The method of observation employed in the determination of absolute longitudes was that of lunar zenith distances, as being best adapted to the largest instrument carried with the expedition, *viz.*, a six-inch transit theodolite, with micrometer eye-piece. This method of observation has not hitherto occupied a prominent position in English astronomical works, and as the results at *Kashghar* cannot but be considered satisfactory, I have thought advisable to enter somewhat at length into the subject and to give an example of the computation of a single night's observations there, drawn up on a form specially prepared from Chauvenet's *formulæ* by J. B. N. Hennessey, Esq., of the Great Trigonometrical Survey.

The subject is gone into somewhat fully in an article furnished by Colonel Walker, R.E., to *Hints to Travellers*, a publication of the Royal Geographical Society (3rd Edition, December 1871), to which the reader is referred.

The instrument employed at Kashghar is furnished with two micrometers, each moving a separate wire, the eye-piece being so arranged that the micrometer wires may be placed parallel either to the fixed vertical or to the fixed horizontal wire of the diaphragm, according as transits or zenith distances are required to be observed.

The distance between the micrometer and centre wires is adjustable at pleasure, and may be set according to the rate of motion of the celestial body observed. A complete observation of the moon, on one face of the instrument, consists in noting the chronometer times of passage of the moon's limb across each of the wires in succession and the corresponding reading of the vertical verniers; a complete pair of observations on both faces gives, altogether, six *times* and four *readings* of the vertical arc. The readings of the ends of the bubble of the level attached to the telescope, object and eye ends being alternately directed towards the object observed, give a correction to be applied to the mean of the readings of the vertical arc which gives a final zenith distance corresponding to the mean of the six chronometer times.

In the example I have given it took me just three quarters of an hour to observe ten complete pairs of zenith distances as before described. A quarter of an hour may be allowed for the observation of three pairs of zenith distances to a star for time, prior to the observations to moon, and an equal time for similar observations after. To complete the observations in the time above mentioned, however, the observer must be thoroughly familiar with his instrument, must have a good recorder, and have his lamps and apparatus in perfect order.

The weak point of the system is that it is only applicable at certain times when the moon is favorably situated for observation; still, however, even in this respect it contrasts favorably with all other methods, excepting that of "lunar distances," for determining longitudes. I give some rules which have been laid down on this subject by Colonel Walker in the *Hints to Travellers*, modified by subsequent experience: they may I hope be of use to future explorers.

"Take pairs of observations of zenith distance on a star for the determination of the local time and chronometer error, then take other pairs of observations of zenith distance on the moon; in each instance adopt the mean of the chronometer times as that of the 'complete observation' of zenith distance. Both moon and star should be as nearly easterly or westerly as possible, and not very near (say within 10° of) the horizon. The operations should commence and close with star observations, in order that the chronometer