A break-through research announced at the MELAMMUM VI Symposium of the Assyrian and the Babylonian Intellectual Heritage Project, Sep. 1st-3rd, 2008, Sofia, Bulgaria with forthcoming publication in early 2010 (Melammu VI Volume)

The most ancient layer of astronomical data in THE BABYLONIAN ASTROLABE DATED to 5,500 BC
The following is a press release by Placidus Research Center on occasion of the forthcoming publication of the research of Rumen Kolev, ‘Astronomical Dating of the Babylonian Astrolabe’ in the Proceedings of the Melammu VI Symposium of the Assyrian and the Babylonian Intellectual Heritage Project Sep. 1st-3rd, 2008, Sofia, Bulgaria. The publication is expected in early 2010. You may follow updated information on the official WEB Site of the Melammu Project:
http://www.aakkl.helsinki.fi/melammu/symposia/sypr6info.php

Astronomical data from 5,500 BC was found in a babylonian astronomical text known as the ‘Babylonian Astrolabe’. If confirmed, this may substantially change our understanding of history, astronomy and prehistory.

The discovery gives vision for a comparatively advanced astronomy in prehistoric Mesopotamia and may give the possibility to gain direct insight into its spiritual world.

**The 5,500 BC layer of astro info** was found in a number of texts\(^1\) from which the Astrolabe, known also as the ‘Calendar of the Creation’, is the most important.

In the Akkadian Creation epic, ‘Enuma Elish’, the Astrolabe is described as the calendar set in motion by Marduk himself when creating the Universe. The present discovery strongly suggests that the whole Astrolabe has been conceived around 5,500 BC.

**The Astrolabe is a ‘map’ of the sky.** It comes in circular and in list form\(^2\).

It shows which 3 stars/constellations rise heliacally (first appearance in morning after conjunction with the Sun) every month over the 3 sectors of the eastern horizon called ‘paths’.

The position of a star on the sky (over the eastern horizon) is revealed by its ‘path’.

Extremely important is to note that there is another group of texts, headed by the famous **MUL.APIN** which assign different paths to half of the stars in the Astrolabe. This turned out to be a crucial evidence in the analysis because it allowed us to correlate another section of the precessional path-changes of the stars to another text!

On the technical side of the matter, the celestial paths and the path-positions of the stars can be computed, more or less exactly, astronomically. This gives us the possibility to analyse mathematically and date any text that assigns paths to stars as the Astrolabe, Mul Apin and so on.

In the last hundred years, some scholars in Babylonian astronomy repeatedly expressed the view that the stars in the Astrolabe are not in their ‘correct’ celestial paths (Kugler, Schaumberger, van der Waerden).

Their big error was that they made computations only for the period 2,000 BC - 1,000 BC.....

This is not so surprising when we take in account that these researchers worked before the computers and had to make thousands of tedious computations with spherical trigonometry.

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\(^1\): The tablets date from the Kassite (HS 1897), Middle Assyrian (VAT 9416) and Late Babylonian period (LBAT 1499, BM 82923). These texts are from 2 groups: in one group are the ‘Astrolabe’ texts (VAT 9416, LBAT 1499, BM 82923) spanning 1100 BC to 100 BC and in the other group are the ‘30-stars List’ texts (HS 1897) from around 1400 BC.

\(^2\): The first piece of the riddle came when the pioneer assyriologist George Smith found a small piece with the names of 4 stars in 1874. Rassam, Pinches and Zimmern later found more parts and better preserved copies. The oldest and best preserved list Astrolabe was examined by Ernst Weidner in 1913 and published almost in a complete translation in German in 1915. It is known since as astrolabe ‘B’ (from Berlin) which belonged to the Assyrian king Tiglatpilesar (1114 BC - 1075 BC). The tablet is in the Berlin museum.
One of the amazing things in the story is that the Babylonian Astrolabe has laid around for more than 100 years (30 of which are well in the computer age) and no-one ever tried to do a most simple check ....... **check for the time-frame when the text made astronomical sense...**

It all started one July evening in 2005 when I, still in Seattle, in the library of the University of Washington stumbled per chance on an article about the Astrolabe by the famous mathematician and history of science scholar van der Waerden (JNES 8, 1949).

After thoroughly examining his work, I decided to check manually if the Pleiades have ever been in their ‘correct’ astrolabe path. I was using a simple Planetarium program (my own computer program Babylington 1)

What I did was to check with the program the path position of the Pleiades in a full precessional cycle, starting from 1,000 BC and moving back in time with a step of 500 years.

