the influence of ice sheets on the geographical distribution of plants. Prof. Thomas Meehan, the father of the latter, in a "Catalogue of Plants collected in July, 1883, during an Excursion along the Pacific Coast in South-eastern Alaska,"[1] had given reasons for believing that plants did not merely advance in the wake of retreating glaciers, or push into growth from material brought down in their advance, but that when caught under the mass of flowing ice, would remain for an indefinite period, retaining vitality, and push again into growth when the ice retreated. Prof. Meehan was led to this conclusion from finding no annual plants among those collected in the immediate wake of retreating glaciers in Alaska, while the actual number of species of perennials collected in such locations would be as great as if much time had been given for a floral advance. He had but little opportunity for actual observation as to the plants brought down with the earth carried on the ice, but so far as this went only *Epilobium latifolium* and *Dryas octopetela* were found in this condition, and scarcely any plants were observed on recently deposited moraines. These and some other facts led to the hypothesis that the plants were not migratory, but had held their position through the whole icy period.

These facts were supported by the determination of the existence of much the same flora in isolated spots of land recently bared by the névé of the inland ice, as grow away from the margins of the ice sheet, while the finding of living willow trunks, grass, and perennial plants of many years' growth close to the edges of retreating glaciers, seem to place the point beyond any reasonable doubt, especially when, after careful survey, through the construction and positions of the glaciers, there was the absolute certainty that the plants could not have been deposited by lateral, medial, or terminal moraines, though they might have been by ground moraines—a circumstance which would settle Prof. Meehan's position affirmatively beyond dispute, since the ground moraines are borne under the flowing ice rivers. Abundant vegetation was also found in nunataks—peaks of land projecting above the glaciers or ice cap—but little significance was placed on this circumstance, since all such nunataks visited were within a reasonably close proximity to the main land masses, and the vegetation might readily have sprung from seeds blown there by the winds or brought by mud on the feet of birds. But the demonstration of aged living plants in the other situations named must have a strong bearing on the discussions involved as to the influence of the ice age on the distribution of plants over the surface of the earth.

The abundance of lichens is characteristic of the flora of Greenland. Rocks supposed from a distance to be naturally coloured are found on closer inspection to derive their hue from a complete investiture of some lichen. In this particular the crimson cliffs, beginning at Cape York and extending many miles northward, are a conspicuous example. These cliffs, rising sheer from the water's edge to heights of from seventeen hundred to two thousand feet or more, though of grey granite, show no spot of the intrinsic colour even on being nearly approached, but present a uniform red appearance over their whole surface from a large orange red lichen which covers them.

In view of Schwendener's theory that lichens are but symbiotic forms of algæ and fungi, it is to be regretted that the probably rich fields afforded by the latter named great families in this region have yet to be investigated.

Mosses are even more abundant than lichens. They grow in such vast quantities in spots, that their light or dark greens are visible often for some miles away, brightening the otherwise bleak shores wonderfully. Their persistence in growth under apparently adverse circumstances is also remarkable. No obstacle save the sea seems sufficient to stop their progress. Even dead glaciers have been and are being buried under the steady march of these cryptogamous plants. Mosses fulfil the same duty in Greenland that other forms of plant life perform in more favoured climes, and the amount of rich vegetable matter being deposited by them may be of great value in the future of that great arctic island.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

THE Rev. Bartholomew Price, Master of Pembroke College, has been added to the electors to the Savillian Chair of Astronomy on the present occasion.

SIR HENRY HOWORTH, F.R.S., has had the honorary degree of D.C.L. conferred upon him by Durham University.

OXFORD has conferred the degree of M.A. upon Dr. W. B. Benham, Aldrichian Demonstrator.

MR. W. FISHER, late Conservator of Forests in the North-West Provinces of India, has been appointed Assistant Professor of Forestry at Cooper's Hill.

SCIENTIFIC SERIALS.

