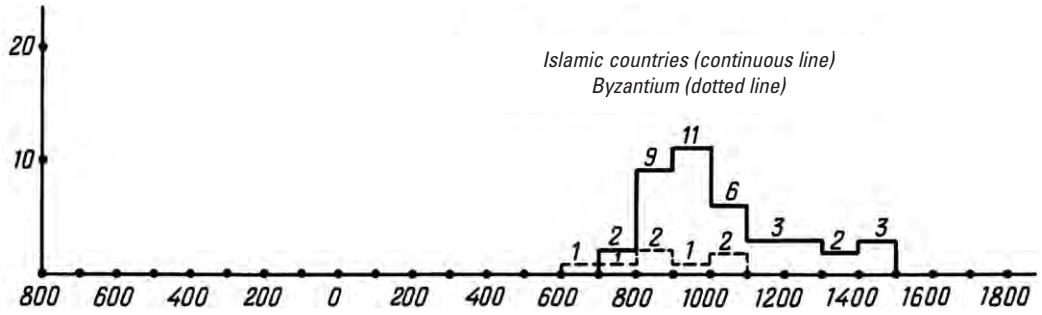

Fig. 11.20. Islamic and Byzantine astronomers as distributed across the "Scaligerian time axis".

and age. No strange "declines" or secondary "surges", and no "sine curves", either.

We discover good concurrence between the end result and our corollaries, which were based on altogether different methods, qv in CHRON1 and CHRON2. We discover it time and again that the correct chronology begins around the XIII-XIV century A.D. Events dated to epochs earlier than XI century A.D. today are phantoms, which goes to say that they reflect real but much more recent (mediaeval) events. Duplicates of XIII-XIV century events were misdated to distant past, which has spawned all those "grandiose ancient surges" in astronomy, art, military science and culture in general interspersed by "glum centuries of decline".

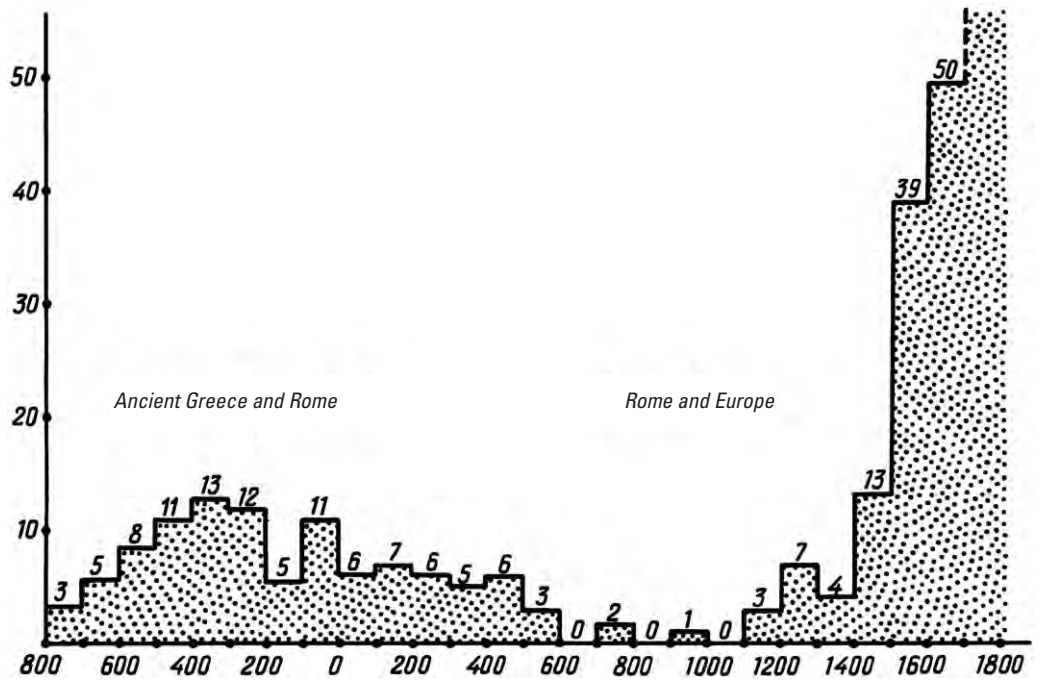

Fig. 11.21. A generalised graph that reflects the "evolution of astronomy" according to the Scaligerian chronology. The "ancient" peak is perfectly obvious, as well as the ensuing "dark ages of stagnation". It is just starting with the XIII-XIV century A.D. that we see astronomy to develop rapidly and evenly, with no drastic peaks.

6.6. Corollaries

1) Scaligerian history of astronomy tells us of a rather odd event – an intense "build-up" of the "ancient" astronomy followed by millenarian decline, then another surge and steady growth ever since the XIII century A.D.

2) Scaligerian history tries to convince us that nearly all the primary accomplishments of mediaeval astronomy of the XIV-XVI century A.D. were "already discovered" more than 1000 years earlier, in the so-called "ancient" period, and then mysteriously forgotten for many centuries.

