The following communications were read:

I. Observed Transits of the Moon, and Moon-culminating Stars, over the Meridian of Edinburgh Observatory, from June 1 to December 31, 1838. By Professor Henderson.

II. Lunar Occultations of Planets and Fixed Stars, and Eclipses of Jupiter’s Satellites, observed at Edinburgh Observatory in 1838. By Professor Henderson.

III. Moon-culminating Stars observed at the Cambridge Observatory in the Months of November and December, 1838. By Professor Challis.

IV. Occultations observed at Dulwich and Ashurst, from July 31 to December 27, 1838. By Robert Snow, Esq.

V. On the Method of determining the Longitude by Moon-culminating Stars. By Mr. Epps, late Assistant-Secretary to the Society.

The author remarks, that the advantages of moon-culminating observations, for the purpose of determining the difference of longitudes, particularly in the case of distant meridians, are now universally admitted, every other method being found subject not only to greater trouble and difficulty, but to errors far exceeding the limits of those to which the results of moon-culminating observations are liable. But although this method, the merit of introducing which belongs chiefly to Mr. Baily, is justly regarded as the best known, yet the result of a single observation, or of a few observations, is liable to a considerable amount of error, even when the observations are made by the best instruments and the ablest observers; and the object of the present communication is to shew the extent to which the error may be expected to reach.

The moon’s proper motion, on which the method entirely depends, is such, that an error in the observation is necessarily greatly augmented in the resulting longitude; in fact, the error in longitude will always be from 21 times to 35 times the amount of the error of observation. If, then, it be assumed that 0°·2 of time is the probable error of an observed transit, and that the observed interval between the transits of the moon and star is liable to an error of 0°·4, the resulting difference of longitude will be in error from 8 to 14 seconds of time. This is the probable effect, from