of root hairs.—J. W. T. Duvel records the germination of seeds buried in soil at least three and a half years, the seedlings obtained being 128 in number and representing seven genera and nine species.—Conway MacMillan describes cumaphytism in *Alaria*, showing how strongly the *Alaria*-type of body may become modified by existence in the surf.

SOCIETIES AND ACADEMIES.

PHILOSOPHICAL SOCIETY OF WASHINGTON.

The 579th meeting was held January 30, 1904.

Mr. O. H. Tittmann, superintendent of the Coast and Geodetic Survey, gave a brief account of the meeting of the International Geodetic Association during the past summer, at Copenhagen. The most important questions considered during the nine days' meeting were longitude, gravity on land and sea, and variation of latitude.

Mr. L. A. Fischer, of the Bureau of Standards, read a paper on 'The International Bureau of Weights and Measures,' which was established in accordance with an agreement signed by seventeen of the principal nations of the world, including the United States, at Paris, in 1875. A description was given of the laboratory and other buildings, situated on neutral territory in the Park of St. Cloud, at Sèvres, near Paris. An account of the principal work of the bureau was given. This included the comparison of the various national prototypes of the kilogram and meter with one another and with the international kilogram and meter, at present deposited in an underground vault at the International Bureau. The investigation of nickel-steel alloys, the determination of the volume of the kilogram of water, and the establishment of the present standard hydrogen temperature scale were also mentioned. The paper closed with a brief account of the recent comparison of the U. S. Prototype Meter No. 27 with the two standards of the International Bureau. Only preliminary results of this comparison were given, the final results being deferred until further comparisons have been made between No. 27 and the two other copies of the International Meter in possession of the Bureau of Standards.

Mr. James Page, of the Hydrographic Office, then presented the modern view of 'ocean currents.'

Two independent circulations are involved in the movement of the waters of the sea: (1) The vertical, sustained by differences of temperature; (2) the horizontal, having its source in the energy supplied by the wind. The phenomena ordinarily described as ocean currents belong wholly to the latter. These currents have their origin in the impulse given the layer of water immediately at the surface by the wind. This impulse, by virtue of internal friction, is communicated downward, but with extreme slowness; the rate of propagation being expressed by the formula

$$\sqrt{t} = 1736 \cdot x \cdot \frac{v_0}{n}$$

in which v_0 is the velocity at the surface, and t the interval (in seconds) required to communicate a velocity v_0/n to a layer at a depth of x meters. Immediately at and near the surface the currents will thus be quite as variable as the winds themselves. The truth of this was shown by a comparison of the observed frequency of winds from the several quadrants with the observed frequency of currents towards the opposite quadrants for various portions of the sea. For the area in the North Atlantic Ocean bounded by the parallels 40°–45° N., and the meridians 30°–35° W. the percentages were as follows:

Winds....N. E. 16, S. E. 20, S. W. 36, N. W. 28.
Currents.. S. W. 20, N. W. 18, N. E. 31, S. E. 31.

At some little distance below the surface these irregularities disappear, in consequence of the sluggishness with which the impulse given by the wind is transmitted downward. Here the changes of the wind, as they occur from day to day, are no longer felt; and the waters probably move in a fixed direction and with a constant velocity, namely, that which the above formula would give them if there prevailed continuously at the surface a wind having the force and direction of the resultant of the actual winds.

At the 580th meeting, held February 13,

Mr. Winston spoke briefly on the plans of a committee of delegates at Paris appointed in the interest of an international auxiliary language intended to serve as a medium of communication especially between scientific men.

Mr. R. A. Harris, of the Coast and Geodetic Survey, in a paper entitled 'On the Feasibility of Measuring Tides and Currents at Sea,' suggested the use of a piano-wire sounding apparatus for such measurements, and ascertained the magnitudes of errors which might be involved when the weight of the wire, impulse of the current and inaccurate estimates of verticality at the surface are involved. The sounding 'lead,' which is not to be recovered in deep water, consists of some weight, a box of stones for example, sufficiently heavy for permitting a suitable tension to be obtained. The measurements of the rise and fall of the tide, as here suggested, necessitate much greater care than do those of the tidal streams and other currents.

Mr. F. J. Bates, of the Bureau of Standards, then spoke on 'The Effect of a Magnetic Field on Plane-polarized Light.' Commencing with Faraday's discovery in 1849, the historical development of the subject was followed and ended with the speaker's work on the rotary dispersion of anomalous dispersing substances. Solutions of fuchsin, cyanin, lackmus and analine-blue were studied with a sensitive-strip spectral polariscope and a magnet which gave 18,000 lines per sq. cm. The differences between 1 cm. cells of solvent and solution were noted. In no instance was it possible to observe an anomaly in the rotation, even though the sensibility of the apparatus was ten times that of preceding investigators. The anomalous effects observed by Schmauss were shown to be due to the effect of the selective absorption of the solutions studied. For a detailed account of the work see Bates, *Wied. Ann.*, No. 13, 1903.

CHARLES K. WEAD,
Secretary.

CHEMICAL SOCIETY OF WASHINGTON.

THE 148th regular meeting of the Chemical Society of Washington was held Thursday evening, February 11, in the Assembly Hall of the Cosmos Club. The program for the evening consisted of an address by Professor Wilder D. Bancroft, of Cornell University, upon the subject 'Inorganic Chemistry and the Phase Rule.'

The speaker discussed the subject under the two general heads—the phase rule as an instrument for research and secondly the phase rule as a rational basis for the classification of inorganic chemistry. Under the first of these topics he cited a large number of illustrations of cases to which the phase rule has been successfully applied. Among these was mentioned the work of van't Hoff and his associates upon the Stassfort salt deposits. Also the work which is now being carried on at Cornell University on the bronzes. The application of the phase rule to the separation of mixtures of salts by crystallization was illustrated briefly by referring to the case of a mixture of sodium and potassium chlorides.

A. SEIDELL,
Secretary.

THE ELISHA MITCHELL SCIENTIFIC SOCIETY.

THE 152d meeting was held in Person Hall in the Chemical Lecture Room on February 9, at 7:30 P.M. The following papers were given:

DR. W. C. COKER: 'Mendel's Law of Heredity.'

DR. H. V. WILSON: 'Incomplete Division in Vertebrate Animals.'

PROFESSOR COLLIER COBB: 'Composition of Coastal Plain Sands in Relation to Distance from Existing Shore Lines.'

ALVIN S. WHEELER,
Recording Secretary.

DISCUSSION AND CORRESPONDENCE.

CONVOCATION WEEK.

TO THE EDITOR OF SCIENCE: The first thing to be done in connection with the convocation week meetings of the scientific societies is to secure a more perfect organization. Some man or committee must take up the matter of arranging a complete program so as to avoid the present go-as-you-please condition in which meetings are set at almost any time in the week. This is one of the causes of the