

3.2. Astronomical dating of ancient Egyptian horoscopes

We now turn to an analysis of the astronomical results of [2] of dating the zodiacal positions of the planets, which are described in certain historical sources, namely, the so-called horoscopes. Recall that all planets are placed near the ecliptic, relative to the stars (i.e., on the fixed astral sphere), and their position can be calculated similarly to the method of determining the dates of ancient eclipses. That is, we have to fix the positions of observable planets relative to the zodiacal constellations at some modern moment of time. Then, plotting integral multiples of the (known) sidereal periods of the planets backwards, we can, in principle, calculate horoscopes of the past, i.e., the position of the planets relative to the zodiac at a prescribed moment of time.

Thus, if a horoscope is described in some historical source, then, proceeding analogously with the procedure of calculating ancient eclipse dates, we may attempt to date it. To this end, we have to compare its description in a historical text with the calculated tabular horoscopes and attempt to find a horoscope with the same characteristics.

The seeming simplicity of this idea is made very complicated by the difficulties of the calculations and, which is most important, by various secondary reasons of "nonastronomical" character similar to those with which we are already familiar.

In [2], Morozov analyzed the traditional dates of all the basic horoscopes fixed in the surviving ancient sources. Omitting the details, we inform the reader that the result was the same forward shifts of their dates obtained astronomically as occurred previously in the case of ancient eclipses. We give a typical example.

The well-known Egyptologist W. Flinders Petrie in 1901 discovered in Upper Egypt (Athribis) an ancient Egyptian interment dated by the traditional chronology from the 1st century B.C. to the 1st century A.D. The interment was found to contain two graphic images of the planets on the zodiac. The two horoscopes probably indicated the dates of the two tombs. The specialist Knobel [7] attempted to date the horoscopes within the *a priori* time interval from the 1st century B.C. to the 1st century A.D. However, no exact astronomical solution was found. We make the precise statement that the *a priori* interval was determined, proceeding from the style and character of the inscriptions in the grave, due to which Knobel was forced to offer only quite approximate values, namely, A.D. 52 and 59. Knobel noted the imprecision, because the position of Venus at that time was different from its representation in the tombs.

Then the Russian astronomer M.A. Vilyev analyzed all the horoscopes from 500 B.C. to A.D. 600; however, he discovered no exact astronomical solution for the Athribis horoscopes. Nevertheless, the extension of the search time interval and the application of the formal astronomical dating method led *us* to the discovery of an exact astronomical solution.