The appearance of the unusual nuclei was accompanied by prolonged, continuous rain, which is abnormal in these latitudes at this season. On January 14 the rain changed to showers; but heavy rain fell on January 17 and 18. The secondary maximum on January 30 was accompanied by many thunderstorms, after which the rains gradually died out.

Aircraft observations indicated that some of these rains were of 'warm' type; thus it appears that though the nuclei have been detected due to their exceptional freezing ability, they can also serve as efficient warm rain nuclei.

At first it was suspected that the abnormal nuclei were residues from the hydrogen bomb explosions, and the results were communicated privately to a number of scientific centres. As a result, Vincent J. Shaefer and Dr. E. G. Bowen reported that they had also found exceptionally heavy ice nucleation on Mount Washington and in Australia respectively on January 13. This apparent world-wide increase in nuclei agrees strikingly with the dates expected from Bowen's[2] meteoritic hypothesis and would seem to confirm it.

It would seem most desirable that regular measurements of ice nuclei having various threshold temperatures and of condensation nuclei should be made at a number of observatories widely distributed over the world, in view of their importance if Bowen's hypothesis is found to be correct.

Note added in proof. On May 23, 1955, nuclei with the threshold −13° C. were observed again and were present for two days. These nuclei correspond to the meteoric shower of Lyrids (April 21).

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Isotope Shifts in the Spectrum of Helium

Experiments on various line series in helium[1,2] show that Hughes and Eckart's treatment[3] of the 'specific' isotope shift in this case is inadequate. Their wave functions take no account of configuration interaction, to which the specific effect is very sensitive.

The specific shifts of the 2^1S, 2^3S terms of helium have now been calculated in the usual first-order perturbation treatment, using the wave functions of Hylleraas and Undheim[4] and Huang[5]. These wave functions include configuration interaction in an adequate manner. The constants for the Hylleraas–Undheim triplet function were kindly supplied by Prof. E. A. Hylleraas. The coefficients in their singlet function were calculated from the original data.

The results of the calculations are compared with experiment in Table 1. Some approximations were made in the calculation with the Huang triplet function; but it is estimated that the specific shift is accurate to the two significant figures given in the table. The results disagree with those found by Hamermesh and Eisner using the Huang wave functions and quoted by Fred *et al.*[1]. The experimental values are taken from Bradley and Kuhn[2], who estimated the term shifts by extrapolating the observed shifts of lines $2S—nP$ to the series limits. Fred *et al.*[1] found a residual shift of about 0·135 cm.$^{-1}$ for the 2^1S state, which agrees well with the value 0·13 cm.$^{-1}$ given by Bradley and Kuhn.

Table 1

Shift	Term	Wave function: Hughes and Eckart	Wave function: Huang	Wave function: Hylleraas and Undheim	Exp.
A	2^1S	0	0·159	0·149	0·13
A	2^3S	0	0·076	0·0758	0·10
B	2^1S	1·436	1·595	1·585	1·57
B	2^3S	1·723	1·799	1·799	1·82

A = total term-shift minus normal term-shift (cm.$^{-1}$).
B = total term-shift (cm.$^{-1}$).

The total term-shifts obtained from the calculations are all close to the experimental values. It is concluded that nuclear motion makes by far the most important contribution to isotope shift in helium. Further details will be published elsewhere.

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Time Interval between Nucleogenesis and the Formation of Meteorites

While determining the radiogenic argon-40 content of the Beardsley chondritic meteorite[1], a mass spectrometric search for xenon-129 produced by decay of iodine-129 was made. The total amount of xenon which was observed was 5×10^{-9} c.c. (s.t.p.) from a 29·86-gm. meteorite sample. Within the limits of experimental error, this xenon had a normal isotopic composition[2]. The ratio of xenon to argon-36 was in essential agreement with that found in air, indicating that this xenon was due to atmospheric contamination. Since a 30 per cent increase in the abundance of xenon-129 over that observed in normal xenon would have been observable, this indicates that radiogenic xenon-129 was present in this meteorite to less than $1{\cdot}3 \times 10^{-11}$ c.c. (s.t.p.)/gm. H. E. Suess and M. G. Inghram (personal communication) have suggested that if the meteorites had been formed soon after the formation of the elements, they would contain an excess of xenon-129 due to decay of iodine-129.

A lower limit for the time-interval t between the formation of the elements and the last crystallization of the meteorites may be calculated by assuming that iodine-129 and iodine-127 were originally made in equal abundance, and that there has been no loss of xenon due to diffusion since the meteorite was last crystallized. The iodine-127 content is taken to be 1 p.p.m. by weight, based on the values reported by Fellenberg[3] for other stony meteorites. The equation for t is

$$t = \frac{T_{1/2}}{0{\cdot}693} \ln \frac{^{129}\mathrm{I}}{^{129}\mathrm{Xe}}$$

where $T_{1/2}$ is the half-life of iodine-129, ^{129}I is the amount of iodine-129 originally formed and ^{129}Xe is the amount of xenon-129 now present in the meteorite due to the decay of iodine-129.