3) Let us list some primary astronomical ideas, allegedly discovered by the "ancient" astronomers ages ago and then "rediscovered" in the XI-XVII century A.D. after many years of oblivion.

a) Ecliptic and equatorial coordinates, conversion methods.

b) Estimation of the primary elements of the theory of planetary motion for Solar System.

c) The heliocentric planetary system theory.

d) The estimation of distances in the Sun – Earth – Moon – planets – stars system.

e) Prediction of lunar eclipses.

f) Compilation of star catalogues.

g) Construction of cosmospheres.

h) The discovery of precession.

i) Professional astronomical instruments: the astrolabe etc.

j) The calculation of the sidereal year and the calculation of the equinoctial year.

k) The definition of constellations and the fixation of their "patterns".

l) The issue of proper star motion.

We leave aside the fact that, according to Scaligerite historians, in the "ancient" China of the alleged year 1100 B.C. (a great deal earlier than the "ancient astronomical boom" in Greece) Chu Kong, a Chinese astronomer, measured the length of the gnomon shadow during the summer and winter solstice, estimating the angle between the ecliptic and the equinoctial with the flabbergasting precision of 23° 54' 02" ([395], page 8). As we are beginning to understand, the event in question is a phantom reflection of some real astronomical experiment that took place in the epoch of the XVI-XVII century.

Without insisting on any finite conclusion, we cannot help noticing that the above facts strike one as very odd indeed. One must however be aware that all such oddities owe their existence to the Scaligerian version of history. Once it is abandoned, with all the chronological shifts taken into account, we be left with a perfectly natural and comprehensible picture of astronomy's development, from the XIII-XIV century A.D. onwards. The astronomical discoveries as listed above appear to have been made in the epoch of the XII-XVII century, with their duplicates cast deep into the past by the erroneous Scaligerian chronology. In reality, there were no substantial "regresses" in the history of science and culture.

7. COPERNICUS, TYCHO BRAHE AND KEPLER. THE RELATION BETWEEN JOHANNES KEPLER AND THE FINAL VERSION OF THE COPERNICAN OEUVRE

7.1. What we know about Copernicus and his astronomical endeavours. Was the heliocentric cosmological system indeed discovered in the first half of the XVI century and not any later?

Copernicus is believed to have lived in the XV-XVI century, in 1473-1543 ([395], page 99). It is further believed that the dates of Tycho Brahe's life are 1546-1601, whereas Kepler, Brahe's apprentice, lived in 1571-1630. That is, according to Scaligerian history, these astronomers constitute the following sequence: Copernicus, Brahe and Kepler.

In figs. 11.22 and 11.23 we reproduce two ancient portraits of Copernicus, known to us today as a great astronomer. It is difficult to say whether the portraits depict the same person or not. Incidentally, the first one portrays Copernicus as a doctor – not an astronomer! According to the specialists in the history of sciences, "one of the portraits depicts Copernicus holding a lily-of-the-valley – an emblem of the medical profession" ([44], pages 80-81). Another version of the portrait also depicts Copernicus holding a lily of the valley – a doctor yet again, qv in fig. 11.24. There are, of course, portraits of Copernicus that emphasise his astronomical affiliation – all of them of a more recent origin than the old portrait in fig. 11.22.

Fig. 11.22. Ancient portrait of Copernicus holding a lily of the valley. This is how one drew doctors, not astronomers. The original portrait is kept in the Copernicus Museum, Frauenburg. Taken from [44], inset between pages 12 and 13.

Fig. 11.23. Ancient portrait of Copernicus. The original is kept in the National Library, Paris. Taken from [44], inset between pages 160 and 161.

However, even this portrait must have been created relatively recently.

Specialists in the history of sciences have noted this somewhat strange fact a long time ago. Having pondered it, they suggested the following explanation: "the Aesculapian art of Copernicus was valued so high that the artist must have received recommendations to portray the venerable canon and learned astronomer holding a lily-of-the-valley" ([44], page 81). This might be true – however, we haven't managed to find any ancient portraits of such famous astronomers as Claudius Ptolemy, Tycho Brahe or Johannes Kepler with symbols referring to some other profession. After all, despite Tycho Brahe's famous passion for the manufacture of instruments and globes, nobody drew him apron-clad and wielding a lathe tool. There aren't any portraits of Kepler with a brush and a palette, either. Ptolemy was also portrayed as an astronomer exclusively in all the ancient sources (see fig. 12.25). Therefore, the case of Copernicus is strangely conspicuous if we regard the mediaeval astronomers en masse.

Could this mean that in the XV-XVI century the primary occupation of Copernicus was actually medicine? His active interest in astronomy may have been ascribed to him much later, in the XVII century, during the construction of the "XVI century history of astronomical sciences", likewise one of the greatest astronomical discoveries.

There is some reason to enquire about this. Indeed, let us point out the following circumstance, which is

Fig. 11.24. Copernicus holding a lily of the valley in his hands – a symbol of the guild of medics. Taken from [926], page 54.