American Journal of Science, June.—Electro-chemical effects due to magnetisation, by George Owen Squier.—Nikitin on the quaternary deposits of Russia and their relations to prehistoric man, by A. A. Wright. A summary of the views laid before the International Congress of Archæology in Moscow, 1892, by the Russian geologist, Mr. S. Nikitin, regarding the palæolithic and neolithic epochs in European Russia, and their coincidence with the geological divisions of pleistocene and modern.—Rigidity not to be relied upon in estimating the earth's age, by Osmond Fisher. A criticism of Mr. Clarence King's estimate of the probable age of the earth on the ground of its assumed rigidity not being an established fact. The argument derived from tidal action is fully discussed. Had the solid part of the earth so little rigidity as to allow it to yield in its own figure very nearly as much as if it were fluid, there would be very nearly nothing of what we call tides—that is to say, rise and fall of the sea relatively to the land—but sea and land together would rise or fall a few feet every twelve lunar hours. This would be the case if the geological hypothesis of a thin crust were true. This is the argument for tidal rigidity as enunciated by Kelvin. But this does not take into account the horizontal motion of the water. It rests upon the equilibrium theory of tides as against the canal theory. The latter has been symbolically worked out by Prof. G. H. Darwin. If the earth's interior be assumed to be a liquid of small viscosity, the bodily tide at its equilibrium value will have a height of $1\frac{3}{4}$ feet. This will diminish the hydrodynamical tide by not more than a fifth of its value, and it is quite possible that the tides we actually experience may be tides thus diminished by the fluidity of the earth's interior.—On the treatment of barium sulphate in analysis, by J. I. Phinney. The author shows that alkaline chlorides contaminate barium sulphate thrown down in the presence of an excess of sulphuric acid, and that the process of purifying by hydrochloric acid is inefficient. The only good method for purification is either to fuse, according to Fresenius, with sodium carbonate, extracting and reprecipitating as sulphate, or to evaporate from solution in concentrated sulphuric acid according to Mar.—On the nature of certain solutions and on a new means of investigating them, by M. Carey Lea. The solutions in question are those of sulphates which were tested for free sulphuric acid by a solution of iodoquinia, a very delicate and trustworthy test. Solutions of heavy metallic sulphates, with the exception of ferrous sulphate, contain no free acid. All sesquisulphates examined were dissociated in solution. So were acid salts and alums, with the exception of chrome alum.—Also papers by Messrs. Fairbanks, Moses, Penfield, Johnson, and Pupin.

Bulletin of the New York Mathematical Society, vol. ii. No. 8 [May, 1893, New York]. This number opens (pp. 175–178), with a review by Miss C. A. Scott of Prof. W. B. Smith's "Introductory Modern Geometry of Point, Ray, and Circle" (see NATURE, vol. xlvii. p. 532). We endorse her closing remarks that the usefulness of the book would be greatly increased if he were to translate his work into ordinary mathematical English.—Prof. Echols contributes an interesting note, biographical and otherwise, entitled Wronski's expansion (pp. 178–184). The expansion was presented by Höené Wronski in 1810, to the French Academy of Sciences, and is as follows:—$f(x)=a_0+a_1\omega_1+a_2\omega_2+\ldots$ *ad infinitum*, where $f(x)$, ω_1, ω_2,...are arbitrary functions of x, and a_0, a_1,...are independent of x. The law of formation of the coefficients he calls "la loi suprême."—Dr. Cole, in a note on the substitution groups of 6, 7, and 8 letters (pp. 184–190), furnishes a list of over forty omitted groups supplementary to the lists given by Messrs. Askwith and Cayley in vol. xxiv. of the *Quarterly Journal of Mathematics*.—The *Mathematical Bibliography*, by A. Ziwet (pp. 190–192) gives in some detail an account of the new *Revue Semestrielle des Publications Mathématiques*, &c., issued by the Mathematical Society of

[1] Proceedings of the Academy of Natural Sciences of Philadelphia, 1884.