dition, and that a crowding of such luminous matter involves an increase of luminosity, may we not infer with a high degree of probability that the striæ are themselves aggregations of matter, and that the dark spaces between them are comparatively vacuous.

It is true that such a view of the case would seem to imply that, in gaseous media, the better the vacuum the more easily can the electricity pass; and that this might at first sight appear to be at variance with the known fact that the resistance of a tube decreases with the pressure until a minimum, determinate for each kind of gas, and then increases. But it has been suggested by Edlund (*Annales de Chemie et de Physique*, 1881, tom. iii. p. 199) that the resistance of a tube may really consist of two parts, first, that due to the passage of the electricity through the gas itself, and, secondly, that due to its passage from the terminals to the gas; and also that the former decreases, while the latter increases, as the pressure is lowered. On this supposition, the observed phenomena may be explained, without assigning any limit to the facility with which electricity may traverse the most vacuous space.

We may even carry the suggestion of a resistance of the second kind a little further, and suppose that there is a resistance due to the passage of electricity from a medium of one density to that of another, or from layer to layer of different degrees of pressure. And from this point of view, we may regard the striæ as expressions of resistance due to the varying pressure in different parts of the tube. Into the question, whence this variation of pressure, I am not at present prepared to enter; it must suffice for this evening, to have shown that the conclusions which we have drawn from our experiments, are not in discordance with other known phenomena of the electrical discharge.

The warning hand of time bids me not to prolong my discussion of the subject. But before closing, I would point out that these laboratory experiments are not unsuggestive in reference to larger questions. It has long been, and still is, a disputed question whether a display of the aurora borealis ever takes place at any considerable elevation above the earth's surface. On the one hand, observations are cited giving a not unfrequent elevation of nearly 200 miles; while on the other, experiments with vacuum tubes appear to limit the range to less than forty miles. The observation is perhaps a doubtful one at best; it is not easy to fix the position of so faint and flickering a phenomenon, and it is perhaps even more difficult to identify a particular phase of it when seen from two distant positions. But the recorded data are still entitled to some consideration, especially if it has been shown that the evidence furnished by vacuum tubes is not conclusive against the higher estimate.

It would be very pleasant, if, wafted by the breezes of scientific imagination, we were to set full sail, and navigate our bark into still more distant space. And, indeed, we are under no slight obligations to those strong minds and courageous spirits who thus adventure themselves out beyond well-known waters; for the treasures which they bring back from every such voyage are both valuable and strange, and they set men thinking on new and untrodden lines. But lest, less fortunate than my neighbours in any such venture, I should fail to fall in with a returning current, capable of recovering my expended energy, and of restoring myself to *terra firma*, I must here pause. It is, however, said, that in the mind of every one, even the most philosophic, there is a tender part; and therefore I must ask your indulgence, if, while resolutely turning my back on physical speculations, I still return for a moment to my first love, mathematical contemplation. For, in the region which we have been considering, namely, the magnetic field, explored and represented by its electric action, we seem to have entered upon a world which Riemann might have longed to see, a world wherein Lobatcheffski and Beltrami might have enjoyed the full fruition of realised ideas, and where even Clifford might have found abundant scope for the exercise of his inexhaustible powers of imagination and of thought.

FLORA OF NEW SOUTH WALES IN ITS GEOLOGICAL ASPECT

THIS, the oldest of the Australian settlements, may have its area grouped as follows:—(1) That of the sandstones or poor country represented by the Proteads and Epacrids; (2) the eastern slopes of coast range represented by the tree-nettles and the palms; (3) the cold mountain shrubsure represented by sassafras, tree ferns, and myrtles; and (4) the interior plains represented by Chenopods and Compositæ. It may be wondered how the distribution of the vegetation has originated. That the Australian continent has risen slowly, is gathered from numerous proofs, among others the very apparent one of the strata exhibiting preponderately a horizontal plane. It may further be inferred that in its uplifting, the outer rim of the continent was slightly more elevated than the interior. This taken into consideration along with what doubtless at one time existed, namely, a great inland sea, abundance of marshes and mud, and a once probable greater rainfall, and particularly the latter, though one and all may have contributed to the present physical features, and consequently plant life. Another interrogatory arises, viz. Whence the coal-seams? As to these, there is some likelihood they are the remains of vegetation borne hence from a now sunken continent eastward of Australia; New Zealand, Norfolk, and Howes Island being outliers or now mere island vestiges of the said great land area in the Pacific Ocean.

Of the four local divisions above enumerated, the most typical vegetation of the first is the group Proteaceæ, a very ancient family, extending back to the secondary period of geology, from which time Australia apparently has never been submerged. A point of very considerable importance as bearing on this long-continued stability of the Australian continent may be derived from the remarkable close relationship and insensible gradation of some plants; for instance there is great difficulty in separating species of Eucalypti, Banksias, &c. Thus it may be said none or few of the connecting links have been lost, as must necessarily have been the case had submergence and elevation of the land have occurred.

Many curious problems yet await investigation, such as the fertilisation of the Proteads, including the Styleworts and Goodenia family. Again, have the Epacrids once been a family of trees, wherefrom the living species are but decadent examples? The Casuarineæ, or Beefwod tribe, are undoubtedly an ancient group, and like conifers, flourished in the dawn of life. The second division of the eastern slopes, Palms, and Tree-nettles possibly may have had an Asiatic origin, through the Malayan Archipelago. They appear not to be truly Australian in origin, but themselves only long established colonists. On the contrary, among the third division of the cold mountain scrubs, the Dorophoræ (Sassafras) hold a conspicuous place, and evidently are of Australian derivation. The peculiar vegetation of the interior plains or fourth division, the Chenopods and the Compositæ, are rapidly becoming one of the past, and the small species even now are sensibly giving place to the introduced grasses and weeds. Apart from the groups mentioned as most typical of the four areal divisions in question, as regards the Acacias and Eucalypts, they have the widest distribution and complicated genera. They both appear to be genera at their zenith, having existed long enough to pass into redundant forms, but not long enough to have been exposed to vicissitudes and decline. Their absence from Howe's Island and New Zealand shows they in all likelihood did not belong to the hypothetical submerged continent, nor are they old enough to be found along with the laurel and other remains of the gold drift. (Abstract of a communication by Mr. Robert Fitzgerald, F.L.S., read at the meeting of the Linnean Society, February 2, 1882.)

UNIVERSITY AND EDUCATIONAL INTELLIGENCE

CAMBRIDGE.—The recent report of the Council of the Senate relative to the proposed Professorship of Animal Morphology, is creditable both to the University and to the Council. We think it desirable to quote some of its paragraphs entire. "The successful and rapid development of biological teaching in Cambridge, so honourable to the reputation of the University, has been formally brought to the notice of the Council. It appears that the classes are now so large that the accommodation provided but a few years ago has already become insufficient, and that plans for extending it are now occupying the attention of the Museums and Lecture-Rooms Syndicate.

"It is well known that one branch of this teaching, viz., that of Animal Morphology, has been created in Cambridge by the efforts of Mr. F. M. Balfour, and that it has grown to its present importance through his ability as a teacher and his scientific reputation.

"The service to the interests of natural science thus rendered