Early Science at the Royal Society.

November 16, 1664. The Secretary produced a small French book, written by father Charles Burgonis against Monsieur Pascal's treatise of the equilibrium of liquors and the weight of the air. The president took it home for his perusal, in order to give an account of it to the society.

1667. Mention being made, that a security might be provided for such inventions or notions, as ingenious persons might have, and desired to secure from usurpation, or from being excluded from having a share in them, if they should be lighted on by others; it was thought good, if any thing of that nature should be brought in, and desired to be lodged with the society, that, if the authors were not of their body, they should be obliged to show it first to the president, and that then it should be sealed up both by the small seal of the society, and by the seal of the proposer; but if they were of the society, then they should not be obliged to shew it first to the president, but only to declare to him the general heads of the matter, and then it should be sealed up, as mentioned before.

1676. Mr. Oldenburg communicated a third letter to himself from Signor Cassini, acquainting the Society with some of the astronomical observations made in 1672, by Mons. Rocher, at Cayenne in America, whither he had been sent by the Royal Academy of Sciences at Paris.

1681. The president (Sir Christopher Wren) discoursing concerning the library of the Society, promised to give five pounds to be expended on books of geometry.

November 18, 1663. Mr. Palmer presented the society with a very artificial gun of Caspar Calthof's contrivance, lodging at a time seven bullets and powder in proportion, and discharging them at seven several times. He had the thanks of the society; and it was ordered, that he should be registered as a benefactor. Sir Robert Moray mentioned, that prince Rupert had contrived a gun exceeding all that had hitherto been invented of that kind, discharging several bullets with ease and without danger. Sir Robert Moray was desired to request prince Rupert to send his powder-tryer with a loose and fixed ferrel to the society, to try his experiments of the force of powder therein.

November 19, 1662. Dr. Charlton gave an account of making the powder for embalming birds, and preserving them and their feathers to the life. He was desired to communicate in writing the whole process, according to the relation made by him.

1668. Mr. Oldenburg read a letter from the vice-chancellor of the university of Oxford to Mr. Boyle, importing, that he would endeavour to procure an exchange of the manuscripts now in the possession of the society, for such books as were proper for their purpose. — Mr. Oldenburg produced the curiosities sent from the Bermudas which he had lately retrieved, after having been missing for several weeks, the captain of the ship, to whom they had been recommended, not remembering what was become of them.

November 20, 1673. The lord bishop of Salisbury acquainted the Society, that those eminent citizens of London, who had been formerly deputed by the City and the Mercers' company to invite the Royal Society to return to Gresham College, viz., Sir John Laurence, Sir Richard Ford, Sir Thomas Player, and Mr. Rowland Wynne, had, upon occasion expressed, that they should esteem it as an honour to be elected into the Royal Society: whereupon his lordship now proposed them all four as candidates.

Societies and Academies.

LONDON.

Royal Society, November 6.—T. R. **Merton**: On ultra-violet spectro-photometry. A "neutral wedge" of platinum can be used for measurements of radiations so short as $\lambda = 2100$A. These "wedges" require to be calibrated, both as regards the thickness of the platinum as a function of the distance from the thin end of the wedge, and as regards the density gradient for a given change in the thickness of the platinum as a function of the wave-length. The density gradient is sensibly constant from $\lambda = 4000$A to $\lambda = 2500$A.—W. L. **Bragg** and S. **Chapman**: A theoretical calculation of the rhombohedral angle of crystals of the calcite type. The structure of calcite found by X-ray analysis is built on a series of rhombohedral cells, the edges of which meet at an angle of 101° 55′. Other carbonates and sodium nitrate have a very similar form. The rhombohedral angle of about 102° which is present in all cases is not fixed by the symmetry. The angle has been calculated by a consideration of the equilibrium of the calcite structure. It is assumed that the electrostatic forces correspond to those between a charge of $+2e$ at the centre of the calcium atom, $-2e$ at the centre of the oxygen atom, and $+4e$ at the centre of the carbon atom, and that the force of repulsion is directed from the electrostatic centre of each atom. The crystal is given a deformation which does not alter the distance between neighbouring atoms, so that the forces of repulsion do no virtual work. The electrostatic energy for each configuration is then calculated and a value for the rhombohedral angle found which makes the energy a minimum. This is the condition for equilibrium. The rhombohedral angle so calculated differs by 3° or 4° from the observed value. The alteration in rhombohedral angle, when one metal is substituted for another, is very exactly explained.—O. W. **Richardson** and T. **Tanaka**: (1) The striking and breaking potentials for electron discharges in hydrogen. There are three types of discharge from a thermionic electron-emitting cathode in hydrogen at pressures below 1 mm. The striking and breaking potentials for the discharge which sets in at the lowest voltages have the following properties: (*a*) They fall to a limit as the electron emission of the cathode increases; (*b*) these limiting values have a minimum for a pressure which depends on the electrode distance; (*c*) as the electrode distance is diminished the minimum values of the breaking potential approach a lower limit asymptotically. This limit coincides with the strongest ionisation potential of hydrogen. Spectroscopic evidence is adduced in favour of the view that the type of ionisation which occurs at this point is the splitting of an electron from the hydrogen molecule with the formation of ionised H_2. A considerable number of the lines in the secondary spectrum are selectively affected as regards intensity in the different types of discharge. (2) On a *P*, *Q*, and *R* combination in the many-lined spectrum of hydrogen. Starting from a study of the lines of the secondary hydrogen spectrum which are selectively weakened in a thermionic discharge tube at pressures less than 1 mm., we have been able to arrange 24 lines of this spectrum as members of series, with the designations $P(1) \ldots P(9)$, $Q(1) \ldots Q(5)\ Q(7)\ Q(8)$, $R(1) \ldots R(9)$; 15 of the lines satisfy the combination principle

$$P(m+1) + R(m\ 1) = Q(m+1) + Q(m)$$

to within 0·38 wave-number or less. Two others satisfy it to within 0·86. One of these is known to be a blend, and probably the other is also. The