ford Long, of Georgia, who first used sulphuric ether to produce unconsciousness in surgical operations in 1842, four years before its use at the Massachusetts General Hospital.

In conclusion, if in our rôle as critic and reviewer we have said anything to make the reader think ill of Dr. Packard's book, we desire now to take it all back and to assure him that it is a most interesting and valuable contribution to American history and literature.

E. F. C.

SCIENTIFIC JOURNALS AND ARTICLES.

THE *Botanical Gazette* for October contains the following papers: F. L. Stevens publishes the third and last part of his paper entitled, 'Gametogenesis and Fertilization in *Albugo*.' A multiple fertilization was unknown before its discovery by the author in *Albugo Bliti*, the only species of *Albugo* previously investigated exhibiting simple fertilization. The present paper includes *A. Portulacæ*, *A. Tragopogonis* and a reinvestigation of *A. candida*, and shows that these species, together with *A. Bliti*, form a series differing in the prominence of the 'receptive papilla,' the development of the cœnocentrum, and in the functional egg nuclei. The conclusion is reached that the primitive forms were multinucleate, and that the uninucleate condition is a derived one. It its ontogeny *A. Tragopogonis* indicates this, its oosphere in early stages being multinucleate, and later becoming uninucleate by degeneration of supernumerary nuclei. The cœnocentrum, an organ of hitherto unknown function, is shown to serve in the nutrition of the surviving female nucleus. Many conditions are noted which tend to confirm Strasburger's theory regarding kinoplasm and its relation to sexual differentiation.

W. L. Bray completes his paper on 'The Ecological Relations of the Vegetation of Western Texas.' It is a general discussion and analysis of this interesting field, and is designed primarily to form the basis of a detailed botanical survey of the State. The author considers at some length the relation of the vegetation to the climatic factors of temperature, moisture, winds and sunlight; and to the so-called edaphic factors of physiography, soil structure and other geological phenomena. The greater part of the paper, however, is given to a discussion of the plant formations of the region under the following general heads: (1) Grass formations; (2) woody formations, including numerous types of arborescent and chaparral formations; (3) water storage formations; (4) formations of cryptogamous xerophytes; and (5) halophytic plants. The following propositions summarize the main features of the discussion: (1) The climatic conditions conspire to make the west Texas region a typical 'grass plains country'; (2) in its temperature relations the vegetation ranges from the tropical to the transition zones; (3) the region is marked by several climatic types which are enumerated; (4) the original formations are undergoing profound changes due to human agencies, the tendency being to break up the grass formations and to permit the encroachment of woody vegetation; but areas of arborescent vegetation are being denuded of valuable timber, thus forcing the question of water supply and control of floods.

Mr. James B. Dandeno points out the confused usage of physiologists in designating the solutions with which they have worked. The term 'normal solution' has been used by some for solutions containing a gram equivalent per liter of solution, by others for those containing a gram equivalent per liter of water, and by still others for gram molecule per liter solution. After defining these three carefully and calling attention to the usage of chemists, he cites examples of confused usage by physiologists, and urges that care be taken to distinguish between different sorts of solutions and to avoid misuse of the term 'normal.'

Mr. Burton E. Livingston adds to his previous contribution on the same subject an account of several lines of experimentation, which extend his previous results and confirm his conclusions already expressed. In the new experiments upon *Stigeoclonium tenue* he has used solutions of non-electrolytes (in this case sugars), and also solutions containing both sugar and mineral salts; further, he has cultivated these plants on porous plates, in gelatin, in darkness, and under conditions where evaporation would concentrate solutions. He finds in all cases that osmotic pressure is the deter-

mining factor for the form of the plant, whether the cells are immersed in solution or supported upon gelatin or upon porous plates; and as darkness has no effect upon the form of this plant, its polymorphism does not depend upon photosynthesis. His physiological experiments have been supplemented by a considerable series of physico-chemical tests in order to determine whether error had been introduced into his experiments by assumption that complete ionization occurred in his solutions of electrolytes. He finds that the osmotic pressure calculated by the freezing point method, and in some cases also by the boiling point method, conforms so closely to the osmotic pressure calculated on the assumption of complete ionization, that no error had been introduced, the differences between the calculated and determined pressures lying entirely within the range of the pressure limits found for the several responses of the plant.

T. C. Johnston publishes some results in connection with intramolecular respiration, and Dr. J. Schneck records some interesting observations on *Aquilegia Canadensis* and *A. vulgaris*.

SOCIETIES AND ACADEMIES.

AMERICAN MATHEMATICAL SOCIETY.

A REGULAR meeting of American Mathematical Society was held at Columbia University on Saturday, October 26, extending through the usual morning and afternoon sessions. The first part of the afternoon session was devoted to a joint meeting with the American Physical Society at which a paper 'On the Theory of Elastic Plates' was read by Professor J. Hadamard, the representative of the University of Paris at the recent Yale Bicentennial. About forty persons were present at the joint session, which was presided over by President Michelson, of the Physical Society. At the separate session of the Mathematical Society, at which Vice-President Thomas S. Fiske occupied the chair, thirty-three members of the Society were in attendance. Twelve persons were elected to membership: Mr. C. H. Ashton, Harvard University; Professor H. Y. Benedict, University of Texas; Dr. William Findlay, Columbia University; Dr. W. B. Fite, Cornell University; Professor G. W. Greenwood, McKendree College; Professor F. W. Hanawalt, Iowa Wesleyan University; Dr. E. V. Huntington, Harvard University; Professor H. W. Kuhn, Ohio State University; Dr. I. E. Rabinovitch, New York City; Professor W. D. Tallman, Montana State Agricultural College; Mr. H. M. Tory, McGill University; Mr. A. H. Wilson, Princeton University. Seven applications for membership were received. The By-laws of the Society were amended to provide that the presidential address shall hereafter be delivered at the last meeting of the presidential term. As the amendment takes effect at once, President Moore's address will be postponed to the annual meeting of December, 1902.

The following papers were presented at this meeting:

PROFESSOR G. A. MILLER: 'On the abelian groups which are conformal with non-abelian groups.'

DR. H. F. STECKER: 'Concerning the elliptic $\wp(g_2; g_3; z)$-functions as coordinates in a line complex, and certain related theorems.'

MISS I. M. SCHOTTENFELS: 'Generational definition of certain groups of order 960.'

PROFESSOR OTTO STOLZ: 'Zur Erklärung der Bogenlänge und des Inhaltes einer krümmen Fläche.'

DR. L. P. EISENHART: 'Conjugate rectilinear congruences.'

PROFESSOR S. E. SLOCUM: 'The symbols of the infinitesimal transformations which generate the parameter groups corresponding to all possible types of structure of two-, three- and four-parameter complex groups.'

DR. E. V. HUNTINGTON and DR. J. K. WHITTEMORE: 'Some curious properties of conics touching the line infinity at one of the circular points.'

PROFESSOR J. HADAMARD: 'On the theory of elastic plates.'

PROFESSOR E. B. VAN VLECK: 'On the zeros of fundamental integrals of regular linear differential equations of the second order, with a determination of the number of imaginary roots of the hypergeometric series.'

DR. E. J. WILCZYNSKI: 'Reciprocal systems of linear differential equations.'

DR. I. E. RABINOVITCH: 'On some contradictions involved in the elliptic geometry in a point space.'

DR. EDWARD KASNER: 'Determination of the integrals in the calculus of variations leading to an assigned system of extremals.'

The members of the two societies lunched together at the University restaurant, and in