

reproduction of his very rare photograph (19.10 G.M.T.; exposure time, 3 minutes; diaphragm $f/4.5$; $f=14.6$ cm.). Mr. Groenewold, at Bedum, also obtained two photographs of different phases, reproduced in Fig. 2 (A, between 19.00 and 19.05 G.M.T., B, between 19.10 and 19.15 G.M.T.; magnification, 10; exposure 20 seconds; diaphragm $f/6.3$; $f=10$ cm.).

From the *Astronomische Nachrichten* we learn that the phenomena was also seen in north-west Germany,



FIG. 1. Meteor trail of March 24, 1935, photographed by Mr. van Stralen at Grouw.

and Prof. C. Størmer (Oslo) informed us that he received very many observations from Denmark and Norway.

Mr. van Stralen's photograph, and some exact observations from other places, have enabled us to calculate the approximate position of the trail.

For Grouw ($53^{\circ} 5' N.$, $50^{\circ} 49' E.$) the azimuthal direction of the most luminous part was $N. 60^{\circ} 59' \pm 9'$ W. The distance from Grouw is about 500–520 km., which gives a position over the North Sea, near

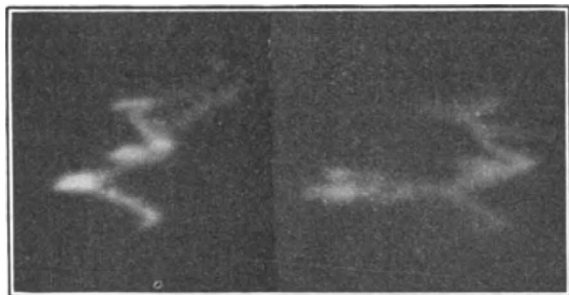


FIG. 2. Meteor trail of March 24, 1935, photographed by Mr. Groenewold at Bedum.

the coast of southern Scotland. The height above sea-level of the luminous part must have been 70–75 km. as deduced from the photograph, and from the time at which the light of the trail disappeared, being the moment of sunset for the reflecting particles high up in the atmosphere. Low and medium clouds did not permit any observation in the British Isles. Also the illumination of the sky was perhaps too great.

The movement of the trail was apparently very slow; from some observations we deduce that the wind direction in this high layer must have been from the east.

W. BLEEKER.

Koninklijk Nederlandsch
Meteorologisch Instituut,
De Bilt, Holland.

July 5.

Ventilation and Domestic Heating

IN a note on domestic heating (NATURE, July 6, p. 16) it is said, "We do not agree with Prof. Bone that a chimney is necessary for the suitable ventilation of bed and living rooms", and add, "Many systems for ventilating rooms have been devised". Now, the nature of the radiations which are used to heat a room have been shown to be of much importance. Dark and dull red heat, in the absence of cool moving air, give stuffy feelings and by congesting the nasal membrane lessen the air-way, as proved by me and confirmed by Dr. W. A. R. Thomson, and by Dr. Dishoeck of Groningen, while bright sources have the opposite effect in about 50 per cent of those observed.

Some people are very sensitive to the quality of radiations, detest dark and dull red sources of heat, and feel a need for open air. It is necessary then that in rooms where electric heating is installed the ventilation should not be just left to an air brick as in the case of some flats now being built for those who are poorly off. Moreover, the air brick may be stopped up, and the electric heater replaced by an oil stove, and the tenants then live in an unwholesome atmosphere. We know that with insufficient ventilation 'droplet' infection becomes much greater. The chimney always secured an unseen ventilation, and allowed of alternative methods of heating. It is, I think, wrong to take this advantage away. We usually lose vigour in winter owing to our stuffy heated rooms, which give us the greenhouse effect in place of sun and cool air. We should not intensify the mischief; and where electric heating is used and no flues built, an efficient means of artificial ventilation would have to be added.

LEONARD HILL.

I THINK that most people prefer a cheerful glow to a dark or a dull red heat. Experiments have recently been carried out by the Department of Scientific and Industrial Research and the Medical Research Council (see *World Power*, 20, 229–304, Dec. 1933) to inquire into Sir Leonard Hill's statements on the 'nose opening' rays due to bright incandescent sources such as lamps, coal-fires and modern gas fires, and the 'nose closing' rays due to non-luminous sources. No evidence was obtained that any difference on 'nose opening' is due to the temperature of the source, either bright or dull, but 'nose-closing' rays were found with the clinical gas lamp specially recommended by Sir Leonard Hill. The conclusion is reached that nose-closing is due to rapid heating of the skin and is independent of the quality of the radiation.

I entirely agree with Sir Leonard Hill's remarks on ventilation. Unfortunately, it is not cheap, but its cost is only a fraction of what would be saved by building houses without chimneys.

THE WRITER OF THE NOTE.