



Opinion Article

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Foretelling a Solar Eclipse 2,600 Years Ago?

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Introduction

Could Thales of Miletus have predicted a Solar eclipse? Over the last century, there has been a controversy over how, 26 centuries ago, Thales could possibly have predicted a solar eclipse over the Lydian-Medes border. O. Neugebauer [1] even denied Thales could have made such a prediction! It is turned out that those researchers (including myself !) implicitly envisioned solar eclipses prediction as a sophisticated astronomical circulation based on the Saros cycle of 223 lunations and on the 54 years Exeligmos cycle. In 1995, at the *Congresso Internacional de Estudios Fenicios y Pùnicos* in Cadiz, I advocated [2] the hypothesis that, in Miletus, on -602.05.18, Thales would have observed the 50% magnitude morning eclipse, the Saros 57/-05 on the NASA catalogue [3]. Thales would then have predicted the Saros 57/-04 on the NASA catalogue, due to 223 lunaisons later, i.e: the "double sunset" on -584.05.28. Such a long term prediction de facto presupposed, in addition to the understanding of the Saros cycle, to keep a log book, a lunar calendar.

To solve the problem of 1 century up to 2 millennium *long term* retrodiction of ancient solar eclipses, i.e. to develop a tool for reliable astronomical predictions, an enormous know-how has been necessary. With the release in 2005 by Xavier Jubier of his

5MCSE [4], the 5 *Millennium Canon of Solar Eclipses*, a user-friendly freeware coupled to Google Earth, one can say that finally ancient solar eclipses retrodiction became a scientific discipline. The greatest benefit offered by 5MCSE is to allow to cross-check ancient observations against models for the slowing-down of Earth rotation, such as our Observed Ancient Solar Eclipses Database [5]. Nevertheless for Thales, he was just coping with a *short term* qualified guess !

For the problem of 1 hour to 18 months *short term* foretelling of Solar eclipses, the neurosurgeon W.H. Calvin [6] writes: **It is potentially quite easy, so long as you can be wrong half of the time.** The so-called **rule #1** is :

A solar eclipse may happened 6, 12 or 18 New Moons after a first solar eclipse.

This empirical rule has no scientific support, though over a given geographical area solar eclipses statistically have a tendency to cluster:

In 2002, at the *Colóquio Internacional, Astronomia, Educação e Cultura* in Luanda, (the follow-up of the observation mission of the 2001 Solar eclipse), I presented [7] the empirical rule #1 as a table of the dates of 18 New Moons [8] following the 2001 Solar eclipse:

Table 1 : Dates of the New Moons [8] following the 2001 Solar eclipse over Angola.

Year	1	2	3	4	5	6
+2001	VII.20	VIII.19	IX.17	X.16.	XI.15	XII.14.
+2002	I.13	II.12	III.14	IV.12	V.12	VI.10
+2002	VII.10	VIII.08	IX.07	X.06	XI.04	XII.04

As expected, the solar eclipse on the 18th New Moon of this table agreed with the prediction of 5MCSE ! Nevertheless I have been mentally unable to draw the same table for the Thales Solar eclipse. Twenty years later, disappointed by the lack of new ele-

ments to comfort my 1995 shaky hypothesis of a Thales aware of the SAROS cycle, I filled the New Moons table to apply the rule # 1 to this eclipse.

Table 2 : Dates of the 18 New Moons preceding the -584 Solar eclipse over Miletus.

Year	1	2	3	4	5	6
-586/-585	XII.14	I.13	II.11	III.12	IV.11	V.10
-585	VI.08	VII.08	VIII.06	IX.05	X.04	XI.03
-585/-584	XII.3	I.02	III.01	III.30	IV.29	V.28

Surprise: on the -586.12.14, thanks to Xavier Jubier "long term retrodiction freeware" one knows that there was a Magnitude 74%

Annular Solar Eclipse over Miletus!

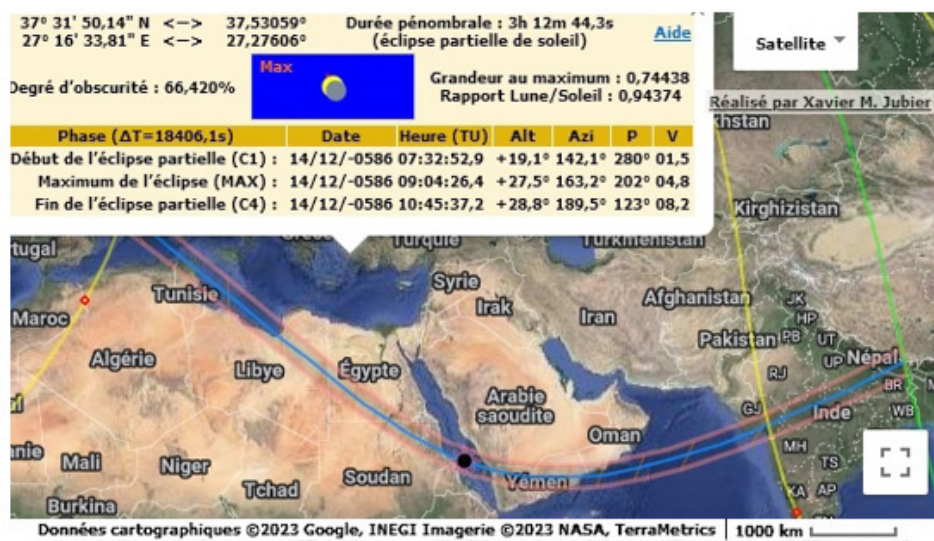


Figure 1: Retrodiction of the totality corridor of the -586.12.14 Solar eclipse.

Highlighted: observation parameters for Miletus (by fine weather!).

Conclusion

In a way, O. Neugebauer was right: the Miletian proto-astronomer Thales never predicted a solar eclipse ! Though, after having observed the partial annular eclipse on -586.12.14, and, as neither on New Moon-585.05.10 nor on New Moon -585.11.03 any Solar eclipse occurred, he made a qualified guess and boldly foretold to the king Alyattes the -584.05.28 Solar eclipse. This statistically possible event allowed the Lydian king to stage triumphally the end of his too long lasting war against the Medes [9].

Acknowledgement

None.

Conflict of Interest

No Conflict of Interest.

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