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Univ.-Prof. Dr. F. K. Dörner
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Dear Professor Dörner:

In reply to your letter of March 3, I am glad to tell you what I think about the "new" datings of the Antiochus "horoscope". Before considering, however, this specific case, I would like to make three general remarks.

a) You speak about "Berechnungen" which lead to certain planetary positions. But since we have Tuckerman's tables (1962) the dating of a horoscope presents exactly the same problem as finding a train in a timetable: one goes down the proper column (one for each planet) until one finds a date that gives the proper number of degrees (for "Leo" between $4 \cdot 30 = 120$ and $5 \cdot 30 = 150$ because Leo is the 5th zodiacal sign). Please look at the table which you sent me. [The small discrepancies in the positions originate from the fact that I had to compute by hand very laboriously all possibilities instead of reading them from highly accurate tables].

b) The desire of Mr. Crijs to determine the time from the position of the moon "auf die Minute genau" shows that he has not the faintest understanding of ancient astronomy. We know nothing about the methods and instruments of astronomical observations around 100 B.C.; equally nothing about methods of computations and their accuracy. [A planetary theory exists not before Ptolemy (150 A.D.) and he still allows errors of 10 minutes of arc, i.e. $1/3$ lunar diameter!].

c) "Die Berechnungen von Herrn Crijs" for the 2nd century B.C. are not new but identical with the date (a) on p. 15 in the book on Greek Horoscopes.

Since the date suggested by Mr. Crijs is not new, there remains only a return to our discussion on p. 15. To facilitate this discussion, I am sending you two simple tables. Table A gives the five planetary positions which are possible between about 120 B.C. and 0 (incidentally: no serious possibility exists until the death of Vespasian). * Table B compares these data with the coordinate systems possible at the time of the monument. "Constellation" means what most likely represents the boundaries of the constellation "Leo", not simply the interval of one zodiacal sign. Any red underlined planet is incorrectly located inside or outside "Leo", assuming that planets not shown on the monument should be "outside", but "inside" if shown.

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In Table B the "Hipparchus-Ptolemy" column seems very implausible, so soon after Hipparchus' time. The only historically likely situations are then the green cases. Obviously (c) is by far the most likely, containing the definition of "Leo" as constellation represented in the monument. Hence I would favor the date (c), but (a) remains a possibility. From a purely astronomical point of view, one cannot come to any more accurate solution.

Sincerely yours,

O. Neugebauer

ON:jb
Enclosures

	inside			outside	
	♂	♀	♂	♀	♂
(a) -108 Jul 15	♂ 11	♂ 14	♂ 16	♂ 12	♂ 4
(b) -97 Jul 16	♂ 25	♂ 16	♂ 17	♂ 20	♂ 15
(c) -61 Jul 7	♂ 6	♂ 8	♂ 9	♂ 25	♂ 13
(d) -61 Aug 4	♂ 16	♂ 11	♂ 26	♂ 8	♂ 15
(e) -48 Jul 13	♂ 17	♂ 16	♂ 7	♂ 18	♂ 23

A

Constellation	Endoxus		Babylonian A/B		Hipparchus/Ptolemy	
	inside	outside	inside	outside	inside	outside
II: ♀ 15 - ♂ 25 *	♂ 15 - ♂ 15		III: ♀ 20/22 - ♂ 20/22		IV: ♂	
(a) ♀ 4 ♀ 4	♂ 4 ♀ 4	♂ 4 ♀ 4	♂ 4 ♀ 4	♂ 4 ♀ 4	♂ 4 ♀ 4	♂ 4 ♀ 4
(b) ♀ 4 ♀ 4	♂ 4 ♀ 4	♂ 4 ♀ 4	♂ 4 ♀ 4	♂ 4 ♀ 4	♂ 4 ♀ 4	♂ 4 ♀ 4
(c) ♀ 4 ♀ 4	♂ 4 ♀ 4	♂ 4 ♀ 4	♂ 4 ♀ 4	♂ 4 ♀ 4	♂ 4 ♀ 4	♂ 4 ♀ 4
(d) ♀ 4 ♀ 4	♂ 4 ♀ 4	♂ 4 ♀ 4	♂ 4 ♀ 4	♂ 4 ♀ 4	♂ 4 ♀ 4	♂ 4 ♀ 4
(e) ♀ 4 ♀ 4	♂ 4 ♀ 4	♂ 4 ♀ 4	♂ 4 ♀ 4	♂ 4 ♀ 4	♂ 4 ♀ 4	♂ 4 ♀ 4

B