remote from that to which the top has fallen" (see my former letter). If this is the case, it would be strong proof that the explosion actually took place in the core. I shall probably have no opportunity of visiting the spot again for many months.

My recollection is that there are no trees within several feet of the line joining the two damaged ones, which stood in what now looks like an opening in the wood. Mr. Pickering can perhaps check this also. A. F. GRIFFITH.

15 Buckingham Place, Brighton.

IN several letters lately published in NATURE, an explosion in or by a tree trunk is mentioned. Such an explosion occurred here during the great storm of July 12 last. The lightning struck an old crab-tree, at the base of the trunk, and exactly at the ground-line. The crab was growing on the top of a grassy bank. The lightning tore the bank open from top to bottom, tore open and splintered the roots of the crab, and threw pieces of roots and turf, all in one direction, for 21 feet; the turf was in large pieces, of about a foot cube.

A tiled barn near here was, at the same time, struck in a peculiar manner. The lightning struck the upper tiles near a gable; one tile was torn out and hurled away, and several other tiles were neatly perforated with round holes, each about ¼ inch in diameter; the tiles were red, and the holes were burnt grey all round. The wooden pegs belonging to the perforated tiles were blackened by the heat. W. G. S.

Dunstable.

On the Remarkable Form of Hailstones.

WITH reference to the description given in NATURE (vol. xl. pp. 151 and 272) of the hailstorm at Liverpool, it will probably be interesting to bring under notice an early account of the remarkable forms often possessed by hailstones; it is to be found in the *Edinburgh Philosophical Journal* for 1824, vol. xi. p. 326. The writer of the said article states that "in the second part of the eleventh volume of the 'Nova Acta Physico-Medica Academiæ Cæsareæ Leopoldinæ Carolinæ Naturæ Curiosorum,' Dr. Nögerath informs us, that, on May 7, 1822, a tremendous hail-shower fell in and around Bonn. . . . The general size of the hailstones was about one inch and a half in diameter, with a weight of nearly 300 grains. When whole, which was not generally the case, the general outline was elliptical or compressed globular, and the form *cerebral*, or resembling the brain of a warm-blooded animal. . . . More frequently the form was lenticular, and appeared polished on the two ends, as if by friction. The masses had a concentric lamellar structure; in the centre was a white, nearly opaque, nucleus, of a round or elliptical form, around which were arranged concentric layers, which increased in translucency from the innermost to the outermost. They at the same time exhibited a beautiful stellular fibrous arrangement, caused by rows of air-bubbles disposed in radii. . . . Captain Delcross, in the thirteenth volume of the 'Bibliothèque Universelle,' describes hailstones having the concentric lamellar structure and stellular fibrous arrangement. . . . The surface was provided with pyramidal forms. . . . When the edges and the angles of the pyramids are melted down, the *cerebral* form is produced; when the masses of hail, having the structures described, burst asunder, the fragments have a pyramidal form, and then forms what has been described under the name of *pyramidal hail*." The writer then proceeds to describe hailstones which fell on June 27, 1823, at Aberdeen. "They (the hailstones) were included, almost universally, each by five sides or surfaces, four plane, constituting the sides of an irregular pyramid, and one spherical in place of a base. . . . The spherical surface appeared, to the depth of one-twentieth or one-thirtieth of an inch, to be solid as it was transparent. The rest of the hailstone was opaque, consisting of crystals or minute columnar forms, perpendicular to the spherical surface." Eight figures, illustrative of the different kinds of hailstones, are given (Plate ix.).

Miss Holt refers to the metallic taste and the flavour of ozone possessed by those which fell at Liverpool. The presence of NH_3 in hailstones was long ago established by Mène (*Comptes rendus*, May 19, 1851). J. SHEARSON HYLAND.

14 Hume Street, Dublin.

Erinus hispanicus (?) on the Roman Wall.

THE accompanying note on this alien Scrophulariaceous plant will, I think, be of interest to many of your readers, more especially to those who, as members of the British Association, took part in the excursion on Thursday last from Newcastle to the Roman Wall.

