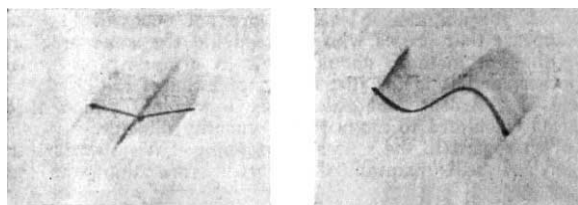


jointly, they generally are not all in one plane of vibration; in other words, one or more appear in a plane which is normal to that of the others, and this can always be secured by a manipulative device. The paths described by any point on the string would in such circumstances be curved figures identical with, or analogous to, the well-known figures of Lissajous.



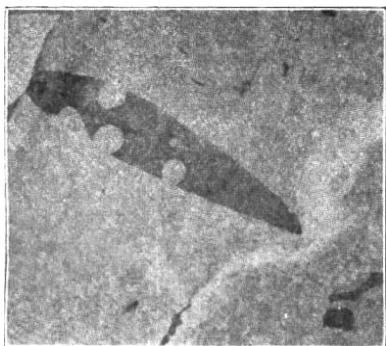
I send two photographs (Figs. 1 and 2), each only 3 cm. by 2 cm., showing a short length of the string with a brilliant point in the middle of it, when executing such oscillations. The curves shown in them are only two out of a large number that I have observed and photographed, and can be recognised to be both compounds of the first three harmonics in the series mentioned above. It is difficult at first mentally to picture the process by which a tuning-fork executing normal oscillations maintains a string permanently in an oscillation of the type shown in the photographs.

C. V. RAMAN.

Post-Box 59, Rangoon.

A Tertiary Leaf-cutting Bee.

ALTHOUGH fossil remains furnish us with abundant evidence of the antiquity of many structural characters in animals, and permit us to surmise a like antiquity of certain habits, it is not often that we find preserved the proofs of the latter. The leaf herewith figured, collected in the Miocene shales of Florissant, Colorado, by two of my students, Messrs. Duce and Rusk, shows the work of a leaf-cutting bee. Evidently the specialised and peculiar habit of cutting out pieces of leaf to use in forming the nest was as highly developed, perhaps, a million years



ago as it is to-day. The bee itself has also been obtained, and described as *Megachile praedicta*, Ckll., 1908.

T. D. A. COCKERELL.

University of Colorado, January.

Tests for Colour-blindness.

WITH reference to the article on colour-blindness in NATURE of January 27, I should like to point out that advocates of the Holmgren test assume that a person who fails with the wools will fail with coloured lights, and that a person who appears normal when examined with the wools is normal when examined with coloured lights. This was the first point which I proposed to settle when I took up the subject of colour-blindness. I found many varieties of colour-blindness, unimportant from a practical point of view, that failed, and many dangerous varieties of colour-blindness that passed this test. Many absolutely normal-sighted persons are also rejected by the Holmgren test; Germany has officially discarded it for this reason.

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Within the last fortnight I have examined two dangerous varieties of colour-blindness that passed the Holmgren test with the greatest ease; in fact, the most punctilious examiner would not have suspected that there was anything wrong with their colour sense, but both made the grossest errors with my lantern. The first case could not tell between the white, green, and red lights on trams at a distance of about one hundred yards.

The two factors which seem to be generally overlooked are the great effect of diminishing the intensity of a light in certain cases and the importance of taking into account the size of the image on the retina, that is to say, the number of cones stimulated. A few days ago I examined a normal-sighted man who had failed with the Holmgren test. He put definite browns with the green skein. When I found that he was normal I asked him to name the wools, and he did so correctly. I then asked him why he put browns with green. He replied, "I have been told I am green-blind, and I thought that there was green in those browns which I could not see." When I told him he was quite normal he had not the least difficulty with the test.

F. W. EDRIDGE-GREEN.

Hendon, January 31.

Observations of Halley's Comet.

READERS of NATURE may perhaps be interested to know that Halley's comet can now be seen with a good pair of field-glasses. Careful estimates make it almost exactly equal to an eighth-magnitude star.

The best form of instrument is a high-power Galilean binocular, and though the comet does not present any interesting features with such small optical aid, it can be distinctly seen, and distinguished from a star by its nebulous appearance. It is, of course, necessary to know the comet's position fairly exactly before attempting to pick it up. The following are a few of my notes:—

- 1910, Jan. 8, 12 and 13, Comet faintly seen in 1-inch finder
Mag. ± 9.0 .
" " 15d. 8h. 45m. Faintly seen in binocular.
" " 30d. 8h. om. Steadily seen in binocular.
" Feb. 3d. 8h. om. Found with binocular, eighth magnitude (estimate 8.1).

P. M. RYVES.

Zaragoza, Spain, February 5.

Records of the Earthquake of January 22.

DR. CHREE has noted in NATURE of February 3 the mechanical effect upon the Kew declination-magnetograph by the earthquake of January 22. Any confirmation of movements of this kind is of considerable value, and I therefore send you this notice of the corresponding effects upon the Stonyhurst magnetographs. All the three elements were markedly affected; the declination magnet was set in oscillation at 8h. 56m. a.m. for five minutes, the vertical force magnet also at 8.56 for about two minutes, and the horizontal force magnet was the most disturbed, commencing at 8.52 and lasting for quite ten minutes, with a maximum displacement of 3.5 mm. against the force of the torsion balance, but it is not clear that there was any swing on the opposite side of the normal position.

The origin of the earthquake remains apparently unknown, but, judging by our Milne seismograph, it was much nearer to us than any of the thirty earthquakes registered here since the instrument was fairly started on active service on July 1, and the proximity may account for the much greater swing of the boom. From the beginning I have claimed the eastern border of the Atlantic for the true region.

Prof. Milne's seismographs at Shide have shown an enduring displacement which has not been produced here.

WALTER SIDGREAVES.

Stonyhurst College Observatory, February 5.

The Mendel Journal.

IN NATURE for December 30, 1909 (p. 252), there appeared a review of the first number of the *Mendel Journal*, by "E. H. J. S." He also, in the same review, reviewed the current issue of *Biometrika*. I pass no comment upon the questionable fairness of having two