ECLIPSES, PAST AND FUTURE, WITH GENERAL HINTS FOR OBSERVING THE HEAVENS, SECOND EDITION

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S. J. JOHNSON

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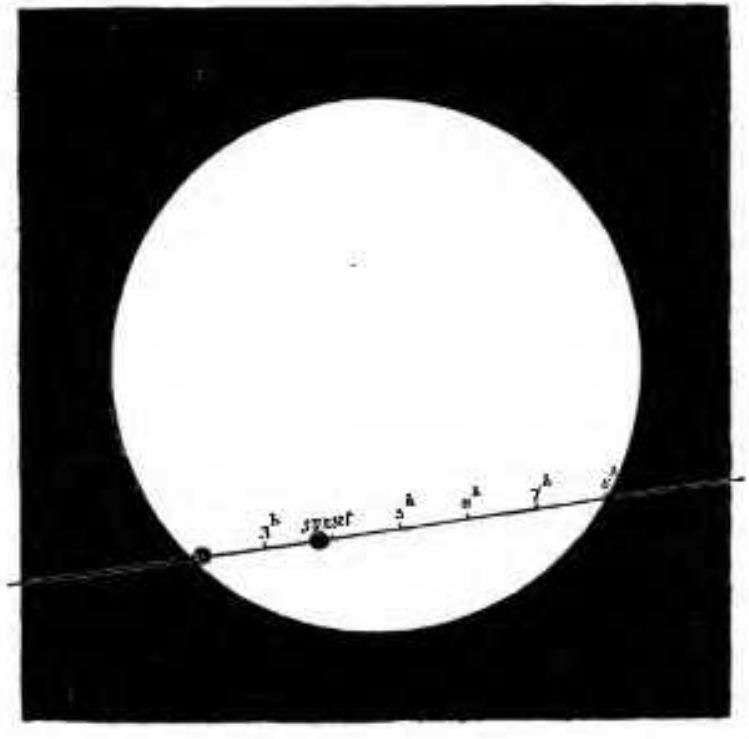

Transit of Venus, December 6, 1882, from ingress to sunset.
See pp. 86, 110.

ECLIPSES,

PAST AND FUTURE;

WITH

GENERAL HINTS FOR OBSERVING THE HEAVENS.

BY THE

REV. S. J. JOHNSON, M.A., F.R.A.S.

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PREFACE TO FIRST EDITION.

IT was originally my intention to bring out two works; one, a description of eclipses, past and future; the other, a cycle of celestial objects coming within the range of a 4-inch telescope, such an instrument being common with amateurs, and a very useful size, large enough to shew what is worth examining, and not too large to prevent portability. On after thoughts, my plan was to abridge both works, and publish them under the title of "Eclipses, Past and Future; with General Hints for Observing the Heavens."

With the solar eclipse of 1870 a considerable interest was kindled as to such phænomena, not a little correspondence passed on the subject in the scientific journals, and there were several inquiries about the next solar eclipse that would be total in this country. This led to certain communications to the "Times" by Mr. Hind in 1871 and 1872. In the first part of the following little work, notices of the eclipses are collected from the earliest days to the present time. A selection may be made from them by those who wish to compute from the tables of Leverrier and Hansen. All the eclipses in the "Saxon Chronicle"

are also stated, and the results of calculations I have made respecting them. No description of these eclipses seems, hitherto, to have been published. An account of the eclipses for the next forty years will be found, commencing on page 83, and of those of the sun for a long future period. The second part contains brief notes on the planets, meteorology, &c.; double-stars and nebulæ, within reach of small telescopes, such as many are possessed of, but use little, from disinclination to wade through Smyth's "Cycle," and similar long works. It is my hope that this little book may fall into the hands of such persons.

SAMUEL J. JOHNSON.

Upton-Helions Rectory,
Crediton, Devon,
January 19, 1874.

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INTRODUCTION.

INTRODUCTION.

THE word 'eclipse' is derived from the Greek ἔκλειψις, a failing or fainting, as the moon, when she got immersed in the earth's shadow, was imagined by many of the ancients to be swooning away. Perhaps there is nothing in astronomy that affords to the generality of mankind such ocular demonstration of the truth of the science, as the agreement of the prediction of an eclipse of the sun or moon with its appearance in the heavens, as to time, degree of obscuration, and other circumstances connected with the phænomenon. Although the earth and the other planets perform their respective periods round the sun in nearly equal times, yet, from the elliptical figures of their orbits, and their mutual attractions, their motions are far from being equable; and when these bodies are viewed from the earth, the inequality becomes still more apparent, as, in that case, they are sometimes direct, sometimes stationary, and at other times retrograde. But, as regards our satellite the moon, her nearness to the earth renders the inequalities of her orbit more apparent than those of any other heavenly body: she has, besides, a considerable parallax, which causes her place in the heavens, as seen from the surface of the earth, to be very different from that in her orbit, or when viewed from the centre of our globe. For these reasons, the computations of