Fig. 11.25. Ancient drawing of Ptolemy accompanied by Astronomia and Urania. An engraving from a Venetian edition of Sacrobosco's ***Universal Sphere***, allegedly dated to 1490. Taken from [98], page 42.

of great importance. Apparently, "unfortunately, his [Copernicus's – Auth.] oldest biographies already date from the XVII century; we shall mention two of their lot – the book of Simon Starowolski and that of Pierre Gassendi" ([44], page 8). See also Gassendi's book ([1152]). This means that the first biographies of Copernicus were written in the epoch of Johannes Kepler the earliest. Moreover, "even the year of his birth remains dubious to date. Most biographers accept 19 February (old style) 1473 as the most likely date. It is based on the testimony of Michael Maestlin, Kepler's teacher" ([44], page 8).

However, a more in-depth acquaintance with "Maestlin's testimony" reveals the following circumstance, which is rather odd. Apparently, "Maestlin reports that Copernicus was born on 19 February 1473, at 4:48 PM" ([44], page 8). It has to be borne in mind that the minute hand did not yet exist on XV century clocks. Modern biographers of Copernicus usually modestly omit the "precise birth date", in full awareness that "4:48 PM" is a fancy of Maestlin. Nevertheless, it is presumed that he did know the exact date. We doubt this – after all, it is reported that the first biographies of Copernicus were created in the XVII century and not any earlier – therefore, fantasy is very likely to be their primary element (or, alternatively, the astronomical calculations of the XVII century when the "precise birth date" of the great Copernicus could be "calculated backwards from the positions of the stars". Bear in mind that Johannes Kepler was a "very prolific and enthusiastic astrologist, who had studied under Maestlin" ([926], [395] and [44]).

Let us mark the fact that the first "biographies of Copernicus" were written by none other than Kepler's teacher.

One must admit that some of the modern specialists in the history of science are well aware of the vagueness of "Maestlin's testimony", likewise other reports made by the first biographers of Copernicus in the XVII century. It is honestly stated that "we know nothing about the great astronomer's childhood – no verbal information from that epoch of his life has survived anywhere" ([44], page 8). Therefore, inspired references to "4:48 PM" are obviously a literary fantasy of literary-minded scientists of Kepler's epoch, or manifestations of astrological cabbalism characteristic for the very same epoch of the XVII century.

Specialists in the history of science report that the main "visible" activities of Copernicus were those of a doctor, canon and administrator. These three words constitute the name of one of the book's chapters ([44], page 39). There is no mention of astronomy. It is pointed out that "Copernicus was de facto performing a bishop's duties … remaining in charge of the parish for half a year" ([44], page 76). Moreover, "in 1520 Copernicus finds himself governor of Holstein, where he has to solve the problem of protecting the city from the raids of the militant Teutonic Order" ([926], page 56).

Nowadays we are told that Copernicus was an undercover astronomer who never advertised so much as his astronomical inclinations, let alone his great dis-

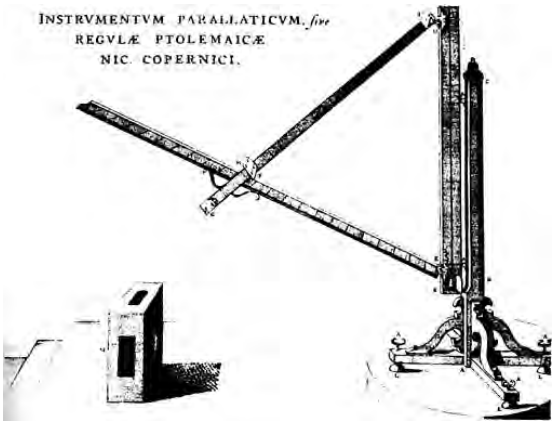

Fig. 11.26. "Triquetrum – the instrument that Nicholas Copernicus had used for observations" ([926], page 55). Made of fir wood. The authors are trying to convince us that Copernicus had made his great astronomical discovery with the aid of this primitive wooden instrument. Taken from [926], page 55.

Fig. 11.27. An old portrait of the "ancient" Ptolemy, who is holding a wooden instrument in his hand. We recognize the instrument as identical to the Copernican "triquetrum". Taken from [98], page 8. Another version of the same engraving (the "second original"?) was already cited above, in fig. 0.1.

covery. This is what we learn: "He kept his manuscript secret from everyone … Copernicus never shared his plans with anyone; his work was wholly undercover, and even his uncle knew nothing of the revolution in astronomy prepared by his genius nephew" ([44], pages 41-42).

The preparation of the book of Copernicus is described as follows today: "Already by 1509 Copernicus was known as a bold reformer of astronomy, albeit to a rather limited group of people. Few must have been aware of him – one must think that nobody suspected the existence of a voluminous tractate authored by Copernicus and already finished as a draft by that time" ([44], page 47).

