place of one which was originally granted by the Highland Society. Teachers of agricultural science have alleged that the regulations in connection with the national diploma are unsatisfactory, but notwithstanding the attempts of the Agricultural Education Association to secure their improvement, the joint board seems unwilling to alter the conditions of awarding diplomas. Prof. Wallace, of Edinburgh University, enumerates some of the disadvantages attached to the present state of affairs in a recent pamphlet, and among them he mentions that Scottish students have to travel twice to Leeds to be examined by a board from which teachers of agriculture are practically excluded, that the present scheme encourages cramming, and that it is national only in name. Prof. Wallace has obtained the opinion of the Solicitor-General of Scotland as to the position of the Highland Society in relation to its Charter on Education, 1856. This Charter empowers and requires the council of the Highland Society to appoint a board of examiners and to grant diplomas, and the opinion of counsel is that by its action in 1899 in agreeing to the joint board, the council of the Society is not acting in conformity with the provisions of its Charter. Prof. Wallace is, it appears, entitled to take steps to compel the council to proceed in accordance with the Charter.

THE following announcements of gifts to higher education in the United States have appeared in *Science* since the beginning of December, 1902 :—Mr. James Stillman, 20,000*l.* to Harvard University for the endowment of a professorship in comparative anatomy. Mr. Peabody has offered to the University of Georgia a 10,000*l.* building, provided the Legislature will appropriate to the University for maintenance the sum of 2000*l.* a year for two years, and make improvements costing 240*l.* A bequest of 16,000*l.* was made to Yale University by the will of Mr. Benjamin Barge. Mr. Morris Jesup, 2000*l.* to Princeton University. Mr. John D. Rockefeller, 200,000*l.* to the University of Chicago, to be added to the endowment, and other sums amounting to 105,200*l.* have been given to the same university. Tulane University has been made the residuary legatee of the late Mr. A. C. Hutchinson, and it is expected that it will receive 200,000*l.* The University of Rochester has received 2000*l.* from Mrs. Steele. Yale University will ultimately receive 10,000*l.* for the aid of poor students by the will of the late Mrs. Courrier. Dr. D. K. Pearsons has given to Illinois College, Jacksonville, 10,000*l.*; to Fargo College, Fargo, N. D., 10,000*l.*; to West Virginia Conference Seminary, Buchanan, 10,000*l.*; to Pomona College, at Claremont, 10,000*l.*; and to Fairmount College, Wichita, Kas., 5000*l.* This makes the total of Mr. Pearsons's contributions to colleges 800,000*l.* Mr. Henry Phipps, 60,000*l.* for the establishment in Philadelphia of "The Henry Phipps Institute for the Study, Treatment and Prevention of Tuberculosis." Cornell College, Iowa, has added 14,300*l.* to its endowment funds. A friend whose name is not yet made public gave 10,000*l.* Mr. Fred W. Brown has given 2000*l.* Harvard University received 10,000*l.* by the will of Rebecca C. Ames, the income to be used for the support of poor students. The University of Pennsylvania received gifts during the year to the value of 187,370*l.* Mr. Robert E. Woodward, 10,000*l.* to the Brooklyn Institute of Arts and Sciences. The Duke de Loubat, 20,000*l.* to Columbia University for the establishment of a chair of American archæology. Oberlin College has received an anonymous gift of 10,000*l.* from the same donor who recently gave 10,000*l.* By the will of the late Prof. Waterhouse, Washington University received 5000*l.*, and Harvard University and Dartmouth College each 1000*l.* Mr. S. M. Inman, 5000*l.* toward the proposed Presbyterian university to be erected in Atlanta, Ga. Cornell University has received an anonymous gift of 30,000*l.* for the establishment of a pension fund. Mr. James B. Colgate, 20,000*l.* to Colgate University, Hamilton, N.Y., to which he had already given more than 200,000*l.* Mr. Andrew Carnegie, 20,000*l.* to Western Reserve University for the establishment of a school for the training of librarians. Columbia University received 2000*l.* for the establishment of a scholarship by the will of Mrs. Banker. It thus appears that in three months universities and colleges of the United States have, owing to the liberality of American citizens, benefited to the extent of more than one and a quarter millions sterling.

SCIENTIFIC SERIAL.

Journal of Botany, March.—Under Limonium Mr. E. S. Salmon discusses the varieties and synonyms which Hooker, in his "Student's Flora," places together under *Statice auriculaefolia.*—The fresh-water algæ reviewed by Messrs. W. West and G. S. West are mostly small Chlorophyceæ, and include five new species and a new genus, Polychætophora.—The notes on Myricaceæ contributed by Dr. Rendle were prompted by a rearrangement of the British Museum plants consequent upon Chevalier's recent revision of the group, whereby certain forms are separated from Myrica to form the new genera Gale and Comptonia.—The diagnoses presented by Mr. Spencer Moore refer to new sympetalous plants collected in the Coolgardie district of W. Australia.—The following short articles occur :—" Rubi of the Neighbourhood of London," by Rev. W. M. Rogers; "*Lepidium Smithii,*" var., by Mr. F. Townsend; "Possible Use of Essential Oils in Plant Life," by Dr. G. Henderson.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, March 5.—"The Differential Invariants of a Surface, and their Geometric Significance." By Prof. **Forsyth,** F.R.S.

The present memoir is devoted to the consideration of the differential invariants of a surface; and these are defined as the functions of the fundamental magnitudes of the surface and of quantities connected with curves upon the surface which remain unchanged in value through all changes of the variables of position on it. They belong to the general class of Lie's differential invariants; and some sections of them were obtained about ten years ago by Prof. Zorawski, who, for this purpose, developed a method originally outlined by Lie. Earlier, they had formed the subject of investigations by a number of geometers, among whom Beltrami and Darboux should be mentioned.

Prof. Zorawski's method is used in this memoir. In applying it, a considerable simplification proves to be possible; for it appears that at a certain stage in the solution of the partial differential equations characteristic of the invariance, the equations which then remain unsolved can be transformed so that they become the partial differential equations of the system of concomitants of a set of simultaneous binary forms. The known results of the latter theory can then be used to complete the solution.

The memoir consists of two parts. In the first part, the algebraic expressions of the invariants up to a certain order are explicitly obtained; in the second, their geometric significance is investigated.

An invariant, which involves the fundamental quantities of a surface E, F, G, L, M, N (these determine the surface save as to position and orientation in space) and their derivatives up to order n, as well as the derivatives of functions ϕ, ψ, of position on the surface up to order $n+1$, may itself be said to be of order n. The invariants up to the second order inclusive are obtained. It appears that, if two functions ϕ and ψ occur, all the invariants that occur up to the second order can be expressed algebraically in terms of 29 algebraically independent invariants; while, if only a single function ϕ occurs, all the invariants that occur up to the second order can be expressed in terms of 20 algebraically independent invariants.

The significance of these respective aggregates of 29 and of 20 invariants is obtained in connection with curves

$$\phi = 0, \ \psi = 0,$$

drawn upon the surface. The investigation reveals new relations among the intrinsic geometric properties of a curve upon a surface. In particular, up to the second order, four such relations exist for a single curve, and their explicit expressions have been constructed.

March 12.—"On the Histology of *Uredo dispersa,* Erikss., and the 'Mycoplasm' Hypothesis." By Prof. H. Marshall **Ward,** F.R.S.

The paper deals with a detailed study of the histological