

which does not, there is no question but that we should take up next the case of a substance which dissociates into a vapor and a liquid or a vapor and a solid. An instance of this last is calcium carbonate, which dissociates on heating, forming carbonic acid and calcium oxide. This is a two-component system, but it has been derived from a one-component system by heating, and is therefore discussed by Duhem. This is a very ingenious way of attacking the subject, and has the great merit that the transition from one to two components is made gradually and not abruptly. It has the disadvantage that one has to cover this intermediate ground a second time when studying two-component systems. What Duhem has done is to consider, in this volume, systems such that the sum total of all the masses in all the phases can be represented by the chemical formula for a compound.

The book is divided into three parts, the first of which includes saturated vapors, the phenomena of boiling, change of freezing point and equilibrium between solid and solid, dissociation curve for two solids and vapor, the triple point and the curves meeting in it. The second part of the volume deals with the continuity between the liquid and the gaseous states, while dissociation in the vapor phase is taken up in the closing section. Of special interest are the chapters on the phenomena of boiling, on apparent false equilibrium as applied to boundary curves, on dissociation in gases and on the theory of false equilibrium. The book attempts, in an admirable manner, to present exact theory in such a form as to be applicable to experimental data and not to hypothetical or simplified phenomena. Of course, this is a goal which no treatise can hope to attain at the present time; but this volume of Duhem's comes nearer to it than anything that has yet been published. It is not too much to predict that the whole study of organic chemistry will be revolutionized as soon as the points of view suggested by Duhem become well understood. All the phenomena connected with isomerism become capable of quantitative treatment as soon as they are studied experimentally with reference to the theory of false equilibrium and the theory of permanent changes recently developed by Duhem. It seems probable that it

will be possible, by application of these same two theories, to make an intelligent study of all chemical reactions not involving more than four components.

WILDER D. BANCROFT.

SOCIETIES AND ACADEMIES.

THE PHILOSOPHICAL SOCIETY OF WASHINGTON.

THE 478th meeting of the Society was held at the Cosmos Club at 8 p. m., on January 22d. Two papers were presented: The first by Dr. Walter Hough on the 'Origin and Range of the Eskimo Lamps.' The conclusions reached were: That the Eskimo before he migrated from his pristine home had the lamp, this utensil being a prerequisite to migration into high latitudes. That one of the most important functions of the lamp is for melting snow and ice for drinking water. That the lamp is employed for lighting, warming, cooking, melting snow, drying clothes and in the arts, thus combining in itself several functions which have been differentiated among civilized peoples. That the architecture of the house is related to the use of the lamp. The house is made non-conducting and low in order to utilize the heated air. That the lamp is a social factor, peculiarly the sign of the family unit, each head of the family (the woman) having her lamp. That the invention of the lamp took place on some seacoast, where fat of aquatic mammals of high fuel value was abundant, rather than in the interior, where the fat of land animals is of low fuel value. That the typical form of the lamps arises from an attempt to devise a vessel with a straight wick edge combined with a reservoir giving the vessel an obovate or ellipsoidal shape.

Finally, from observation of lamps from numerous localities around the Eskimo shoreline, it is concluded that lamps in low latitudes below the circle of illumination are less specialized than those of higher latitudes. For instance, the lamps of southern Alaska have a wick edge of two inches, while those of Point Barrow and northern Greenland have a wick edge of from 17 to 36 inches in width. It becomes possible, then, to say with some certainty the degree of north latitude to which a lamp appertains, light and temperature being

modifying causes. Driftwood, the fuel supply, and the presence or absence of materials from which to construct the lamp must also be considered. The cause of the large lamps coming down so far in latitude on the east is on account of the dipping of the isotherms. The lamps of Labrador are a case in point. There are three kinds of Eskimo lamps—the house lamp, the small lamp for temporary use by hunters and travellers, and the mortuary lamp.

The second paper, by Mr. René de Saussure, on 'A New Method of Plotting Maps and Charts,' was omitted on account of the author's inability to be present.

The third paper, by Professor J. H. Gore, was entitled 'Gheel, a Colony of the Insane.' This last paper was both highly interesting and instructive, but no abstract of it is available at the present moment.

E. D. PRESTON,
Secretary.

GEOLOGICAL SOCIETY OF WASHINGTON.

At the regular meeting of January 26, 1898, one of the principal communications was on the Montreal meeting of the Geological Society of America, by Mr. David White and Mr. Whitman Cross, both of the United States Geological Survey, a subject which has already been fully reported in these columns. There was also some discussion of the paper that was read by Mr. Cross at the preceding meeting.

Mr. G. K. Gilbert, United States Geological Survey, gave a description of the Pueblo (Colo.) folio of the Atlas of the United States, a folio just completed. The ground that he went over is fully covered in the printed descriptions to accompany the folio.

W. F. MORSELL.

U. S. GEOLOGICAL SURVEY.

THE ENGELMANN BOTANICAL CLUB.

The club met at the Shaw School of Botany, St. Louis, on January 13th, thirty-four members present. The following officers for 1898 were elected: President, William Trelease; Vice-Presidents, Geo. W. Letterman, Henry Eggert; Secretary, Hermann von Schrenk.

Professor L. H. Pammel briefly discussed the flora of Iowa, giving an account of the topography and climatology, and their bearing on

the distribution of plants in that State. He spoke of a series of ponds which had dried to such an extent that the collected humus burned when lighted. These ponds had been flooded last year and a surprisingly large number of aquatic plants had apparently survived the drying process.

Mr. J. B. S. Norton spoke on the coloring matter of some Borriginaceæ. He described some specimens of *Plagiobothrys Arizonica*, which stained paper a violet-purple, and attributed this to alkanin. The occurrence of this dye in other North American Borriginaceæ was discussed.

Mr. H. von Schrenk presented some notes on the dry-rot fungus, *Merulius lacrymans*, which had been found in the beams of a building in which the floors had fallen in. He exhibited specimens of the fungus collected in fallen cypress logs in northwestern Mississippi. Some other fungi collected in that region were discussed.

HERMANN VON SCHRENK,
Secretary.

NEW BOOKS.

The Sun's Place in Nature. NORMAN LOCKYER. New York and London, The Macmillan Co. 1897. Pp. xvi+360. 12s.

Various Fragments. HERBERT SPENCER. New York, D. Appleton & Co. 1898. Pp. 208. \$1.25.

The Mystery and Romance of Alchemy and Pharmacy. C. J. S. THOMPSON. London, The Scientific Press, Ltd. 1897. Pp. xv+335.

The Barometrical Determination of Heights. F. J. B. CORDIRO. New York and London, Spon & Chamberlain. 1898. Pp. 28. \$1.00.

Traité de zoologie concrète. YVES DÉLAGE and EDGARD HÉBOUARD. Volume V. *Les vermidiens.* Paris, Schleicher Frères. 1897. Pp. xi+372.

Le Rationnel. GASTON MILHAUD. Paris, Alcan. 1898. Pp. 179. 2 fr. 50.

Energetische Epigenesis und epigenetische Energieformen. GEORGE HIRTH. Munich and Leipzig, G. Hirth. 1898. Pp. xiv+218.

Outlines of Sociology. LESTER F. WARD. New York and London, The Macmillan Company. 1898. Pp. xiii+301. \$2.00.