The Svastika on English Walls.—The Solar Eclipse of August 19.

I GREATLY fear that practical builders will be uncourteous enough to smile at Mrs. Murray-Aynsley's idea (NATURE, August 18, p. 364) that the S-shaped iron bars seen on the walls of houses are fire-emblems or survivals of sun-worship. They are common enough in every county of England and elsewhere; in fact, wherever the scamping of jerry builders or the lapse of time has caused walls to give way or bulge outwards. The bolt in the centre is not merely to hang them up, but is the end of a long and strong iron bar passing right through the building and attached to a similar curved brace on the other side, or at any rate fixed to some firm unyielding part of the masonry. The curved shape is simply chosen as that which embraces and gives support to the greatest area of brick or stone surface without the necessity of having a solid, continuous plate.

A propos of sun-worship, it is sad to reflect how much good a little of it might have done in inducing that august but capricious luminary to show himself to the thousands who looked in vain for him on the morning of the recent eclipse. He seems to have shone in splendour in longitudes east of the Urals, where his worshippers abound, but to have hid himself in anger from nearly the whole of unbelieving, scientific Europe.

At Twer, between St. Petersburg and Moscow, where I was myself, the early dawn was beautifully clear; but first a dense ground-mist enveloped us, and then, when enough wind sprang up to clear this away and give us a glimpse of the sun about six-tenths eclipsed, a heavy bank of rain clouds came up and put an end to all hopes of observation. The commencement of totality was pretty well marked by a sudden intense gloom, not, however, greater than (if even as great as) a London fog.

At Berlin placards were extensively posted up a little later in the day stating that "in consequence of the unfavourable weather the eclipse was postponed until the next day." This might have been believed in France or Ireland, but it is harder to take in the Teuton than the Celt. H. G. MADAN.

Eton College.

Large Meteors.

A PEAR-SHAPED fireball, rivalling Venus in brilliancy, passed over Cardigan and Radnor in Wales on August 21 at 11h. 2m. It was observed by Mr. D. Booth at Leeds, and by the writer at Bristol; but the two paths, though likely to be very accurate as regards the *direction* of flight, are somewhat discordant in the beginning and end points. The radiant of the fireball was at 264° + 61° in Draco, and agrees with the two following showers:—

1871 August 20–25	...	...	264° + 64° Tupman.
1887 August 14–23	...	...	264 + 62 Denning.

The meteor referred to appears to have been observed at Bristol much earlier in its track and when considerably higher in the atmosphere than when noticed at Leeds. The mean of the two places gives a height of 80 miles over a point 6 miles east of Aberystwith to 45 miles above a place 7 miles west of Rhayadergwy. The earth point was near Hay, Herefordshire.

It would be important to hear if this fine meteor was observed at any stations in the Midlands, in Wales, or on the south-east coast of Ireland. As seen from Leeds it passed through *Scutum Sobieski*, and at Bristol close to the star *ι Draconis*.

Another fine meteor about equal to Venus was observed here on August 30 at 14h. 25m. It left a bright streak in its path of 18° from 19° + 27° to 5° + 14°. Radiant at 46° + 43° near *β* Persei. W. F. DENNING.

Bishopston, Bristol, August 31.

Colliery Explosions and Atmospheric Pressure.

THERE are few questions so much in need of a satisfactory solution as the relationship which exists between colliery explosions and changes of atmospheric pressure. Before anything was known of the weight, and variations in the weight, of the air, before the barometer was discovered, miners had learned to connect the state of their working-places with weather changes. The old pits were very shallow, the workings very limited, and the ventilation practically left to take care of itself, so that it is not difficult for us to understand the effect of temperature rather than pressure on the atmosphere of the mine. "Trefoil damp," "pease bloom damp," &c., sufficiently indicate the summer prevalence of the danger; in winter "the damps were scarcely felt or heard of." In the early part of the present century Mr. John Buddle, the Newcastle viewer, having watched his barometer and the mining reports became strongly of opinion that "accidents from fire-damp always occur with a low barometer." Faraday and Lyell's Report on the Haswell disaster of 1844 dwelt upon the importance of officials taking into account the variations of the barometer in the management of mines. Since then numerous public Commissions and private inquirers, English and foreign, have investigated the connexion supposed to exist between the exudation of gas and a *falling* barometer. The earlier decisions may be said to favour Mr. Buddle's opinion, but of late years there appears to be a tendency to declare that the effect of a low or falling barometer has been considerably over-rated—that in reality it has little or no influence. Under whatever conditions of pressure explosions formerly occurred, it is perfectly clear from the experience of recent years that disasters take place, as a rule, when there is an excess and not when there is a deficiency of pressure.

Mr. Dobson's Report to the British Association in 1855 showed from a large, though imperfect, number of observations that up to the year 1854 accidents from fire-damp were most frequent in the summer months June and July, the minimum at the end of January; the results being taken to prove indisputably the general dependence of explosions upon the seasons of the year.

In the papers communicated to the Royal and to the Meteorological Societies between 1872 and 1874 by Messrs. Scott and Galloway, it was however shown from 1369 accidents in twenty consecutive years that the maximum occurred at the end of January, the minimum in the middle of September.

These very different results may be regarded as indicating the great revolution which has taken place not only in the time at which explosions occur, but also in the conditions of mining operations. Pits are now of enormous depths, with most extensive galleries, and the ventilating appliances are of the most elaborate description. Possibly these changes have modified very greatly the effect of weather variations. It must be remembered that gas exists in mines under two quite distinct conditions, that in the goaves and waste places being free and in direct contact with the air, while the gas occluded in the solid coal or imprisoned in faults is not in direct contact with the atmosphere. In the former case it is generally agreed that the accumulations of gas expand or contract with the changes of atmospheric pressure. In the latter case we know that the gas exists in the coal at a pressure of many atmospheres, so that it is highly improbable that it is affected directly by the rise and fall of the barometer. Indirectly, however, it would seem that a very important effect results, but in direct opposition to the idea that it escapes only with a falling barometer.

Serious explosions are almost exclusively confined to deep mines, where the management is perfect, and where every care is taken to insure safety. Mystery surrounds each disaster, and it is left to individuals to trace them to coal-dust, gas, or some other favourite theory. Fortunately the illiterate manager has given way to a different order of men, and from the interest taken by mining engineers there is reason to believe that much of the uncertainty which at present envelops the question will be removed before long. Barometers are now common to all mines, and they are studied with more or less interest by the officials. For years past it has become clear to them that there is no apparent connexion between the escape of gas and a falling barometer: the firemen "in ordinary cases can forestall the barometer by from twelve to twenty-four hours." This conclusion, based upon the ordinary observations of officials during their daily routine of duty, has been confirmed by more precise and carefully-planned systems of collecting information.

Following the Seaham disaster of September 1880 (when the centre of an anticyclone was over the northern counties), Mr. Corbett arranged hourly observations, day and night, for several months, showing the atmospheric pressure, the measurements of gas which had escaped into the workings, and by means of water-gauges the movements of the gas in parts of the workings sealed from contact with the air. The water-gauges indicated an out-bye pressure as much as 33, 35, 41, and 48 hours before the barometers began to fall, while gas in measurable quantities was to be found many hours before the mercury gave signs of falling. On the Continent somewhat similar observations have