Let us agree with the Scaligerite biographers of Copernicus for a moment and assume that his astronomical activities remained secretive all his life for one reason or another. Apparently, any astronomer of this calibre, someone who made a discovery this great, must have carried on his observations for many a year. One must ask the following question: what instruments did he use? For instance, Ptolemy describes a variety of astronomical instruments in the Almagest at a great length – all of them complex and rather expensive. Tycho Brahe had a passion for creating unique new astronomical devices, and launched a whole industry of professional craftsmen (quite impossible without state support due to its sheer price). One would assume that Copernicus did something similar. However, Scaligerian history tells us different, painting a rather odd picture in this case as well.

We quote: "Large-scale calculations were required, which would invariably have to be based on a certain amount of new observations. Astronomical instruments were obviously necessary for the latter to be feasible. Nicolaus Copernicus neither had the instruments, nor any opportunity to have them ordered. Therefore, he opted for making them all by himself. He decided against complex instruments, such as were used by Walther and Schoner, the Nuremberg astronomers, lacking a mechanic's workshop…

Copernicus made a quadrant for the observations of the Sun's meridian height during summer and winter solstice. However, he used this device rather occasionally. For the most part, he used another portable instrument – one known as "triquetrum", or "parallax instrument". This simple tool is also occasionally referred to as "Ptolemy's rulers". Copernicus made it himself, "rather accurately, of fir wood" ([44], page 54).

We reproduce an ancient drawing of this primary instrument used by Copernicus in fig. 11.26. It is so primitive that one cannot help doubting that Copernicus, a doctor, canon, administrator and governor,

could use two fir-wood planks to make a major astronomical discovery in between other endeavours. Specialists in the history of astronomy are apparently aware of some oddity here, which is why voice such sentiments as: "Crude as this instrument may seem at a first glance …" ([44], page 56).

It is most significant that the "ancient" Ptolemy was portrayed with the same two planks in the Middle Ages, qv in fig. 11.27. Could this astronomical instrument have remained unaltered for fifteen hundred years – the period that is presumed to separate Ptolemy from Copernicus? The artwork in question, however, leaves one with the impression that Ptolemy and Copernicus were contemporaries and used pretty much the same instruments.

Let us carry on. It is said that the observations that support the discovery of Copernicus were made in Frauenburg. However, we learn that "in general, Frauenburg was a very inconvenient place for astronomical observations. This is due to the geographical latitude of Frauenburg, which equals 54° 22' and complicates the observation of planets. Moreover, the view was further obscured by the frequent fogs rising from the sea, as well as the general abundance of clouds in these latitudes … However, Copernicus did not strive for great precision in his observations … According to the evidence of his apprentice and avid fan, Rheticus … he frequently said that he would … be happy if he could bring the error margin of his observations into the confines of 10' (10 arc minutes)". Whenever Rheticus would begin to argue and claim that one must make every effort to be as precise as possible, Copernicus pointed out the impossibility of this endeavour as well as the amount of labour required, warning his apprentice against 'ruminations of dubitable veracity' based on a priori imprecise observations" ([44], page 57).

This sounds reasonable and obvious, if we are to consider that Copernicus indeed lived at the very dawn of the epoch of astronomy in the modern meaning of the word – a science that employs an array of more or less precise instruments. According to our reconstruction, the time in question is when the primary materials for the final version of Ptolemy's Almagest were still being accumulated. The precise instruments of the mediaeval Ptolemy and Tycho Brahe either didn't exist, or were just being created in the XV-XVI century. It could be that the discovery eventually ascribed to Copernicus was made later, at the end of the XVI or even at the beginning of the XVII century, by which time the level of astronomical instruments grew substantially, and they were by no means made of cheap fir-wood planks.

But let us come back to the primary instrument of Copernicus – the one that was made of little planks of wood. It was "kept as a precious relic in Frauenburg for forty years after the death of the famous astronomer … Johann-Hanovius, Warmian Bishop, sent … the parallax instrument of Copernicus to Tycho Brahe as a present. The latter was delighted to receive this present, being a fan of Copernicus, although he had rejected his heliocentric system" ([44], pages 58-59). But in this case we are perfectly justified to ask whether the Copernican cosmology in its fully-fledged form was at all known in the epoch of Tycho Brahe. Could it be that the latter's reluctance to acknowledge the Copernican system should be explained by the simple fact that it did not exist in its final form. Brahe was forced to create a cosmology of his own as an attempt to develop Ptolemy's model. Tycho Brahe may have respected his predecessor Copernicus for astronomical merits of some sort, but hardly those ascribed to him today. We shall come back to this issue later.

Another oddity is as follows. Apparently, "no letters of Copernicus have survived – either those he sent to other scientists or the ones the scientists in question sent him in order to discuss his heliocentric cosmology" ([44], page 84). So let us reiterate. Could it be that the heliocentric system was finally formulated later than the first half of the XVI century – the end of the XVI century, for instance, or the beginning of the XVII? This could explain the absence of related correspondence in the first half of the XVI century.

