were only penetrating enough to pass through the counter set in London ($\lambda = 54°$), and too absorbable to penetrate the 12 cm. of lead shield which protects the ionization chamber in Cheltenham ($\lambda = 51°$). Consequently, it is probable that the energy of the abnormal primary particles did not extend much further than 6×10^9 eV. Owing to the absence of reliable counter measurements at magnetic latitudes higher than 44°, it is difficult to estimate the contribution of primaries of such an energy to the cosmic-ray intensity at sea-level. But it is obvious that the smaller this contribution is, the greater will be the proportion of new particles represented by the peak value of Fig. 1 in relation to the number of particles of the same energy at normal times. If the normal is, say, 1 per cent, then we have been receiving, during some hours of the night of August 13–14, a stream of more than twenty times the normal number of $5–6 \times 10^9$ eV. particles.

Janossy[4] and later Vallarta[5] have pointed out that the magnetic field of the sun may be responsible for the latitude 'cut-off' effect in the cosmic-ray energy spectrum incident on the earth. If so, one could imagine that on August 13–14 a disturbance of the sun's magnetic field occurred which allowed particles to reach the earth that otherwise would have been stopped. But according to Epstein's[6] calculations, in order to cut off particles of 5×10^9 eV., it would be necessary for the heliomagnetic field to be of a value much greater than 50 gauss, which is the upper limit obtained from spectroscopic measurements. Such a value is very unlikely.

So far as is known to me, there has never before been recorded so great an increase of cosmic rays which has extended for such a length of time. On August 17, 1941, our apparatus registered a quite abrupt increase of more than 30 per cent, which lasted only from 1h. until 3h. Also last March two sudden increases of about 7 per cent were recorded in Cheltenham[7] and London, which lasted not more than four hours each. But these were probably associated with magnetic storms.

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Composition of Chlorine Hydrate

THE composition of chlorine hydrate has been the subject of much experimental work. Faraday, by analysis, found the composition to be $Cl_2.10H_2O$. The composition has also been determined analytically by Roozeboom[1] who found $Cl_2.8H_2O$, Bouzat and Azinières[2] who found $Cl_2.6H_2O$, and more recently by Anwar-Ullah[3] who agreed with this last formula. De Forcrand[4] used an empirical rule to calculate the number of molecules of water present. According to de Forcrand's rule, if ΔH is the heat of dissociation of the hydrate into gaseous chlorine and ice, and T the temperature at which the dissociation pressure is 760 mm., then $\Delta H/T$ is a constant the value of which is approximately 30. The value of T is known from the dissociation pressures determined experimentally by Roozeboom, and this gives a value of ΔH equal to 8,478 cal./gm. mol. Since de Forcrand's rule is only an approximation, this value of ΔH is very inaccurate. De Forcrand determined the heat of dissociation of the hydrate into gaseous chlorine and water by measuring the heat of solution of the hydrate in water and obtained a value of 18,360 cal./gm. mol. The number of molecules of water present in the hydrate is then given by $n = 18,360 - 8,478/1,436 = 6 \cdot 88$, the latent heat of fusion of ice being 1,436 cal./gm. mol. De Forcrand therefore assumed the composition to be $Cl_2.7H_2O$.

The true composition of the hydrate can be found by calculating the heats of dissociation into gaseous chlorine and ice, and gaseous chlorine and water respectively, using the dissociation pressure data of Roozeboom[1]. The graph of log p against $1/T$ is found to be linear in both cases, and from the slopes of the two lines the heats of dissociation are respectively 6,413 and 17,870 cal./gm. mol. The number of molecules of water in the chlorine hydrate molecule is thus $17,870 - 6,413/1,436 = 7 \cdot 97$; and there is little doubt, therefore, that the correct formula is $Cl_2.8H_2O$.

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Name for Element 85

MAY I be permitted to register a protest at the ungainly name suggested for element 85 by Mrs. A. Leigh-Smith and A. Minder[1]. The more science has been divorced from the humanities the more has mankind been afflicted by unpleasing words. Even so, this word 'anglo-helvetium' surely exceeds the limits of toleration. Assuming its existence to be confirmed and the chemistry of this element to be worked out, are we to talk of hydroanglo-helvetic acid (formula HAh perhaps) and of the peranglo-helvetates? By comparison with the possibilities which might be made of anglo-helvetium, we may come to regard dysprosium and praseodymium as old friends.

I make no claim to special knowledge of the English or classical tongues, but it does seem reasonable to suppose that since the other halogens have been named so elegantly from the Greek, it might be possible to find a fairly short word similarly derived which could serve as a name for this last halogen. The word 'leptine' (Greek *leptos*) has been suggested to me, but I mention it merely to illustrate the sort of thing that might be done to provide a euphonious and reasonably short word which could be easily transcribed into the principal European languages.

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