The plant occurs on some Roman remains at Chesters, Chollerford, Northumberland, the residence of Mr. John Clayton. In the recent editions of Dr. Bruce's "Hand-book to the Roman Wall," it is named *Erinus hispanicus*, but it appears to have been previously known as *E. alpinus*. In endeavouring to determine its authoritative name, I have ascertained that the plant was called *E. hispanicus* by Persoon ("Synopsis"), who regarded it as a doubtful species, whereas all other authors regard it as a variety of *E. alpinus*. There is a specimen, apparently of this plant, in the Oxford Herbarium, collected by Endress ("Plantæ Pyrenaicæ exsiccatæ, Annis 1829-30 lectæ") which he calls *E. alpinus*, var. *lanuginosus;* Grenier and Godron ("Flore Française") call it *E. alpinus*, var. *hirsutus;* Lange calls it *E. alpinus*, var. *villosus;* and Willkomm and Lange, in their "Flora Hispanica," follow Grenier and Godron, giving the other names as synonyms. It will doubtless be best to accept Willkomm and Lange's conclusion, and adopt the name *E. alpinus*, var. *hirsutus*, Grenier et Godron.

I may add that *E. alpinus*, L., is mentioned, in Babington's "Manual of British Botany," as occurring near Tanfield, in Yorkshire, a locality which is also given in the last edition of Hayward's "Botanist's Pocket-Book." However, in Arnold Lees's "Flora of West Yorkshire" (1888), it is stated that this plant has disappeared from Tanfield. Consequently Chesters is now the only English locality for *Erinus*, and the only form is the var. *hirsutus*. SYDNEY H. VINES.

Oxford, September 23.

Noctilucous Clouds.

THE recent communications in NATURE in relation to apparently self-luminous cloud-like bands in the skies after nightfall, call to mind the analogous phenomena of noctilucous clouds involving the whole visible firmament.

We are indebted to the indefatigable industry and zeal of the illustrious Arago for the collection of the scattered facts relating to the phenomena of self-luminous clouds of divers kinds.[1] According to the records collected by him, noctilucous bands and zones of clouds are sometimes associated with the electrical manifestations accompanying distant thunderstorms. To this class belong the luminous phenomena noticed by Rozier on August 15, 1781, and by Nicholson on July 30, 1797. In other cases, the association of the phenomena with electrical disturbances, is by no means obvious. To this class belong the luminous clouds observed by Beccaria over his observatory at Turin; likewise the luminous appearances witnessed by Deluc near London, and also those observed by Major Sabine over the Isle of Skye in Scotland. In all these cases, the noctilucous condition of the clouds was localized and confined to bands or zones in limited portions of the sky. But under certain conditions this apparently self-luminous property of the nocturnal clouds involves the entire visible hemisphere. It is to this latter aspect of the noctilucous phenomena that I desire to call attention.

Omitting the consideration of the exceptionally rare and anomalous phenomena of so-called phosphorescent "dry-fogs," as those of 1783 and 1831, in which the luminosity was so pronounced as to enable one to read ordinary print at midnight, we come at once to the generally recognized phenomenon of that faint diffused cloud-luminosity which enables the "country doctor," with comparative security, to perform his lonely midnight drives on cloudy moonless nights. Frequently the glow is so faint that it is only possible to observe it at a distance from cities and large towns, in places where the air is free from smoke, and where the darkness of the sky is not affected by the general illumination due to gas and electric lights.

The conditions under which the phenomena most conspicuously manifested themselves to my observations were during the incipient stages of the autumnal north-east storms occurring

[1] *Annuaire du Bureau des Longitudes pour l'An* 1832, pp. 246-50; *ibid.*, 1838, pp. 279-85. "Œuvres Complètes de Arago," vol. iv. pp. 70-77. Arago's "Meteorological Essays," translated by Sabine, pp. 48-53 (London, 1855).

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