7.2. Oddities in the Scaligerian story of how the book of Copernicus was published

We are told the following today: "Copernicus related his theory in two works. The first, "Lesser Commentary", was a small (12-page) essay – never printed and only distributed as handwritten copies. It was mentioned by Tycho Brahe; the manuscript itself was only discovered around the end of the XIX century [sic! – Auth.] in the book archives of Vienna (1877)

and Stockholm (1881). The main work of Copernicus entitled "On the Revolutions of Celestial Spheres" was published in 1543. A special courier brought several copies of the book to Copernicus, mortally ill at 70, on the very day of his death, on 24 May 1543" ([395], page 101).

Specialists in the history of astronomy tell us the following: "The issue of the date of the 'Lesser Commentary's' creation remains poignant to date" ([395], page 101). Also: "It was presumed lost; only by good fortune have two handwritten copies been found, one in the Library of Vienna, and the other – in the library of Stockholm Observatory" ([44], page 85).

Thus, the "Lesser Commentary", currently ascribed to Copernicus, a scientist of the XV-XVI century, has only been known since the end of the XIX century. We haven't managed to find any reliable data in works that mention him that predate the XIX century. It could have been written in the XVIII or XIX century by some astronomer as a brief rendition of the known main oeuvre of Copernicus. Therefore, one shouldn't base any hypotheses about the discovery of the heliocentric cosmology in the first half of the faraway XVI century on the "Lesser Commentary".

Figs. 11.28 and 11.29 reproduce the photograph of the beginning of "*De revolutionibus orbium coelestium*" as a manuscript. It is believed to be an autograph of Copernicus ([44], pages 12-13). However, it looks rather odd for a XVI century text. It is easy to read, the sentences are divided into individual words etc (see fig. 11.29). Could it be of a later origin, perhaps? We shall discuss the appearance of the authentic old texts of the XVI century at length in Chron4.

In fig. 11.30 we see the title page of the first printed book of Copernicus – "*De revolutionibus orbium coelestium*", allegedly dating from 1543 ([44], pages 144-145). However, the publication date is transcribed as M. D. XLIII. The first Romanic letters (M and D) are separated from the rest by dots, qv in fig. 11.31. As we have explained in detail in Chron1, Chapter 6:13, such dates can be interpreted in a variety of substantially different methods – for instance, as "43 years since the enthronement of the Great House" (Magnus Domus, or M. D.). The identity of the house in question (the beginning of a royal reign) shall be an altogether different question, with a variety of possible answers. Therefore, one must be extremely cautious

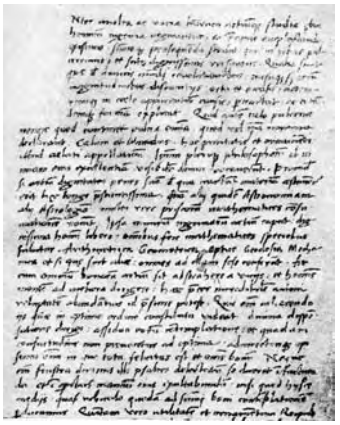

Fig. 11.28. The beginning of the manuscript entitled ***On the Rotation of the Celestial Circles*** ascribed to Copernicus nowadays. The original is kept in the Copernican Museum in Frauenburg. Taken from [44], inset between pages 12 and 13.

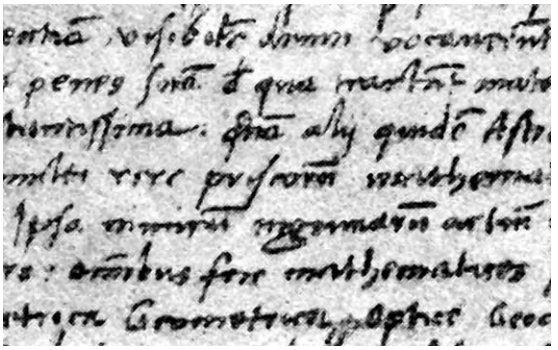

Fig. 11.29. A close-in with a fragment of the Copernican manuscript. Taken from [44], inset between pages 12 and 13.

when one claims the date in question to be 1543 A.D. A different interpretation might yield a date pertaining to the beginning of the XVII century. See Chron1, Chapter 6.

Why is Copernicus believed to have vehemently opposed the publication of his discovery all his life, getting a copy of the book on his dying day? Specialists in history of astronomy have long noted this rather strange "Copernican reticence", proposing a variety of theories to explain it. This, for example, is what I. A. Klimishin has to say on the subject: "Copernicus appears to have finished work on his oeuvre entitled '*De revolutionibus orbium coelestium*' in 1532.

Fig. 11.30. Title page from the book of Copernicus, ***On the Rotation of the Solar Circles.*** Presumed published in 1543. However, the date M. D. XLIII that we encounter here can be interpreted in a variety of ways. Taken from [44], inset between pages 144 and 145.

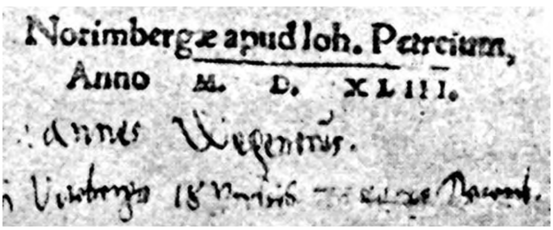

Fig. 11.31. A close-in with the date on the title page of the Copernican book. Taken from [44], inset between pages 144 and 145.

