

architects and others who have to deal with the problem of securing quiet. Modern methods of construction do not permit massive walls and partitions, which are the best means of securing sound insulation, and our knowledge of the insulating properties of lighter structures is still restricted. Attic rooms, protected by a parapet on the street side, of a building are comparatively quiet while rooms just below the cornice are generally noisier than ground-floor rooms. Holes in walls should be avoided and the walls themselves should be non-homogeneous or, if possible, of two separate parts. Double glazing of windows on the street side should consist of dissimilar glasses and if possible in separate frames. Machinery equipment should be silent running and be mounted on rubber or cork. A table of sound reductions effected by walls and floors of more than 120 forms with drawings is collected from the published papers of testing authorities in Great Britain and in the United States.

Some Properties of pure $\text{H}^2\text{H}^2\text{O}$. In a communication on the properties of water containing the heavier hydrogen isotope H^2 , G. N. Lewis and R. T. Macdonald (*J. Amer. Chem. Soc.*, July; see also NATURE,

130, 371, Sept. 3, 1932; 131, 590, April 22, 1933) report that they have obtained in one series of electrolyses a quantity of 0.3 c.c. of water in which the proportion of hydrogen as H^2 is calculated as more than 99 per cent. The specific gravity was found to be 1.1059 as against 1.111 calculated for pure $\text{H}^2\text{H}^2\text{O}$, assuming the same molecular volume as for pure water. Further electrolysis until only 0.12 c.c. remained yielded a liquid of density 1.1053, so that it is assumed that electrolysis had been conducted to constant density, which is taken provisionally as 1.1056 at 25° for pure $\text{H}^2\text{H}^2\text{O}$. The sample is regarded as containing not more than 0.01 per cent of hydrogen as H^1 . The freezing point is $+3.8^\circ$ and the normal boiling point 101.42° . The vapour pressure curve indicates that the heat of evaporation is 259 ± 4 gm.cal. per mole greater than that of ordinary water. The determination of the coefficient of expansion showed a temperature of maximum density at about 11.6° . In the various respects in which water is said to be an abnormal liquid, $\text{H}^2\text{H}^2\text{O}$ seems to be more abnormal, but the differences between the two become smaller with rising temperature.

Astronomical Topics

White Spot on Saturn. It is only at long intervals that any markings are seen on Saturn of a character suitable for the determination of rotation-period; hence advantage should be taken of the opportunity afforded by the appearance of a white spot on the equatorial zone. It was detected on August 3 at $22^{\text{h}} 30^{\text{m}}$ U.T. by Mr. William T. Hay at Norbury, having just passed the central meridian. He immediately telephoned to Dr. W. H. Steavenson at West Norwood, who verified the discovery, and noted that the spot was elliptical in outline, and extended in latitude from the south edge of the North Equatorial belt to the projection of the crape ring. The accepted period of rotation for the equator is $10\frac{1}{4}$ hours, so that seven rotations are equal to 3 days less $\frac{1}{4}$ hour; the following are approximate dates of crossing the central meridian:

Aug. 12	1 ^h	and	$21\frac{1}{2}$ ^h
15	$0\frac{3}{4}$	and	$21\frac{1}{4}$
18	$0\frac{1}{2}$	and	21
21	$0\frac{1}{4}$	and	$20\frac{3}{4}$
24	0	and	$20\frac{1}{2}$

Observation in Astronomy. The inaugural lecture of the new Savilian professor of astronomy in the University of Oxford, Prof. H. H. Plaskett, entitled "Observation in Astronomy" (see NATURE, May 6, p. 648) has recently been published (Oxford: Clarendon Press; London: Oxford University Press, 1933. 2s. net.) Prof. Plaskett pointed out that in all ages there have been advocates of the two methods, the observational and the theoretical, of making progress in astronomy. The accurate observations of Tycho Brahe afforded the means of deducing Kepler's laws, which were a step in Newton's discovery of gravitation. To a great extent, Sir William Herschel anticipated modern methods and results. His picture of island universes was very like the modern views on the spiral nebulae, differing only in the adoption of a considerably smaller scale of distances. On this point Prof. Plaskett said the present distances should be received with some caution; he referred to van

Maanen's internal motions in the spirals, which, if verified, would involve much smaller distances.

As a fine piece of purely theoretical work, Prof. Plaskett referred to the results that had been obtained as to the conditions in the interior of stars; regions which will probably never be accessible to direct observation. He then paid a tribute (as Prof. Pio Emanuelli had also done recently) to the value of Sir Norman Lockyer's early spectroscopic work, which led ultimately to the isolation of helium, a gas of transcendent importance in stellar physics. Lockyer's conclusions as to stars of rising and falling temperature did not receive much attention at the time, but were afterwards revived by Prof. H. N. Russell from work on different lines from Lockyer's.

Prof. Plaskett paid a tribute to the energy of his predecessor, the late Prof. H. H. Turner, who in spite of the rather poor weather conditions at Oxford completed his section of the astrographic catalogue at an early date. He also made the welcome announcement that Congregation had sanctioned the expenditure of £2,400 for a new solar telescope and spectrograph. Work on the sun is less affected by poor skies than work on faint stars.

Occultation of Regulus on April 6. *L'Astronomie* for June contains an interesting photograph of this phenomenon, taken at the Flammarion Observatory, Juvisy, by M. F. Quéniisset. The moon was kept stationary on the plate by hand-guiding, so that there are a series of images of the star on both sides of the moon; the nearest to the moon were exposed $1\frac{3}{4}$ minutes before immersion and 3 minutes after emersion. The phenomenon was observed visually with another telescope. Both phases were absolutely instantaneous, and the bluish-white light of the star contrasted with the yellowish light of the moon.

The clearness of the sky and the sensitivity of the plate are shown by the fact that the earth-lit portion of the moon was photographed, though the moon was nearly four days after first quarter. The sun-illuminated part is much over-exposed, but faint traces of the *maria* can be seen, also craters near the terminator.