
**Reports On Observations of Encke's Comet During Its
Return in 1871**

Harkness William

Title: Reports On Observations of Encke's Comet During Its Return in 1871

Author: Harkness William

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WASHINGTON OBSERVATIONS FOR 1870.—APPENDIX II.

REPORTS

ON

OBSERVATIONS OF ENCKE'S COMET

DURING ITS RETURN IN 1871.

BY

ASAPH HALL AND WM. HARKNESS.

PROFESSORS OF MATHEMATICS, U. S. NAVY.

PREPARED AT THE U. S. NAVAL OBSERVATORY

BY ORDER OF

REAR-ADMIRAL B. F. SANDS, U. S. N.,

SUPERINTENDENT.

WASHINGTON:
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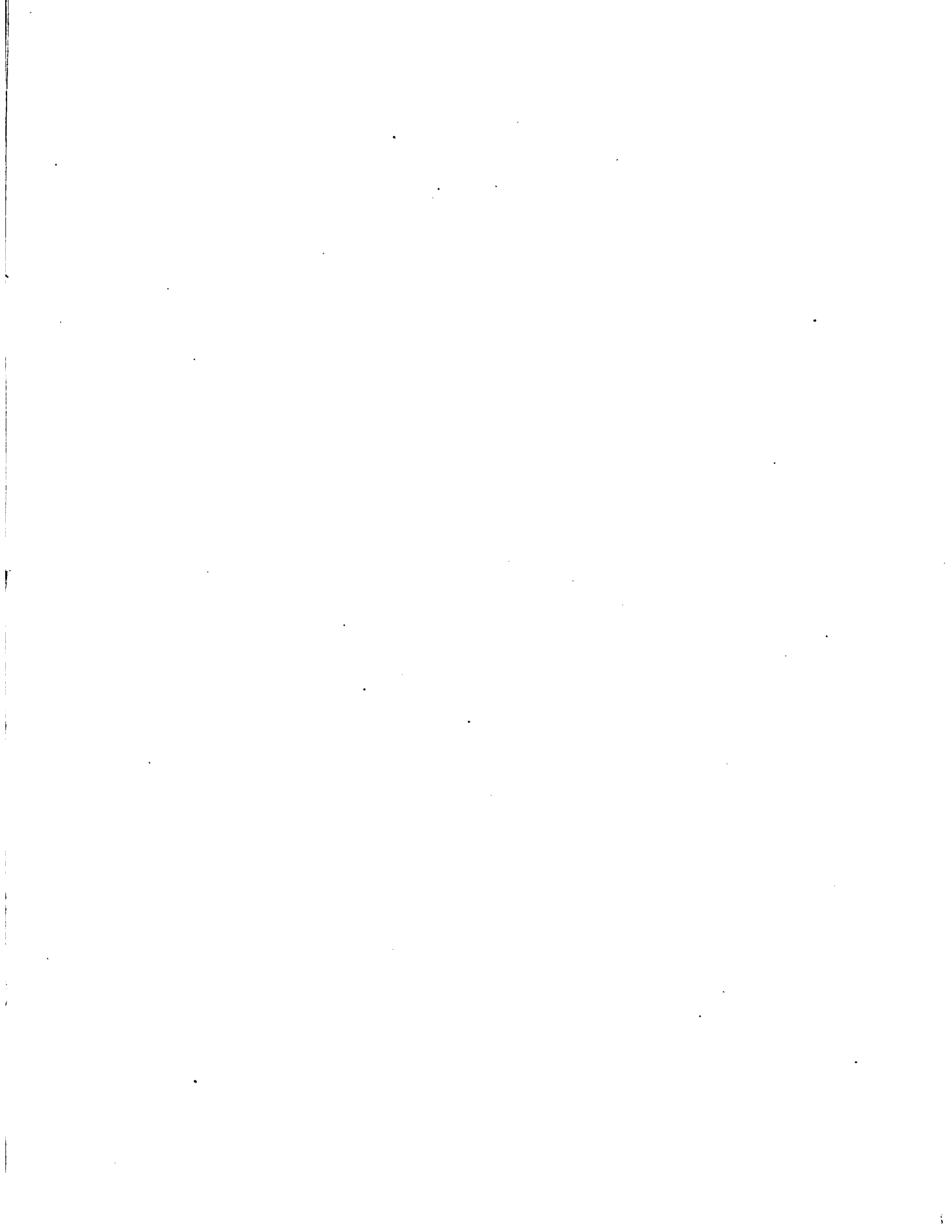
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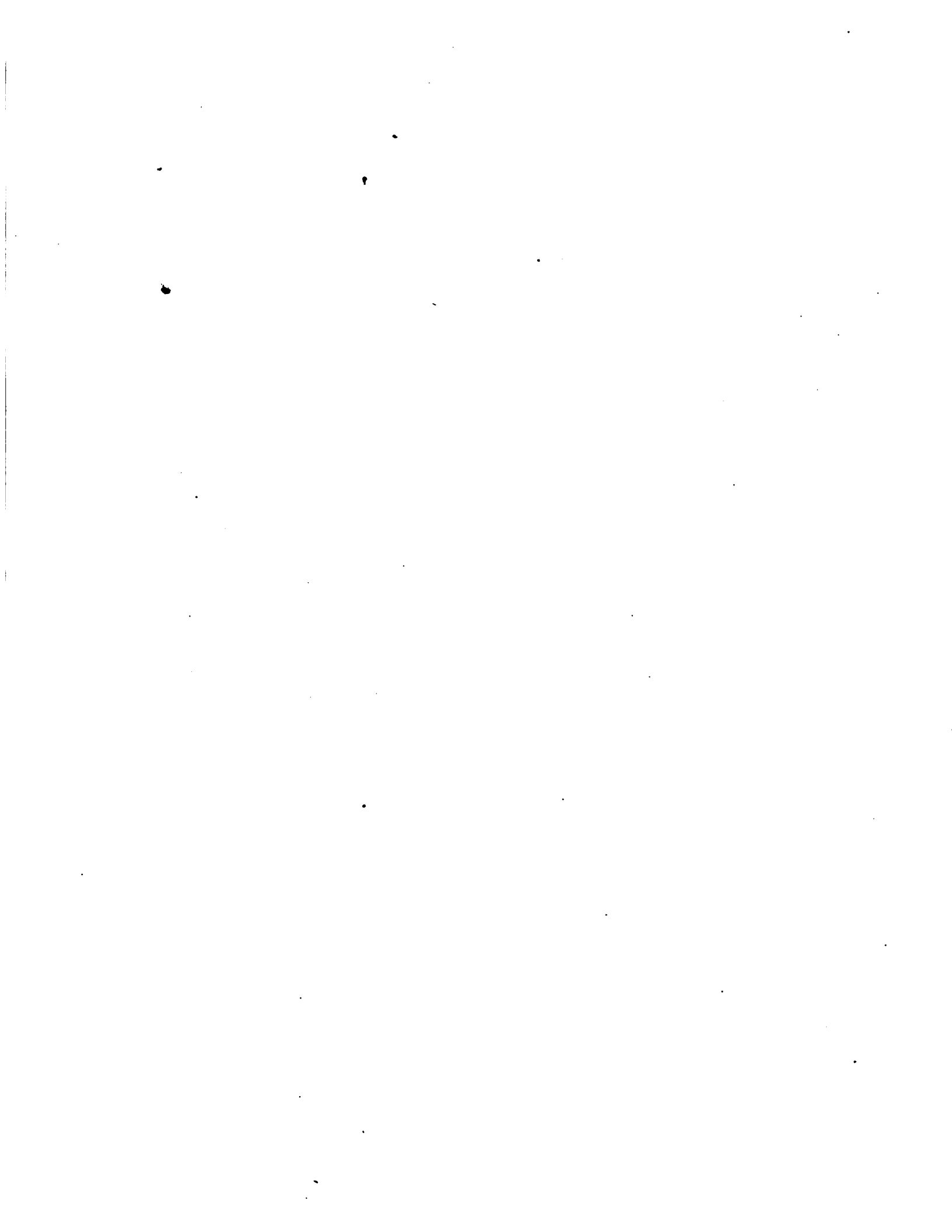
Encke's Comet as seen in the 9½-inch Equatorial on the nights of October 17, November 17, December 1, and December 2.



