

Early Science at Oxford.

February 1, 1683-4. Mr. Desmasters gave us an account of some experiments lately made by him, concerning ye expansion of Water frozen; he observed, that a cylindrical tube of $\frac{1}{4}$ of an inch diameter, being filled with water, to ye height of 2 inches, and set to freeze, in a mixture of snow, and salt; ye water, when perfectly frozen, appeared $\frac{1}{8}$ of an Inch above ye marke it stood at before ye freezing began. Another cylindrical tube of almost an inch diameter, being filled with water to ye height of 6 inches, and set to freeze as before; ye water in freezing rose $\frac{1}{8}$ of an inch; he observ'd farther, that when ye water thus set in snow and salt, began to freeze, a great number of small bubbles rose continually from ye bottom for some time. Mr. Ballard has observed of late, that half a pint of water frozen, lost $\frac{3}{10}$ — $\frac{3}{10}$ —grviiij of ye weight it was of, before ye freezing; this experiment he tried a 2d time; ye success was much ye same, as at ye first. It was then queried, whether water, out of which ye air is pumpt, will rise in ye middle in the time of its freezing? and whether boiled water rises in freezing? Dr. Plot, and Mr. Ballard, undertook to trye these experiments.

Mr. Ballard gave an account of his success in trying some of Mr. Chamar's Experiments; whereas amongst other things Mr. Chamar says that Iron touched will loose its vertue, by being filed; Mr. Ballard says, this is true, if ye Iron be filed *all over*, not otherwise. Dr. Plot shewed some of ye Turkish *Rusma*, and *Alcanna*, which he lately received from Mr. Smith, Student of Christ Church, and chaplain to ye Factory at Smyrna, who wrote of ye use of ye Rusma, the *Alcanna* is ye leaf of a plant, dried, and powdered; which, when steeped a night in wine, will die ye nails red; and I suppose ye gentleman means Smyrna, or such like wine, for (as Dr. Plot tells us) it will not succeed with Canary, or Claret.

Dr. Plot then proposed, and it was ordered by ye Society, that an exact account of ye weather should be kept, either according to Mr. Lister's, or some such compendious, method; and that at ye end of this, and other years, ye account of ye weather of preceding years, one or more, should be printed with an almanac for ye year to come.

February 1, 1686-7. An account was communicated by Mr. Musgrave of a way to preserve beef for three quarters of a year, and then half a year more after roasting.—An account of two high tides at London Jan. ye 28th, one 5 hours after the other.—An account of several extraordinary productions of a fœtus, bred out of a cat and a rat; the cat being the dam. This fœtus is now to be seen at the Earl of Abingdon's, as likewise a *Hirco-cervus* bred of a goat and a deer at ye same place. An account of several productions of a colour different from that of their species: e.g. of a white Ouzle or Black-bird, of white mice at one Mr. Tillyard's, an Apothecary in Oxford; of white Woodcocks, Partridges, Pheasants, &c. seen by several of the Society.

February 2, 1685-6. A letter from Mr. Nicholson to Sir Wm. Dugdale concerning the Runic Inscription at Bridekirk was communicated by Dr. Plot.—A Paper of Dr. Papin's explaining ye use of his Water Engine was also read.

February 3, 1684-5. Two letters from Mr. Cuningham, of St. Leonards College, were read: the latter of these mentions a way used in Scotland for ye cleansing mines of noxious vapors; the miners carry down a candle, in a dark lantern, covered with a wet cloth; then, lying flat on their faces, they, in that posture, kindle, and maintain a fire, which carryes off ye vapors, without injuring ye miners.

Societies and Academies.

LONDON.

Royal Society, January 21.—R. E. Gibbs: Structure of a quartz. Investigations on quartz have shown that symmetry and X-ray data enable only partial definition of structure. Intensity measurements and general physical properties of the material must also be studied. Oxygen atoms occupy positions $c/9$ above and below the silicon atoms. Only a small structural change accompanies the transition from β to α quartz, but still the tetrahedral character of β quartz is lost. The structure proposed assumes the crystal to be non-molecular and the oxygen to occupy basal planes as noted above. The silicon atoms seem to move about 0.3 Å.U. from their β -positions.—N. K. Adam and G. Jessop: The structure of thin films, Pt. vii. Critical evaporation phenomena at low pressures. By means of a new apparatus, measurements of the surface pressure of monomolecular films have been made at room temperature, down to 0.01 dyne per cm. At areas greater than about 5000 sq. Å.U. per molecule, the pressures exerted by films of insoluble fatty substances tend to a value within 25 per cent. of that given by the equation $Fa = RT$, R having the same value as in a perfect gas. The divergences from the theoretical values are probably within experimental error. Between 100 and 5000 sq. Å.U. the pressure-area isothermals closely resemble those for liquid and vapour in three dimensions. Expanded films are analogous to liquids, not vapours, and there is considerable cohesion between the molecules in them.—H. J. Gough, D. Hanson and S. J. Wright: The behaviour of single crystals of aluminium under static and repeated stresses.—C. H. M. Jenkins: The determination of the vapour tensions of mercury, cadmium, and zinc by a modified manometric method. The apparatus consists of a specially designed manometer, using the material under determination as the observed liquid in this gauge; it can be inserted in a 3-inch diameter electric tube furnace. The pressure on the apparatus is regulated by means of nitrogen, the pressure of which is measured on an independent barometer. The vapour pressure of the liquid is measured over a free surface in the closed end of the manometer by alterations in the pressure of the nitrogen to bring both liquid surfaces in this gauge level. The apparatus is similar to the letter V in shape. One extremity is closed; the other opens into a long straight column bent at right angles to it. Into this column specially shaped pieces are inserted, transforming it into a reflux condenser, which counteracts the diffusion of the nitrogen into the vapour. Values have been obtained for the vapour tensions of mercury, cadmium, and zinc over the range of pressure from 15 to 1500 mm. The boiling-points (760 mm.) have been found to be 357°, 767° and 906° C. respectively.—W. Barlow: The configuration of the carbon atom and the geometrical relations of this configuration to those of other atoms, as evidenced in the chemical and crystallographic structures of organic chemistry. Pt. i.—Ursula Andrewes, Ann C. Davies and F. Horton: The soft X-ray absorption limits of certain elements. Investigations have been made of the voltages corresponding to critical values of electron energy associated with some of the longer wave-length absorption stages of seven successive elements, chromium, manganese, iron, cobalt, nickel, copper and zinc. The generally accepted value of an absorption limit, obtained by spectroscopic methods, corresponds not to ionisation of the atom by the detachment from it of an electron in the sub-