

ON THE KINETIC THEORY OF EVAPORATION.¹

By A. MARCH.

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The determination of the dependence of the pressure of saturated vapors on temperature has been the object of much theoretical investigation. Those attempts proceeding purely from the thermodynamical standpoint assume the heat of evaporation to be a linear function of the temperature, apply the laws for a perfect gas to vapors, and neglect the specific volume of the liquid in comparison with that of the gas. The general result, known as the Dupré-Rankin equation, is of the form

$$\log p = A - B/T - C \log T,$$

where p is the vapor pressure, T the absolute temperature, and A , B , C , are constants, and this is in excellent agreement with experiment if the values of the constants are determined from observed data. On the other hand, attempts have hitherto failed to deduce the constants from purely theoretical thermodynamical grounds. The present author here considers the theory from the molecular kinetic standpoint. He finds that the heat of evaporation and the specific volume must be determined as functions of the temperature, and to determine the vapor-pressure law he describes at some length a molecular mechanical model based on critical data. The result of the investigation is to establish van der Waal's vapor-pressure formula.—*H. H. Ho[lgson].*

TEMPERATURE OF THE OCEAN BELOW THE 500-FATHOM LINE ON THE WEST COAST OF AMERICA.²

By A. H. CLARK.

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The observations upon which this discussion is based were made from the *Albatross* off the west coast of America from Chile to the Bering Sea.

The most striking feature of the abyssal temperatures at depths exceeding 2,000 fathoms is the small range of maximum variation, which is about 1°F. The observed temperature at each depth is compared with the average for all the oceans at that depth as obtained by Murray and Hjort, and the following general results are obtained: Temperatures are all above the average from Chile to the Gulf of California, and are all below the average from the Gulf of California to the Bering Sea. They are considerably below the average off southern California and the Gulf of Alaska, and slightly below from central California to Alaska. It is supposed that the equatorial countercurrent flowing eastward is deflected mainly to the south by the California current flowing southward, and that this condition of affairs accounts for the result given.—*R. C[orless].*

SURFACE CURRENTS OF JUPITER DURING 1915-1916.³

By S. BOLTON.

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During the favorable opposition of Jupiter in 1915, 2,139 transits of dark and light markings were obtained between 1915, September 9, and 1916, February 9, made with the 26-inch reflector at Bramley, near Leeds. The more prominent phenomena are tabulated, with the resulting rotation periods. The spots at the southern edge of the north equatorial belt exhibited a marked acceleration of velocity, while the corresponding ones along the north edge of the south equatorial belt moved at the normal rate of 9h. 50m. 27.8 s., the difference between the two currents being 2.9 seconds. The spot charts show the inconsistency of the rates of motion of the individual spots in nearly all latitudes, the longitudinal drift even of the red spot never for any considerable period remaining constant.—*C. P. B[utler].*

WILLIAM MARRIOTT, 1848-1916.

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Meteorology has lost one of its most ardent supporters by the sudden death of Mr. William Marriott at Dulwich, England, on December 28, 1916. He was 68 years of age (born Aug. 9, 1848), and throughout his life had been remarkably free from illness, but latterly heart trouble had developed. Mr. Marriott commenced his meteorological work at Greenwich Observatory in January, 1869, and he left the observatory at the end of 1871. While at the Royal Observatory he was in the magnetic and meteorological department under Mr. James Glaisher, F. R. S., who was very actively associated with the Meteorological Society. Mr. Marriott became assistant secretary to the Meteorological Society in 1872, and he maintained the position until his retirement in September, 1915, after 43 years' service. He had become a member of the society in 1870 while serving at Greenwich. The science of meteorology has steadily developed during the last half century and Mr. Marriott, in his official capacity, took the keenest interest in furthering its advancement. From 1881 to 1911 he edited the Meteorological Record, which contained the monthly results of meteorological observations over England and Wales. For climatological questions the Meteorological Record has afforded material of great value. Since 1911 this work has been taken over by the Meteorological Office. Mr. Marriott was the author of "Hints to Meteorological Observers" (seven editions), a work which constitutes instructions for taking observations, also "Some Facts about the Weather" (two editions). He was a frequent writer for the Quarterly Journal of the Royal Meteorological Society, his contributions dealing with many and very varied subjects.

¹Physikal. Zeitschr., July 15, 1916, 17: 299-302.
²Jour., Washington Acad. Sci., 1916, 6: 413-417.

³Rep. Astron. Soc., M. N., May, 1916, 76:634-636.