He only published it eleven years later, after persistent persuasion from the part of his friends and avid supporters. Why would that be? Some voice the presumption that Copernicus was afraid of the church persecuting him. Others suggest that he was a very modest man and did not want his name to become too famous. However, we have already witnessed the fact that all his de facto ecclesiastical superiors were urging the publishers to launch the book into publication as soon as possible. The persecutions only started a century later" ([394], page 104).

The answer might be as follows. Modesty has got nothing to do with it. It is likely that the final version of the Copernican oeuvre was only written in the early XVII century – or even the original version, come to think of it, which is when the socio-political and ecclesiastical dissent in Western Europe reached its peak. It would indeed be dangerous to publish the final heliocentric conception in such an environment. This is why the editors of the book (or its real authors - from the clique of Johannes Kepler, for example) did the perfectly sane thing – they did publish the book, but ascribed it to an astronomer who died more than fifty years ago – Copernicus, the doctor, canon and administrator who may indeed have been the first to have voiced the inspired, but yet rather vague and half-formed, conceptions of the heliocentric system.

Hence the legend that Copernicus never saw his book published – namely, that it was placed into his chilling hands on the day of his death. "Gassendi, the first biographer of Copernicus [a XVII century author, as we feel obliged to remind the reader – Auth.], tells us the following about the last days of the astronomer: 'The time of his last ailment almost coincides with the publication of his magnum opus … Several hours before his death, a copy of his freshly printed work was brought to him … He took the book into his hands and stared at it, but his thoughts were already far away'. Repercussions of this story told by Gassendi can be found in virtually every subsequent biography of Copernicus" ([44], page 109).

The very structure of this book's first version strikes one as most bizarre indeed. For one, it has a lengthy title that amounts to some 13 lines of modern text ([44], page 149). However, we are told that "the only part of this sophisticated and advertisement-like title that was really authored by Copernicus can be reduced to 'On the Revolutions of Celestial Circles, VI books'. The rest was written by Osiander" ([44], pages 149-150). And so, we are suddenly introduced to Osiander, some mysterious co-author and the alleged editor of the book. Incidentally, the name itself might translate along the lines of "Asian Man", or "Man of Jesus", which makes it a likely moniker, especially given that it is nearly "symmetrical" to his name Andrew, and looks very much like an example of typical Mediaeval cabbalist wordplay. Andreas Osiander is presumed to have lived in 1498-1552 ([926], page 59).

Furthermore: "Osiander didn't restrict himself to these two insets on the title page. He has also written a foreword, which distorted the very spirit of the Copernican oeuvre. Since this foreword remained un-

signed for a while, many attributed it to Copernicus and remained errant for a long time" ([44], pages 149-150). I. A. Klimishin writes the following: "Lies nest on the very first pages of the Copernican oeuvre, disguised as a foreword by Andreas Osiander, a Lutheran theologian (1498-1552) charged with the editing of the book" ([395], page 114). Let us remind the reader that Copernicus was a Catholic; moreover, not any mere Catholic, but one vested with the duties of a bishop ([44], page 76). Therefore, it strikes one as highly improbable that he would trust a Lutheran theologian with the editorship or even the foreword. After all, we are told that the relations between Catholics and Lutherans were extremely strained in the XVI. However, Kepler was a Protestant, and we would be perfectly justified to expect a foreword by a Lutheran theologian in a book whose publication he took part in, qv below.

It is presumed that certain friends of Copernicus protested against the publication of a book with such a foreword, but to no avail, since the Copernican magnum opus "was already widely sold" ([44], page 150). Let us also pay attention to the following piece of information: "The foreword written by Copernicus himself could only be published 300 years later" ([926], page 59).

Aren't these vague legends concerning the publication of the book a reflection of the editing that continued well into the XVII century? After all, we are told that "1000 copies of the book by Copernicus were printed in 1543; new publications took place in 1566 (Basel) and 1617 (Amsterdam)" ([395], page 113). One must mark straight away that the "new edition of 1617" already dates from the epoch of Johannes Kepler. Therefore, taking all the above oddities into account, one has got every right to ask the following question: is it true that the "previous editions" really date from 1543 and 1566, and not any later date? We have already debated that such dates as M. D. XLIII may be interpreted in a variety of ways.

Moreover, we prove it in CHRON1, Chapter 6:13.5 that the publication dates of certain printed books dating from the XVI-XVII century may be in need of being brought closer to our time chronologically, by fifty years at least. The result might be that the date of the first publication of the Copernican oeuvre shall be circa 1593 and not 1543, as it is believed today – once again, the epoch of Kepler.