I worked with both theories of the paths- the azimuthal of Pingree-Reiner and the declinational of Kopff. **The result was confusing.** The Pleiades turned out to be in their correct southern path of Ea only in the period 12,000 BC - 4,800 BC!

Then I repeated the same procedure on **8 bright stars with certain identifications.**

**The result was more than shocking.** The time frame when all 8 bright stars were in their Astrolabe paths turned out to be between **9,500 BC and 5,200 BC**!

A most astonishing thing was to see on the graphs computed with the program how, when moving forward in time, the stars change their declination and path until we come to one moment in-around 3,600 BC when already 6 of the 8 bright stars have ‘moved out’ of their Astrolabe-paths and ‘moved in’ into their Mul Apin paths!

No-one would have expected such a result. Even a writer of fantasy books!

Staggered, I left the research for several months. Then I was back.

In order to expand my analysis I spent several months feverishly writing a special computer program that would allow me to check all kinds of different situations: different star-identifications, different path theories, different latitudes of observation, different sets of stars analyzed and different extinctions of the atmosphere...

Then I set to examine the model of the Astrolabe changing all described variables and watching how this would change the time-period of the best fit ...

**All results were pointing to the same time period:**

**5,500 BC +/-500.**

The model was robust and statistically significant.

**This was something impossible, yet happenning!**

On the picture at right: piece of a circular Astrolabe from the New-Assyrian Empire in the British Museum.

photo: courtesy of Florentina Geller.
But how can we explain the fact that the majority of the stars from the Babylonian Astrolabe are in their ‘correct’ paths in-around 5,500 BC?

We have several options:

I. The result is by chance;
II. Someone who knew about the precession in-around 1500 BC or before, made-up the Astrolabe with positions of the stars as in 5,500 BC;
III. The path positions of the stars in the Astrolabe have been observed and determined around 5,500 BC.
IV. Not only the path positions of the stars in the Astrolabe but also the complete Astrolabe, as a calendar with 12 months and 3 stars heliacally appearing in each month, was conceived around 5,500 BC.

I  The probability of the first hypothesis happening can be calculated and I do it in my paper. It is one in several millions.
II  The second possibility (the ‘conspirational’ theory) has been aired as a conjecture by some scholars in the discussion after the lecture and in private. I do not consider this a serious option.

The fact that very strongly goes against the ‘conspirational’ theory is that there are several different layers of astronomical data in the astrolabes.

There are 2, 3 and eventually even 4 layers coming from in-between 5,500 BC and 700 BC! This means that new data has been added several times in the course of long transmission.

These layers of astronomical data are like the layers in a sea-floor sediment. They come from different eras. The astronomical equivalent of a ‘stratigraphical analysis’ of the astrolabe texts is attempted in the forthcoming article and a more detailed research of the layers is being done in the moment (Nov. 2009).
The third hypothesis is true several millions to one and I have strong arguments to claim that not only the path-positions of the stars in the Astrolabe are coming from 5,500 BC, but the complete Astrolabe!

Because the babylonian celestial ‘paths’ depend on and are a function of the way of division of the seasonal year.

The Sun must spend equal time in the northern and the southern paths and double that in the central path of the horizon (going trough the two equinoctia). This requires a division of the seasonal year in a number of time intervals divisible by 4 id est: 4, 8, 12, 16....

We should remember also that Mul.Apin and Enuma Elish describe division of the year in 12 and that the number of months in the lunar year is 12 or 13.

All these considerations, I believe, give considerable weight to the theory that the Astrolabe was conceived in 5,500 BC.

The Astrolabe dated to 5,500 BC, without doubt, may open up for us a New World- the world of a prehistoric civilization with astronomical knowledge on comparatively high level...

If we now jump in mythology, the 5,500 BC point in time can easily refer to the prediluvial prophet of Star Knowledge and Divination En Meduranki. The Astrolabe then must come from the First Age- 5,500 BC- the time of foundation of the civilizations of Sumer (the first temple in Eridu) and Vincha (the first settlements and cities along Danube) that coincides with advanced agriculture using irrigation and humid and warm climate- the very onset of what later probably came to be considered as ‘the Golden Age’: 5,500 BC to 3,600 BC.

Have we ‘captured’ with the magic of mathematics what was until now “only a ‘myth’ “ ?!

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Rumen Kolev and Rumen Kolev Junior, July 2007

Simo Parpola and Rumen Kolev in discussion at the Melammu VI Symposium in Sofia, Bulgaria, New Bulgarian University, 3rd of Sep., 2008