noted by other observers and myself. The mass of Venus approaches nearer to that of the earth than the mass of any other planet, and it will probably not be very different from the earth in its temperature.

In the case of the moon the temperature is probably very low. Peal and others regard it as glaciated. Langley says at full moon the temperature is not above 0° centigrade. I need not remind you that the mass of the moon is very small. The mass of Mars is only about one-ninth that of the earth, and it may be on the whole a colder world. The vast polar caps have a great resemblance to snow; they enlarge during the winter and decrease during the summer. The canals, about which so much has been written, are just as likely to be rents or fissures in ice fields, or vast ice crystals on the surface of liquid, as to be vegetation near artificial streams.

Jupiter is the giant world, and if the temperature increases with mass its heat must be very great. Careful scrutiny sustains this view; no polar snow caps can be seen; the belts and spots show so many changes that the best observers regard the planet as a very hot body. Proctor even contended that it radiated heat to the satellites, and was in that respect an additional sun to them.

This speculation is of great interest to me and I would be pleased sometime to continue the subject, but I think enough has been said to show that it is not void of interest, and that going outwards from the Sun temperature seems to increase with mass. I need scarcely remind you that the mass of the Sun itself is vastly greater than that of all the bodies of the system combined, and that his heat is enormous.

SCIENTIFIC JOURNALS.

AMERICAN CHEMICAL JOURNAL FOR JULY.

THE July number of the American Chemical Journal contains an article by W. F. Edwards entitled 'Notes on Molecular and Atomic Refractions.' He offered, sometime ago, a new formula, $\frac{P(M-1)}{MD}$, for molecular refraction, and the present paper contains the results of further research and comparisons of the results obtained by the use of his formula with those obtained with the formulæ of Gladstone and Lorentz-Lorenz. He has compared a number of cases of acids and ethereal salt and has determined the change caused by the addition of CH_2, and the numbers representing the atomic refractions of hydrogen, oxygen, nitrogen, chlorine, bromine, iodine and sulphur, in terms of his formula.

By the use of his formula he can tell whether the nitrogen is present in the trivalent or univalent condition; but with the others this is impossible. Although a great number of observations are available the results are not such as would render any general conclusions possible in many cases. Hite, and Orndorff and Cameron, describe the pieces of apparatus which they have devised for determining molecular weights by the boiling-point method. They both call attention to the great influence of pressure on the boiling point and the necessity of making corrections for it. The two methods vary in details, the apparatus of Orndorff and Cameron being much simpler and easily made by any student, while specially constructed apparatus is needed for Hite's method. Numerous examples are given by both of very satisfactory results obtained.

Seldner has tried parallel experiments to those of Gautier in which diacetamide is formed by heating acetonitrile and acetic acid together. He used glutaric acid and its nitrile, and whether he mixed glutaric acid and acetonitrile, or glutaric nitrile and acetic acid, or glutaric acid and glutaric nitrile, in each case he obtained the same product, the glutaramide. DeChalmot, who has been studying the pentoses of plants, advanced the hypothesis that in

plants pentose molecules are formed in complex molecules of hexosans in which a part or all of the aldehyde groups have been bound by condensation, and are thereby preserved from further oxidation. He considers the pentoses to be formed from hexoses by the end alcohol group being oxidized and then losing carbon dioxide. The investigation was only carried far enough to show that probably the hexosans are oxidized to the aldehyde.

H. C. Jones publishes the results of a method that can be used for the determination of formic acid by oxidizing it with potassium permanganate. The method he used was as follows: After making the formic acid solution alkaline with sodium carbonate, it was treated with an excess of a standard solution of potassium permanganate. The formic acid was all oxidized to carbon dioxide and water. The solution was then acidified and a measured volume of oxalic acid run in until the solution became clear, and the excess of acid determined by the permanganate solution. The two solutions were then compared and the necessary data secured for calculating the amount of formic acid.

Several reviews of books on chemistry are included in this number, the principal one being the review of Palmer's translation of Nernst's 'Theoretical Chemistry.'

J. Elliott Gilpin.

NEW BOOKS.

Zeit- und Streitfragen der Biologie. Oscar Hertwig. Vol. I. Jena, Gustav Fischer. 1894. Pp. iv+143. M 3.

Report of the International Meteorological Congress. Pt. II. Edited by Oliver L. Fassig. Washington, Weather Bureau. 1895. Pp. 583.

The Gospel of Buddha. Paul Carus. Chicago, The Open Court Publishing Co. 1895. Pp. xiv+275. 35 cents.

The Cell. Oscar Hertwig. Translated by M. Campbell and edited by Henry Johnston Campbell. London, Swan & Sonnenschien. New York, Macmillan & Co. 1895. Pp. vi+368. $3.

Hydrodynamics. Horace Lamb. Cambridge University Press. New York, Macmillan & Co. 1895. Pp. xviii+604. $6.25.

Transactions of the American Institute of Electrical Engineers. Vol. IX. New York City, The Institute. 1894. Pp. xii+938.

Petrology for Students. A. Harker. Cambridge University Press. New York, Macmillan & Co. 1895. 12mo. $2.

The Great Frozen Land. Frederick George Jackson. New York and London, Macmillan & Co. 1895. Pp. 414. $3.25.

Annuario publicato pelo Observatorio do Rio de Janeiro. Rio Janeiro, Lombaerts & C 1895. Pp. x+374.

Studies in Spherical and Practical Astronomy. George C. Comstock. Madison, Wis., The University. 1895. Pp. 106. 40 cts.

Experimental Study of Field Methods which will insure to Stadia Measurements greatly increased Accuracy. Leonard Sewal Smith. Madison, Wis., The University. 1895. Pp. 145. 35 cts.

A Contribution to the Mineralogy of Wisconsin. William Herbert Hobbs. Madison, Wis., The University. 1895. Pp. 156. 40 cts.

On the Quartz Keratophyre and associated Rocks of the North Range of the Baraboo Bluffs. Samuel Weidman. Madison, Wis., The University. 1895. Pp. 56. 25 cts.

The Finances of the United States from 1775 to 1789 with especial reference to the Budget. Charles J. Bullock. Madison, Wis., The University. 1895. Pp. viii+273. 75 cts.

Inductive Psychology. E. A. Kirkparick. New York and Chicago, E. L. Kellogg & Co. 1895. Pp. 208.