eliminated by a correction of a quantity less than 7 seconds (in space), to the catalogues of Bradley or Piazzi; within which limits even the best modern catalogues do not always agree.

The author then examines, and compares with various catalogues, the cases of these 30 stars in right ascension, and 14 stars in north polar distance; and the result of his inquiry is, that the differences (wherever they exist) are, with only one exception, to be attributed to errors in the catalogues of Bradley, Piazzi, or Pond. The exception here alluded to is a very remarkable one: for not only was the error committed by the two separate and independent computers who formed the catalogue; but the author himself fell into precisely the same mistake (even as to every figure) in repeating the calculation.

The author concludes by remarking, that hitherto it has been reasonably inferred that we could compute the place of a star with great accuracy for any distant period; but that the recent catalogue of Mr. Pond has dispelled this illusion, and has shewn most clearly, that, owing to the imperfections of some one or other of the catalogues (from which even the catalogue of Mr. Pond is not exempt), the result cannot be depended on for that degree of accuracy which the present state of astronomy demands; and that, in order to attain the utmost perfection, the catalogues ought to be re-examined, re-observed, re-computed, and re-compared every 20 or 30 years.

The epoch of Flamsteed's catalogue is 1690; and just 120 years afterwards appeared the catalogue of Bradley, the work of a foreign hand. Since the time of that indefatigable astronomer (a period of nearly 70 years) the subject has been almost entirely lost sight of in this country, as no materials have been collecting for a similar production till the late determination of Mr. Pond to turn the immense powers in his possession to this limited revision of the heavens.

3. " On the method of computing the longitude from an observed occultation of a fixed star by the moon, by Edward Riddle, Esq."

In the method of computing recommended in this paper, the usual data are to be taken from an ephemeris, for the estimated Greenwich time of the observed occultation; and setting aside refraction, by which the star and the apparent place of the lunar disc where the occultation takes place are equally affected, the apparent place of that point is the same as the true place of the star. Now, if from the true place of the point of occultation two perpendiculars be let fall, one on the meridian passing over the star, and the other on that passing over the true place of the moon's centre, then the rectangle under the *cosecant* of the polar distance of the point of occultation, and each of these perpendiculars, will give, respectively, the measure of the parallax in right ascension, and that of the difference between the right ascension of the point of occultation and the moon's centre.

The former of these being added to the star's right ascension when the occultation is west of the meridian, and subtracted from it when east, and the latter added at an emersion and subtracted at an immersion, the result is the right ascension of the moon's centre; whence the Greenwich time may be inferred from an ephemeris.

The author investigates two sets of formulæ for making the calculation, and gives skeleton forms for computing, with tables for finding the geocentric latitude, and adapting the moon's equatorial parallax to the latitude of the place of observation; and three examples from observations of the occultation of *Aldebaran*, October 15th, 1829, are worked out at length.

Putting M for the moon's horizontal parallax, L for the geocentric latitude, P for the star's polar distance, H for its horary angle, and letting fall a perpendicular from the reduced place of the zenith on the star's polar distance, Mr. Riddle computes directly the two segments into which this perpendicular divides the polar distance; and calling the segment adjacent to the pole, A, and that adjacent to the star, B, it is shewn in the first set of formulæ that the parallax in polar distance $= M \,.\, \cos L \,.\, \operatorname{cosec} A \,.\, \sin B \,.\, \cos H$; and in the second, after computing directly by Napier's analogies the angle S at the star formed by the zenith and polar distances, it is shewn that the parallax in polar distance $= M \,.\, \cos L \,.\, \sin H \,.\, \cot S$.

Hence the true polar distance of the point of occultation is found; and thence, by a short process, the difference between the right ascensions of the star and the moon is obtained. When the time deduced from the moon's right ascension, computed in this manner, differs materially from the estimated Greenwich time, the difference between the right ascension of the point of occultation and that of the moon's centre, is directed to be recomputed with the moon's polar distance, taken for a minute or two earlier or later, and a new corresponding Greenwich time found; and a formula, depending on simple proportion, is then given, by which the true Greenwich time may be inferred with sufficient exactness.

In concluding, Mr. Riddle shews how, from the time at which the moon and the star have the same right ascension, as given in the elements for computing the occultations in the *Nautical Almanac*, and the horary motion in right ascension, the preceding computations may be made available to determine directly the time at Greenwich, without any reference to the moon's right ascension.

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