

### Historic Natural Events.

**Dec. 14, 763. Cold Winter in Western Europe.**—The winter of 763–4, the first concerning which details are extant, appears to have been very cold in western Europe. Winter began early in October, but the greatest cold continued from Dec. 14 until Mar. 16. It extended over the whole of Europe, from England to the Black Sea. The Bosphorus and neighbouring parts of the Black Sea were frozen; in several countries the snow was 30 ft. deep in places, and in Gaul the olives and figs died, the corn froze in the soil, and in 764 a terrible famine desolated a vast region and cost a multitude of lives. The Danube and other rivers were frozen, as was the sea for a long distance from the land. Holinshed records: "There fell such a marvellous great snow, and therewith so extreme a frost, as the like had not been heard of, continuing from the beginning of the winter almost till the midst of spring, with the rigour whereof trees and fruits withered away, and not only feathered fowls, but also beasts on the land and fishes in the sea died in great numbers." It is not mentioned in the Anglo-Saxon Chronicle, but an entry in 761 records: "This year was the severe winter", and there may be some confusion of dates.

**Dec. 16, 1857. Neapolitan Earthquake.**—This earthquake is notable as the first in which an attempt was made to estimate the depth of the focus. By numerous measurements of the inclination of fissures in buildings, etc., Mallet found that the depth was about  $6\frac{1}{2}$  miles.

**Dec. 16, 1877. High Pressure over Siberia.**—At Semipalatinsk in Siberia the barometer at 9 P.M. read 784.5 mm., equal to 1046 mb. or 30.886 in. The height of the station is not known exactly, but is estimated as 590 feet, and on this basis the pressure corrected to sea level is 1075 mb. (31.75 in.). This is the highest known pressure at sea level. At 7 A.M. on Dec. 17, a reading of 787.4 mm. (1050 mb. or 31.00 in.) was recorded at Barnaoul, a few degrees east of Semipalatinsk. The height of this station is 480 feet, and the pressure reduced to sea level, 1073 mb. (31.69 in.).

**Dec. 16, 1920. Great Chinese Earthquake.**—One of the greatest earthquakes known to us occurred in the provinces of Kansu and Shensi in north-west China. The area disturbed must have been more than three million square miles, the largest yet known. The number of persons killed, chiefly residents in caves in the river-banks, was estimated at 180,000.

**Dec. 16–21, 1925. Tropical Cyclone in Pacific.**—A violent cyclone visited the Union, Samoa, and Cook Islands. A cyclone wave swept over Atafu in the Union Islands, and great damage was done by the wind at Rarotonga (Cook Islands).

**Dec. 17, 1664. Comet.**—Under this date Pepys wrote: "Mighty talk there is of this Comet that is seen a' nights, and the King and Queene did sit up last night to see it, and did, it seems."

**Dec. 18, 1896. Ball Lightning in Devon.**—During a thunderstorm at Brixham, Devon, a globe of light appeared in a field, travelling from west to east, tearing up the ground. It reached a small house, broke a hole in the closed door, knocked a hole in the wall, and continued along a rope walk, where it killed one man and gravely injured another.

**Dec. 19–22, 1929. Snowstorm in Texas.**—Snow is rare in central Texas, but in this storm the depth of snow exceeded two feet in places and traffic was disorganised; at Hillsboro 26 inches fell in less than 48 hours. Two inches of snow fell even on the coast,

where such a phenomenon is almost unprecedented. The pressure distribution on Dec. 18 showed a deep depression over the Gulf States, bringing in large quantities of moist air, while a cold wave was advancing from an intense anticyclone over Montana, associated with temperatures below 0° F. The snow-storm accompanied the progress of this cold wave, first southwards and then eastwards to the coast.

**Dec. 20, 1564. Severe Winter in Europe.**—The winter of 1564–65 was very severe over the whole of Europe. The cold began about Dec. 20, and Holinshed states that on New Year's Eve "people went over and amongst the Thames on the ice, from London Bridge to Westminster. On Jan. 3 at night, it began to thaw, and on the fifth there was no ice to be seen between London Bridge and Lambeth, which sudden thaw caused great floods, and high waters, that bare downe bridges and houses, and drowned manie people in England, especially in Yorkshire. Owes Bridge was borne awaie, with others." The Zuider Zee and all the great waters of western Europe were frozen; on the Continent the cold continued until Mar. 24.

### Societies and Academies.

#### LONDON.

**Physical Society, Oct. 17.**—J. P. Andrews: (1) A simple approximate theory of the pressure between two bodies in contact. The approximation makes use of two principles: (a) The displacement at the centre of the circle of contact is twice that at its edge, and (b) for the purpose of calculating the stresses we may replace the two bodies by a single sphere of which the circle of contact is a diametral section, and write the strain at any point as the ratio of the displacement of that point to the length of the line drawn from the point to the sphere in the direction of displacement. When the elastic modulus by which this is multiplied is taken as that appropriate to a rod with sides fixed, the agreement with accurate theory is close. Principle (a) remains nearly true for elliptical areas of contact.—(2) Experiments on impact. For soft metallic bodies and impact of equal spheres, for small velocity of approach  $v$ , duration of contact varies inversely as  $v^{1/2}$ , while the coefficients of restitution  $e$  are unity for all speeds below a value characteristic of each material. Duration of contact has no effect upon the size of the permanent deformations. For variation of duration of contact  $t$  with mass of sphere at high speeds of approach,  $t$  varies as the square root of the mass, as theory predicts.—(3) Observations on percussion figures. Steel ball on glass blocks. Diameter of innermost circular or part-circular crack remains constant for one specimen of glass, and is independent of the maximum pressure exerted by the ball on the glass; diameter of outermost circular or part-circular crack varies with the maximum pressure in a manner which suggests that the crack tends to keep to the outer edge of the area of contact. No crack is formed until the pressure exceeds a value characteristic of the glass.

**Geological Society, Nov. 5.**—H. Williams and O. M. B. Bulman: The geology of the Dolwyddelan Syncline (North Wales). The syncline lies east of Snowdon and south of Capel Curig, extending along the Lledr Valley westwards from the village of Dolwyddelan. The rock-sequence is closely comparable with that determined by the senior author on Snowdon, and the pyroclastic rocks of Dolwyddelan are, in effect, the attenuated and ragged margin of the great Snowdonian volcanic mass. The central portion of the northern limb of the syncline has been