Our opponents might counter as follows: weren't the "Prussian Tables of Celestial Motion", presumably compiled on the basis of the Copernican theory, published in the alleged year 1551, as it is believed today ([395], page 104)? New editions of the tables came out in the alleged years 1571 and 1584; they "became the basis for the calendar reform instigated by Pope Gregory XIII in 1582 – also known as the introduction of the 'new style'" ([395], page 104). Our reply shall be identical to the above reply to the question about the Copernican book. The time of the calendar reforms falls over the end of the XVI century, some 50 years later than the alleged first publication of the book of Copernicus. The Prussian tables were compiled in the alleged years 1571 and 1584, and also require additional analysis. It is possible that the text of the Tables that has reached our time actually dates from a later epoch. Moreover, the calendar reform of 1582 may well have been carried out without the heliocentric cosmology. All the theoretical calculations necessary for the reform are easily feasible without the Copernican theory, especially given that historians themselves make the following perfectly justified remark: "Prussian tables had no tangible advantage over the 'Alfonsine tables'" ([926], page 61).

7.3 Why it is believed that Tycho Brahe "did not accept the theory of Copernicus". In reality, the system invented by Tycho Brahe is identical to the Copernican

We are told that Tycho Brahe revered Copernicus and was familiar with his work, but failed to accept the heliocentric model for some reason: "Tycho had a very high opinion of Copernicus, whose portrait was installed at the most conspicuous place in the observatory" ([395], page 131). And yet "Tycho did not accept the Copernican system" (ibid). The feeling of oddity grows once we become familiar with the exalted verse ode allegedly written by Tycho Brahe about the Copernican system upon reception of the present of the wooden parallax instrument manufactured by Copernicus himself. Fragments of this ode translated from [44], page 59, are as follows:

"That noble man, Copernicus, I trust
To have this devious contraption made,
Thereby pursuing a deed most daring …"

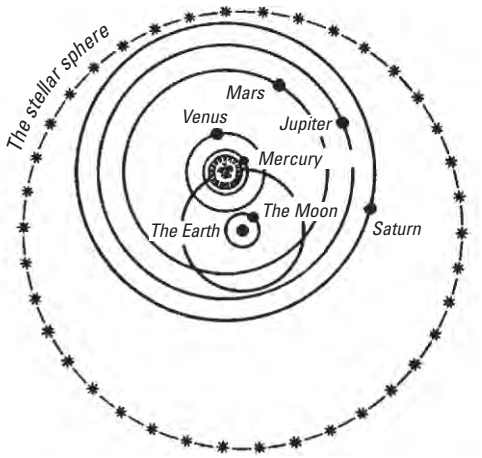

Fig. 11.32. The diagram is de facto a representation of Tycho Brahe's heliocentric system. The initial reference point coincides with the position of the Earth (in other words, the observer is located upon Earth surface). However, all the other planets rotate around the Sun. If we are to disregard the choice of the initial reference point, we instantly see that all the planets rotate around the Sun. The Copernican scheme in its initial form shall result from shifting the reference point (or the observer) to the Sun. The heliocentric system of Tycho Brahe must have been conceived earlier than the system presently ascribed to Copernicus – allegedly a predecessor of Tycho Brahe. Taken from [395], page 132.

It goes on and on, remaining quite as exalted and hopelessly romantic. Specialists in the history of astronomy also report the following, and quite correctly so: "This is the ode written by Tycho Brahe to glorify his [Copernicus's – Auth.] cosmology and the effect it had on his contemporaries" ([44], page 60). In this case, the scientific position of Tycho Brahe becomes even more bizarre. To be so deeply impressed by the Copernican cosmology and yet to reject it, no less! What could possibly be the case?

We are in favour of a simple explanation. Apparently, the final formulation of the heliocentric system only took place in the epoch of Brahe, the previous epoch being one of creation and realisation. The history of astronomy claims Tycho Brahe to have created a cosmology of his very own, one that included elements of both systems: Ptolemaic and heliocentric ([926], page 67). This creation was by no means of a speculative nature, but rather the result of an important astronomical discovery that he had made. Tycho Brahe observed comets, calculating their orbits, and made the corollary that destroyed one of the primary ideas behind the Ptolemaic system. Namely, he realised that the "hard crystal spheres" could not exist in reality – otherwise they would interfere with the motion of comets ([395], page 131). Brahe's idea was simple – and yet revolutionary. He made the discovery that the orbits of comets were greatly elongated, and must therefore intersect the orbits of other planets, crossing the respective "crystal spheres", which the XV-XVI century astronomers believed to exist. It becomes obvious that this discovery of Brahe was indeed an impetus for a massive paradigm shift. In the case of Copernicus, we are told nothing factual about his motivation for the discovery of the heliocentric system – just the legend of two fir-wood sticks, albeit very neat.

The Tychonian cosmology is shown in fig. 11.32. The same as depicted in an ancient map can be seen in figs. 0.26 and 0.27 that accompany the Foreword. The Earth remains the centre of the Universe, with the Sun revolving around it. However, all the other planets already revolve around the Sun. This is precisely why the system of Tycho Brahe is referred to as geoheliocentric today ([395], page 132). It is perfectly obvious, though, that it only differs from the "Copernican system" in terms of initial reference point selection for the coordinate system. That is the only difference. As we know from the school course of physics and mathematics, an altered reference point does not affect the actual system of mobile bodies, all that changes is the coordinate system – the location of the observer, if you will. In other words, it is the view that changes, not the actual landscape.