REPORT

OF

PROFESSOR ASAPH HALL, U. S. N.



REPORT OF PROFESSOR HALL, U. S. N.

UNITED STATES NAVAL OBSERVATORY,
Washington, January 15, 1872.

SIR: The motion of Encke's comet around the sun has given rise to many interesting investigations, and the results obtained are such as will doubtless lead, sooner or later, to a new and complete discussion of the observations, together with a new investigation of the theory of the comet. The following observations were made during the favorable return of the comet in 1871. They are divided into two parts. The first part consists of determinations of position, and in order to give a clear idea of the degree of accuracy attained, these observations are given in detail. The second part comprises the notes on the appearance of the comet in the telescope, and to these are added four drawings, made from sketches of the comet on October 17, November 17, and December 1 and 2. These drawings are intended to illustrate the changes of form that the comet underwent as it approached the sun.

§ 1.

The following observations of the position of the comet were made with the filar micrometer of the Equatorial of the Naval Observatory. The reticule of this micrometer consists of three parallel wires, with equatorial intervals of $12^{\circ}.4$, for observations of the difference of right ascension; and perpendicular to these are five parallel wires used for measuring differences of declination. The differences of right ascension were observed by means of a chronograph, the pen of which is worked by a sidereal clock. This clock is situated on the first floor of the Observatory, and for the sake of convenience, the time of the observation was taken from a sidereal chronometer, the second of which was compared with the clock on the chronograph-sheet, at the beginning and end of each observation. No attention is paid to the clock further than to keep its rate so small that the effect of the rate on the observed difference of right ascension is always insensible. In reading off the chronograph-sheet, the zero is assumed to be at the second of the clock nearest the zero second of the chronometer. This assumption introduces an error into the determination of the time of the observation, which will vary from $0^{\circ}.0$ to $0^{\circ}.5$; and, in the case of a comet or swiftly-moving body, a correction for the error of the zero is combined with the correction of the chronometer. The chronometer was compared on each night with the Kessels clock, the standard clock of the Observatory.

In what follows $\Delta\alpha$ and $\Delta\delta$ are the observed differences of right ascension and declination at the corresponding chronometer-time. The value of $\Delta\alpha$ is generally the