

- XIV. "Account of the Construction of a Standard Barometer, and of the Apparatus and Processes employed in the Verification of Barometers at the Kew Observatory." By JOHN WELSH. Communicated by J. P. GASSIOT, Esq., F.R.S., Chairman of the Kew Observatory Committee of the British Association.

(Abstract.)

After stating the results of experiments, made under the superintendence of the Kew Committee, for the construction of a barometer tube of large diameter by the usual method of boiling the mercury in the tube, the author proceeds to describe a method of filling a tube with the aid of an air-pump. In this process, which is fully detailed in the paper, the tube is so constructed, that when the air has been extracted from it, the mercury enters by atmospheric pressure, provision being made for entirely removing the air which the air-pump has failed to extract. By this method a barometer tube of 1.1 inch internal diameter has been satisfactorily prepared at the Kew Observatory. The author then describes the mounting and mode of observing the standard barometer, proceeds to explain the processes adopted in the verification of barometers, and gives a detailed description of the apparatus for determining the errors of barometers at different atmospheric pressures.

- XV. "On the Aurora." By REUBEN PHILLIPS, Esq. Communicated by Professor STOKES, Sec. R.S. Received March 7, 1856.

In this paper the author enters into various speculations as to the formation and motion of auroral arches. Since it has been found by experiment that the maximum length of the voltaic arc with a given battery is nearly the same in atmospheric air and in highly rarefied air, forming a very perfect vacuum, the author conceives that a streamer begins as a disruptive discharge of finite and very moderate length, (the maximum length very nearly of a continuous discharge,) which starts upwards from the auroral arch, which he