the corpuscular eclipse which was due at about this time. But observations on the ion content on August 24 (not shown in the figure) showed a similar outburst of variation at the same time. The outburst of the variation on August 21 at the time of the corpuscular eclipse was therefore probably a mere coincidence.

2. The ionisation of the E layer increases with the progress of the day on August 20. On the day of the eclipse, curve 2(E), however, the ionisation starts decreasing from 8 a.m. and forms a well-defined trough of minimum value at 11.33 a.m. about twenty minutes after the optical maximum. On August 22, curve 3(E), the day after the eclipse, the gradual rise of ionisation with the progress of the day is entirely absent.

3. It can be concluded from these observations that the ultra-violet light is at least one of the agencies producing ionisation of the E layer, and that the corpuscular rays have little or no effect as an ion producing agency. The absence of regular rise of the E layer ionisation on the day after the eclipse can be accounted for by the fact that the eclipse occurred at an hour when the sun's action is greatest. The effect of the withdrawal of the ionising agency during this active period produced a quasi-permanent deficiency in the ion content which persisted until the next day. It will be noticed that on the day of the eclipse the ionisation had a tendency to fall after 12.30 p.m., curve 2(E). This also is due to the same reason, namely, the withdrawal of the ionising agency at the time of its most intense action.

More definite information about the nature of the ionising agencies other than ultra-violet light can only be obtained by a large number of stations participating in observations during a solar eclipse. It may then be possible to discriminate between fortuitous outbursts of variations in the ion content and variations caused by the eclipse.

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[1] Appleton, NATURE, 120, 330, Sept. 3, 1927.
[2] Mitra and Rakshit, *Phil. Mag.*, **15**, 20; 1933.
[3] Chapman, *Proc. Roy. Soc.*, A, 132, 353; 1931.
[4] Chapman, *Mon. Not. Roy. Ast. Soc.*, **92**, 413; 1932.
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Rainfall and Atmospheric Pollution

SEVERAL considerations which have been set out at some length in a paper to the Royal Meteorological Society[1] point to an increase of rainfall as a consequence of smoke in the atmosphere.

In a factory town Sunday is a day of reduced smoke pollution and concurrently Sunday is, in the long run, the day of least rainfall of any day of the week. There is in the Rochdale record of thirty years an exception to this rule in the years 1915–1918 inclusive—the years of the War. In that period of four years Sundays were not less but on the average more in rainfall than other days of the week. For example, in the long period of thirty years the ratio of rain on Sundays to all days of the week is 0·94, but in the War period 1·28. In another factory town —Halifax—the ratio of Sunday rainfall to that of all days on the average of 19 years is 0·98 but during the War period 1·12.

It seems, therefore, that the emission of smoke due to the running of munition and other factories on Sundays in War time has been sufficient to influence the rainfall. This unexpected result can scarcely be accepted without evidence in support of it in other directions.

At Llanfairfechan in North Wales there is a trustworthy record of thirty years or more, and an analysis of this record shows that Sunday is the day of least rainfall, the ratio of Sundays to all days being 0·93 for a period of twenty-eight years. Llanfairfechan lies under the shadow of Penmaenmawr Head on which up to a height of 1,500 feet drilling by steam power, blasting and quarrying go on vigorously on the working days of the week, but no work has been done either before or after or during the War on Sundays.

Now the ratio there of Sundays to all days is 0·95 for the War period, which differs but little from what it is at other times, Sunday being not more but less than weekdays. Here where there are no industrial activities on Sundays in War time, the Sunday rainfall is, as at other times, less than on weekdays.

Again sootfall in factory areas was certainly greater in the War period than usual. Observations are meagre, and there are not many suitable records which can be examined, but the available facts are briefly tabulated below, the figures being the average atmospheric deposit in tons per sq. mile per month.

Place	*War Time*	*Other Times*
Glasgow	38	33
Newcastle	50	41
Rochdale	77	67
Malvern	6	7

Malvern, which is not an industrial town, is inserted for comparison. The deposit there is nearly the same at all times, but with the industrial towns the War time deposit is considerably greater.

Unfortunately, there is no means of ascertaining whether the extra pollution took place on Sundays, but it is significant that the ratio of the War time deposit to that at other times is in each industrial area what might be expected if an extra day's work were put into the week.

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[1] *Quart. J. Roy. Met. Soc.*, **55**, No. 232, Oct. 29.

The N- and O-Series and N-Absorption Edge of X-Spectra

IN a letter to NATURE[1] in 1922 I announced, from researches made in the laboratory of Prof. Siegbahn in Lund, the existence of a weaker group of lines in the X-region, 9–13 A., referred to the N-series of the elements uranium and thorium.

The X-rays region has meanwhile been enlarged for long wave-lengths by the use of a line grating from work done by Compton, Thibaud, Siegbahn and others. But most of the N-lines are so weak and