

cussed here. Mr. Johnston will find this subject admirably treated, from a theologian's point of view, in Mr. Waggett's contribution (chapter xxiv.) to "Darwin and Modern Science."

The question of the antiquity of land-plants is of great interest. Assuming, for the sake of argument, that the highly organised lycopods and fern-like plants described by Prof. Potonié as Upper Silurian ("Die Silur und die Culmflora des Harzes Geb.," *Abhandl. d. k. Preuss. Geolog. Landesanstalt*, Heft 36, 1901) were really of that age, it would appear certain that land-plants must then have already passed through a very long course of evolution. No one is likely, in these days, to suppose that *Bothrodendron* and *Sphenopteridium* were specially created. The doctrine of mutation (of which Mr. Johnston appears to be an adherent) does not materially help in hurrying up the process of evolution, for, as Prof. de Vries himself says, "Mutations do not necessarily produce greater changes than fluctuations" ("Darwin and Modern Science," p. 73).

The problem confronts us, and its solution must simply await further evidence.

D. H. SCOTT.

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The Perseids of 1909.

THE weather, fortunately, took a very favourable turn on August 3, and observations have been obtained nearly every night since, though moonlight has rather seriously interfered with the work and obliterated many small meteors. Up to August 9, and including that date, the display of Perseids was decidedly poor, and quite disappointed expectation. On August 7 and 9, particularly, there appeared to be very few meteors, but the moon was shining rather strongly in the east.

On August 8 there were several brilliant Perseids observed. At 10 p.m. a fine, long-pathed meteor shot from Camelopardalus across κ Draconis towards ζ Ursæ Majoris. At 10.8 p.m. another Perseid, equal in brightness to Jupiter, passed from χ to between β and η Draconis. At 10.34 p.m. a third shot exactly from α Cygni to close to β Cygni. These meteors left streaks, and, in combination with a few other paths recorded on the same night, indicated a radiant at $41^{\circ}+57^{\circ}$.

The shower will probably arrive at its most abundant phase on August 11 or 12 this year, so that the meteors already reported are merely the vanguard of the approaching main group.

W. F. DENNING.

Bristol, August 10.

The Ringing of House-bells without Apparent Cause.

KINDLY allow me space for a few remarks upon Sir Oliver Lodge's theory, put forth in *NATURE* of July 22 (p. 98), to the effect that "the bells get charged with electricity (atmospheric), and are attracted to a neighbouring wall or pipe, and then released suddenly by a spark." Now, while it is conceivable that a bell might be rung under certain conditions in this manner, during the progress of a thunderstorm or display of sheet-lightning, and granting that ordinary non-electric bells have been rung and wires fused when a house has been struck by the electric current during such storms, still, this theory is inadequate to explain those cases of mysterious bell-ringing on record, and for one reason, among others, that these ringings, often violent and prolonged, have been extended over a term of several weeks or months, and have constantly taken place when no storms or strong electrical conditions were apparent, and when every effort was being made to ascertain the cause.

I speak from personal experience of a case which occurred in my house when resident in the south. For a period of two months there were constant ringings—often violent, the bell lashing to and fro—of the indoor bells, without apparent cause. In the case of one bell the wires were cut, but still it rang. The utmost endeavours were made to solve the mystery, but it defied all our efforts. There were no rats, the house having been made rat-proof, nor did we see one rodent during our stay. The wires were carefully traced and examined. Pendulums were affixed to all the bells to detect slight motion, and they were strongly illuminated by a powerful light and a watch

kept, sometimes all through the night. The chief offender among the bells was one communicating with a private room. The wire from this ran, high up near the ceiling, upon the varnished paper, except where it passed through a wall, which it did through a half-inch pipe. It was impossible for a rat or mouse to touch it all along its course. This bell rang repeatedly from early morn to late at night. The room was thoroughly searched and secured—the shutters put up and barred and the door locked. Still the bell rang, and defied all our efforts to elucidate the mystery. On one occasion, when the whole household was together in another room, some little distance away, one of them said, "I wonder if it will ring to-night?" The words were scarcely spoken before the bell rang out, first faintly, then so violently that the bell lashed from side to side. All ran out and saw it swaying. I can state that during the whole period we had no thunderstorm, it being winter, and the ringings were so frequent that it would have needed scores of storms and abnormal electrical conditions to produce them, even if these had been the cause. This theory is ingenious, but one doubts whether Sir Oliver advances it seriously. Whatever is the cause of these mysterious ringings, it is patent to anyone having had experience of them, or knowing the cases on record, that it is not electricity, atmospheric or other.

C. L. TWEEDALE.

Weston Vicarage, Otley, Yorks, August 6.

Variation in Relative Intensity of Helium Lines.

IT has long been an open question whether the spectra of gases were subject to any general law of intensity variation such as the Wien-Paschen displacement law for incandescent solids. Reasoning from Kirchhoff's law, it is frequently assumed that the Wien-Paschen function must be an envelope to the radiation spectrum of any gas, at least for certain selected lines. Pflüger's work with the mercury lamp (*Ann. Ph.*, July, 1908) indicated some such variation in relative intensity, but the energy (temperature) effect was obscured by the effect of varying vapour density. The latter is known to be large, so that the existence of the former was not proven.

We have recently taken up this question, using a pair of helium lamps containing very pure gas at 5 mm. pressure, and found *no variation* whatever when the intensity was varied by a factor of eighteen. The method was to hold one of this pair of lamps constant at a moderate current (5 milliamperes per mm.²), while the intensity of the other was varied from 0.15 to 2.70 times this value. Spectrophotometric settings were made on the brightest red line (λ 668) and the bright blue line λ 447. The uncertainty in the ratios of high/low intensities was less than 2 per cent. in both red and blue; the observed difference in these ratios between red and blue was less than 1 per cent. The red and blue lines then increase in the same proportion over a wide range of intensity.

According to the Wien-Paschen function, an incandescent body should, for an increase in total radiation of 18 fold, increase in temperature 2.06 fold. If this increase is from 1500° to 3090°, then λ 668 would increase in that range 1721 fold, and λ 447 would increase 66,850 fold in intensity, so that the blue increases 38.8 times as much as the red, whereas for helium we found no difference so great as 1 per cent.

P. G. NUTTING.

ORIN TUGMAN.

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Kohlrausch's "Physical Measurements."

I SHOULD like, through the medium of *NATURE*, to direct attention to an erratum in Kohlrausch's "Physical Measurements" (third English edition, Churchill, 1894), p. 434, table 8. The value for $k(s=2.0)$ is given as 0.458, its true value being 0.457(1). Other editions, English or German, not being at hand, I do not know whether the mistake is repeated or not. As this occurs in a very useful table in a universally used reference work, it should be of interest to a number of your readers.

E. W. NELSON.

The Laboratory, Citadel Hill, Plymouth, August 2.