minous envelope of the sun were then considered; and an attempt was made to show that the shining particles in that envelope may possibly be minute luminiferous organisms, floating in an elastic atmosphere, each emitting only a small amount of phosphorescence,—the enormous flood of splendour emanating from the surface of the medium being due to the combined action of these individually feeble agents.

The following Gentlemen were duly elected Ordinary Fellows :—

HON. LORD NEAVES.
Dr PENNY, Glasgow.

Monday, 18th February 1856.

RIGHT REV. BISHOP TERROT, V.P., in the Chair.

The following Communications were read :—

1. On certain cases of Binocular Vision. By Professor William B. Rogers. Communicated by Professor Kelland.

The object of this paper was to ascertain, by a geometrical construction, the optical appearance presented by the binocular vision of a straight line and a circle, or of two straight lines. The problem discussed was, accordingly, the geometric one of the intersection of a cone with a plane, or of two cones with each other: and the conclusion arrived at was that the apparent image is always a conic section. The author took no account of the *perspective* of the presented combination of images, nor of the union or disunion of the extremities of the respective images when their lengths are different. Nor did he allude to the mode by which the mind arrives at connected conclusions, from separate examination by the eye, whether by retention of images on the retina, or by the action of the memory, or otherwise. In anticipation of the introduction of such subjects, which the author has discussed in three papers, printed in Silliman's Journal of last year, Sir D. Brewster addressed the following letter to Prof. Kelland, which puts some of these questions in a striking point of view, and is of considerable interest :—

“ MY DEAR MR KELLAND,—I observe that Professor Rogers is to

read a paper on *Binocular Vision* at the Royal Society on Monday. As he has published his experiments and views on this subject in *three* articles in Silliman's Journal for *July, October, and November, 1855*, I presume that the paper he is about to read will contain the same views. I regret that I cannot be at the meeting on Monday to defend my theory of the Stereoscope against his objections to it; which are founded on an inaccurate perception of the phenomena, and stand in direct opposition to the *Law of Visible Direction*, which I have placed beyond a doubt, and which, I believe, is universally admitted.

"Mr Rogers maintains that *two lines* of unequal length, AB, *ab*, for example, *ab* being the shortest, can be made to coalesce perfectly, i.e., that when the points A *a* are united by distinct vision, B and *b* are also united. Now, when the optical axes are converged, on A *a* united and seen *distinctly*, B and *b*, the other ends of the lines, are seen *indistinctly*, and, therefore, the observer cannot *see* them united, unless by running the point of distinct vision from A to B, when he will see them united. But when he is thus seeing these points B and *b* united, A and *a* have separated till the eye returns and unites them as before. This is the true process which goes on, and the *apparent* union of the lines thus effected is aided by two causes which Mr Rogers does not seem to have noticed. The eye runs from A to B and back again in less than one-third of a second (the duration of the impression of light upon the retina), so that the impression of A and *a* united *remains* when the eye is actually seeing B and *b* united. The other cause is merely an auxiliary one, and is not necessary to the *apparent* union of the line. It is the mental recollection of the union of A and *a* when the eye has passed in an instant to join B *b*. I lay no stress, however, upon this fact, as it is only a *physical* one, on the supposition that a recollected impression is the result of a visual sensation.

"If two unequal lines can be united and perfectly coalesce, then *two separate visible points* would have their pictures on the retina coincident; or, what is the same thing, a *line* joining two points, *a* and *b*, would have a *single point* for its image on the retina; and, what is still more absurd, *two different points* of the retina would have the same line of visible direction!

"When the difference between the two lines AB and *ab* exceeds a certain quantity, the apparent coalescence, produced by the causes

I have mentioned, entirely disappears, and it is then easy to convince one's self that the ends B and *b* are not only extremely indistinct, but completely separated when the optic axes are converged upon A and *a* united and seen distinctly.

“ You will oblige me by reading these few and hurried observations to the Society. I differ with Mr Rogers on many other points to which I shall have occasion to refer in a treatise *on the Stereoscope* which will soon be published. I am, &c.

“ D. BREWSTER.

[“ ST LEONARD'S COLLEGE, ST ANDREWS,
February 16, 1856.”

2. Theory of the Free Vibration of a Linear Series of Elastic Bodies. Part I. By Edward Sang, Esq.

Some remarkable Specimens of Photography were exhibited.

The following Gentleman was elected an Ordinary Fellow :—

Dr LAYCOCK, Professor of the Practice of Medicine.

The following Gentleman was elected an Honorary Fellow :—

HENRY D. ROGERS, Esq., State Geologist of Pennsylvania, U.S.

Monday, 3d March 1856.

Dr CHRISTISON, Vice-President, in the Chair.

The following Communications were read :—

1. Observations on the Diatomaceous Sand of Glenshira. Part II. Containing an Account of a number of additional undescribed Species. By William Gregory, M.D., F.R.S.E., Professor of Chemistry in the University of Edinburgh.

The author, after referring to his former paper on this subject, stated that he had continued the investigation, and that the number of undescribed forms besides those formerly figured had proved so large, that the present paper does not conclude the subject, but that