

If the law of radiation pressure can be taken as still holding when the radius is reduced to  $a=10^{-6}$ , the acceleration is 2 cm./sec.<sup>2</sup>. This implies that such a particle of dust, in a vacuum, and between vertical walls respectively at 27° C. and 127° C. would not fall vertically, but would deviate about 2 mm. per metre towards the colder wall.

The effect found by Prof. Osborne Reynolds (*Phil. Trans.*, ii., 1879, p. 770) on a silk fibre exposed to radiation from a hot body, and assigned by him to "radiometer" action, is far larger than this. The radius of the fibre was 0.000625 cm., and its length was probably about 15 cm. When it was hung up in a test tube containing hydrogen at atmospheric pressure, and was exposed to radiation from a neighbouring jar filled with boiling water, the lower end of the fibre moved through 0.01 cm. This would imply an acceleration of about 0.7 cm./sec.<sup>2</sup>, about sixty times the acceleration on a dust particle of the same radius under the conditions assumed above. The action detected by Reynolds increased, too, very rapidly as the pressure fell, being ten times as great when the pressure was reduced to 1 inch of mercury.

J. H. POYNTING.

The University, Birmingham, December 15.

#### The Date of Easter in 1905.

ALREADY queries have been addressed to me on the subject of the date of Easter in 1905, owing to the fact that, according to the almanacs, the moon is full at 4h. 56m. Greenwich mean time on the morning of March 21 next, and that therefore, according to the Prayer Book rule, it would appear that Easter Day should be the Sunday following March 21, viz. March 26. As the misunderstanding on the subject seems widely spread, perhaps you will allow me to explain that the "moon" referred to in the ecclesiastical calendar is not the actual moon in the sky, which is full at a definite instant of time, but a fictitious moon, the times of the phases of which are so arranged as not to differ much from those of the actual moon. These phases are held to occur, vaguely, on certain days, and therefore hold good for all longitudes, and so avoid a practical inconvenience that would arise from the use of the actual moon. Thus, in the instance before us, in which the actual moon is full at 4h. 56m. a.m. Greenwich mean time, the same moon is full at 11h. 48m. p.m. (on the preceding day) Washington mean time. The people adopting Greenwich time would, therefore, in the supposed circumstances, keep Easter Day on March 26, whilst those adopting Washington time would keep it on April 23.

Perhaps the simplest expression for the date of the Paschal full moon is March (44-epact), which gives the date directly when the epact is less than 24. When the epact is equal to or greater than 24, this expression gives the date of the preceding full moon, and the Paschal full moon is found by adding 29 to this date.

Thus in 1905 the epact is 24, therefore the calendar moon is full on March 20, and again on April 18. The latter is, by the rule, the Paschal full moon, and Easter Day is the following Sunday, viz. April 23.

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#### Lepidocarpon and the Gymnosperms.

THE concluding sentence in your note on Mr. H. E. H. Smedley's admirable models of the fructifications of Palæozoic plants (*NATURE*, December 22, p. 183) may possibly be misleading to some of your readers. As the models of *Lepidocarpon* shown in your figure were prepared from my instructions, I may be supposed to share the responsibility for the hypothesis of an affinity between the lycopodiaceous cones and the Gymnosperms, stated to have been urged by "the author," especially as the points of agreement mentioned are quoted, with some slight abridgment, from my paper on the seed-like fructification of *Lepidocarpon* in the *Philosophical Transactions*.<sup>1</sup> Such

<sup>1</sup> *Phil. Trans. R.S.*, Series B, vol. cxciv., 1901, p. 320. See also *NATURE*, vol. lxiii., 1900-1901, pp. 122 and 506.

an affinity has never appeared to me to be probable. The characters cited—the presence of an integument and micro-pyle, the single functional megaspore, and the detachment of the indehiscent, seed-like organ as a whole—are important points of analogy with true seeds, but in *Lepidocarpon* "these organs differ too much in detail from the seeds of Gymnosperms to afford any evidence of affinity."<sup>1</sup> I doubt whether my friend Mr. Smedley really intended to suggest anything more than an analogy.

As regards the Gymnosperms, evidence has been accumulating for some time past indicating their connection with the fern-phyllum rather than with the Lycopods. Some account of this evidence will be found in my discourse at the Royal Institution on the origin of seed-bearing plants (1903),<sup>2</sup> while a more recent summary is given in Mr. Arber's article on Palæozoic seed-plants in *NATURE* for November 17, p. 68.

The seed-like organs of some Palæozoic Lycopods, such as *Lepidocarpon* and *Miadesmia*,<sup>3</sup> seem to be cases of homoplastic modification, and not to be indicative of any affinity with those groups of seed-plants which have come down to our own day.

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#### Fishing at Night.

THE notice in your Journal of the "Sea Fishing Industry," written by Mr. Aflalo, suggests to me that he or some other of your readers may inform me why sea fishing takes place for the most part at night. I have heard the subject discussed all my life, and the answers have been of the most opposite and unsatisfactory character, such as to obtain a supply of fish for the morning markets, and because fish come nearer to the surface in the dark. Everyone must be familiar with the sight of our fishing boats preparing to take their departure as the evening approaches in the different harbours on our coasts. Some of the masters, unfortunately, like the Apostle Peter, have toiled all night and caught nothing.

S. W.

December 20.

#### A New British Bird!

A FINE example, a male, of the Pacific eider-duck, *Somateria v-nigrum*, was killed at Scarborough on December 16. This is the first recorded instance of the occurrence of this bird on our shores. Closely resembling the common eider, *Somateria molissima*, it may yet be readily distinguished therefrom by the bright orange colour of the bill, and the sharply defined, black V-shaped mark on the throat—hence the specific name *v-nigrum*.

The Pacific eider occurs in abundance along the coasts of north-western America and north-eastern Asia.

W. P. PYCRAFT.

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#### Intelligence of Animals.

IN reference to the question of intelligence in animals, it may be of interest to mention a case of distinct reasoning power in a cat which for nine or ten years associated himself with our family; he would have scorned the suggestion that he belonged to it. When he found himself on the wrong side of a closed door—a very constant occurrence—he stood up and, catching the handle in his fore paws, rattled it. I do not think he tried to turn the handle, but he certainly knew that it played an essential part in the opening of the door. He is now no more, and *de mortuis nil nisi bonum* bars any further reference to his career, for he was a dissipated old scoundrel; but it is a pleasure to me to pay, with your permission, the above little tribute to his memory.

Greenock, December 17.

T. S. PATTERSON.

<sup>1</sup> *Phil. Trans.*, loc. cit., p. 324.

<sup>2</sup> *NATURE*, vol. lxviii., p. 377.

<sup>3</sup> Miss M. Benson, "A New Lycopodiaceous Seed-like Organ," *New Phytologist*, vol. i., 1902, p. 58.