4
	2		+ 43	+ 46	+ 48	+ 46	+ 11
	3		+ 43	+ 55	+ 43	+ 47	+ 12
	4		+ 38		+ 32	+ 49	+ 29
1878	1		+ 24		+ 51	+ 34	+ 39
	2		+ 13		+ 55	+ 17	+ 34
	3		- 15		+ 33	- 1	+ 16
	4		- 33		0		- 4
1879	1		- 40		- 26		- 10
	2		- 15		- 2		- 7
	3		- 4		+ 4		- 3
	4		- 1		- 2		- 8
1880	1		- 8		- 14		

Comparison of Abnormal Barometric Movements at Different Stations.—The general resemblance of all these curves to each other is very remarkable; indeed if the Mauritius curve for the years 1867 and 1868 be excluded, there is scarcely a single prominent feature in any one of the curves which is not reproduced in the others. To show this the corresponding points of the different curves have been marked with the same small letters. It will be seen, however, that there is strong evidence of a want of exact simultaneity in the barometric movements at different stations, and that as a rule the changes take place at the more westerly stations *several months earlier* than at the more easterly ones. This is particularly noticeable in the curves for St. Helena and Madras from 1841 to 1846, when the latter sometimes lagged behind the former by as much as six months; in those for Mauritius and Calcutta from 1855 to 1866, when the latter persistently lagged several months behind the former; in those for Bombay and Calcutta from 1862 to 1866, when the difference in time often amounted to *upwards of six months*; in those for Bombay and Batavia from 1867 to 1878, when (as already remarked) the latter lagged behind the former at an average interval of about one month; and in those for Bombay and Zi-ka-wei from 1876 to 1878, when the latter lagged upwards of six months behind the former. *It appears then that these long atmospheric waves (if such they may be called) travel at a very slow and variable rate round the earth from west to east, like the cyclones of the extra tropical latitudes.*

Bombay

FRED. CHAMBERS

(To be continued.)

DR. SIEMENS'S NEW CURE FOR SMOKE

FROM among a number of letters which have been sent us on this subject we have selected the following for publication; to these Dr. Siemens has been good enough to append some important remarks.

IN NATURE, vol. xxiii. p. 25, I read with interest an article by Dr. Siemens describing an ingenious gas and coke fire which he suggests as a cure for the smoke nuisance. But although the darkening of the atmosphere or fog will certainly be prevented by its use, I am afraid the *gases from the coke*, especially the carbonic oxide, will make the fogs at least as poisonous and injurious to health as the open coal fires at present in use.

In these circumstances a description of an "Asbestos gas fire" free from this objection, which we have had in use in our smoking room for the last three years, and which, after a few alterations, has proved perfectly satisfactory, may perhaps interest your readers.

A $\frac{1}{4}$ -inch gas-pipe furnished with four Bunsen burners is laid on the hearthstone under the grate and parallel to the ribs, so arranged that the tops of the burners (which are made elliptical to pass through the bars) are flush with the upper surface of the grate, and two inches back from the line of the ribs. The fire-place is loosely filled with a preparation of asbestos in pieces about the size of a hen's egg.

This fire not only evolves a large amount of heat, but has a very cheerful appearance, similar to that of a bright coke fire, and to insure this it is essential that the burners should be placed close to the ribs, as stated above, and not in the centre of the grate. If this is not attended to the asbestos in the centre of the fire will be raised to a high temperature, but will not be sufficient to heat those portions in front, which will then not only be of no use as radiators in themselves, but act as screens to the light and heat generated in the centre. I suspect this was the cause of the failure of Dr. Siemens' pumice gas fire.

The cost of maintaining this fire is simply that of the amount of gas burned, as the asbestos is not consumed, and its prime cost is trifling. I have only further to add that there is not the slightest trace of fumes or smell from the fire two minutes after it is lighted.

D. A. STEVENSON

Edinburgh, November 15

DR. SIEMENS has described in your pages the form of coke-grate which he has fitted in his own house. As I had fitted a similar arrangement in this house before Dr. Siemens' letter appeared in the *Times* of November 3, and as it is simpler than Dr. Siemens' and succeeds even beyond my expectation, I send you a drawing and description of it. It varies, of course, according to the shape of the grate in which it is fitted; but for the sake of comparison I have copied Dr. Siemens' grate, and drawn my arrangement as fitted into it.

Instead of Dr. Siemens' arrangement for withdrawing the heat from the back of the fire and bringing it to the front, I merely line the whole grate—sides, back, and bottom—with fire-bricks. This obviates the necessity for the close-fitting ash-pan described by Dr. Siemens, which would be rather expensive to fit. I make the fire-brick in the bottom of the grate slope towards the front, and leave a space of one inch between the front of it and the perforated gaspipe down which space the ashes fall on to the hearth.

If my grate is not quite so economical in working as Dr. Siemens', it is very near it, and the first cost of fitting is considerably less. In fact, as most grates are lined with fire-brick at back and sides, nothing has to be done but fit a wedge-shaped fire-brick into the bottom, a half-inch iron gaspipe, perforated with holes in front, and connect it with the gas service, all of which can generally be done for a few shillings.

The saving of kindling-wood and of chimney-sweeping would pay for it in a year. In Dr. Siemens' grate the copper must cost about 1*l*. A grate fitted with this arrangement looks exactly the same as an ordinary grate, and there is nothing to prevent ordinary coal being burnt in it—in fact coal can be burnt in it with much less smoke than in an ordinary grate by turning on the gas for a few minutes when fresh coal is put on, when the dense black smoke emitted by the new coal is completely burnt up in the gas-flame. To people who object that a gas grate must produce a bad smell in the room I can only say, "Come and see." They will find that we have three grates with this arrangement in constant use in these chambers, and that they produce no smell and make a very pleasant fire. Any person who takes an interest in the subject is quite welcome to come in and look at them at any time.

COSMO INNES

Adelphi Chambers, 7, John Street, Adelphi

HAVING been experimenting for some years in the direction referred to by Dr. Siemens in NATURE, vol. xxiii. p. 25, I must beg to differ with him most seriously in some of his conclusions. The gas-fire with coke which he describes has, so far as our experience goes, several practical objections which prevent its use in the place of an ordinary gas fire, whilst when compared with a good coal fire it fails seriously.

First, with regard to the objections to Dr. Siemens' fire. It requires about half an hour to become anything like warm, as against ten to fifteen minutes with a well-lighted coal fire. Second, it makes as much or more dust and dirt than a good coal fire. Third, the grate requires as much cleaning and care as with coal.

I am not surprised at the economy, comparing the coal fire as shown with gas and coke, but if the result had been taken in