Let us once again consider the system of Tycho Brahe as depicted in fig. 11.32 and the ancient map (figs. 0.26 and 0.27, Foreword). In reality, from the kinematics point of view, this is a perfectly valid heliocentric cosmology, the only difference being that the centre of the reference system is the Earth. However, we know that the centre of a coordinate system can be anywhere – linked to any mobile body in the system, for one. If we transfer the initial reference point in Tycho Brahe's diagram to the Sun, we shall instantly come up with the "Copernican system" without introducing any fundamental changes. The Earth will revolve around the Sun, and all the other plan-

ets already revolve around the Sun in Tychonian cosmology. The somewhat elliptic shape of the planetary orbits is all this system lacks to transform into the finite system as devised by Kepler. Brahe's planetary orbits are all circular, as well as their Copernican counterparts. However, this effect is of a secondary nature. Let us reiterate – the heliocentric system of Tycho Brahe is de facto the Copernican system, with a differently chosen initial reference point. The difference is that the hypothetical observer is located on the Earth and not on the Sun. It is very odd that no specialist in the history of astronomy has ever mentioned this, and odder still that they claim Tycho Brahe to have "rejected the heliocentric system", since they have known the heliocentric drawing of Brahe for quite a long time.

It is obvious that the Tychonian concept preceded the Copernican idea, or coexisted with it. A better way of putting it would be to say that both concepts were identical. The "Copernican system" with the coordinate system beginning at the centre of the Sun is the evolutionary descendant of the Tychonian system, or a contemporary of the latter at the very least, but by no means a predecessor. In other words, the final "picture" of the heliocentric system must postdate Tycho Brahe and date from the epoch of Johannes Kepler, his apprentice, ascribed to the XV-XVI century scientist Copernicus in retrospect.

Therefore, the Scaligerian version that we are offered today, which claims the Tychonian system to be an odd mixture of the Ptolemaic system with the "already well known" system of Copernicus, is erroneous. This "explanation" has only come into existence due to the confusion of the specialists in the history of astronomy produced by the chronology of Scaliger and Petavius, which makes the Copernican system predate the system of Tycho Brahe. On the other hand, they knew it quite well that Tycho Brahe invented his cosmology himself and did not borrow it from anyone – the following is reported, in particular: "Tycho's own observations of planetary motion led him to the conclusion that Ptolemy's system was indeed incapable of explaining the observed phenomena" ([395], page 131).

Historians were put into a very embarrassing situation. How would one reconcile these contradictory facts with each other? They appear to have thought of a "solution", dubbing the Tychonian system "geo-heliocentric" and not heliocentric proper. The system was claimed to be non-Copernican, on the flimsy pretext that the initial reference point chosen by Tycho Brahe for his diagram was the Earth and not the Sun (allegedly in error). Once again, let us reiterate – the initial reference point of a coordinate system is of no vital importance, especially to a professional scientist. Every mathematician or astronomer is aware that the initial reference point can be put wherever it is the most convenient for the purposes of research. The actual system of mobile bodies is obviously not affected in any way. Even today the Earth is often chosen as a reference point when configurations of celestial bodies visible from the Earth are the issue. However, the general public might consider the shift of a reference point as a radical alteration of the system. This is all a question of advertising the material. This simple method was used by the specialists in the history of astronomy in order to ascribe the same cosmology to both Copernicus and Tycho Brahe, thus solving the problem. Then they started to preach about the fundamental differences between the two systems until they converted themselves and even wrote a little ode on behalf of Tycho Brahe. Such literary embellishments of his work are most likely to be "credited" to certain scientists of the XVII-XIX century; the same is true about the books of Copernicus and Kepler.

Modern astronomers are for some reason extremely puzzled about the fact that "Tycho Brahe considered his cosmology extremely important and even believed the justification of its primary postulations by careful observation to be the work of his lifetime" ([926], page 67). This is what Dieter Herrmann, the first director of the Berlin Observatory, has to tell us. And yet there is nothing to be surprised about in Tycho Brahe's stance – the scientist who discovered the heliocentric system of the universe could not be unaware of its paramount importance. Few manage to make discoveries of this calibre. So modern astronomers are thoroughly wrong to adopt a patronising attitude towards Tycho Brahe, expressing it in such ways as: "Brahe hasn't managed to develop a single theory that would concern the motion of celestial objects … The lack of a theoretical basis could possibly be explained by Brahe's limited abilities …

Fig. 11.33. The frontispiece of the ***Celestial Machine*** by Johannes Hevelius, published in 1673. "One sees Copernicus and Tycho Brahe, standing". Taken from [44], inset between pages 160 and 161.

Fig. 11.34. Ancient engraving showing Ptolemy, Copernicus and Tycho Brahe as contemporaries, or astronomers of the same epoch. Taken from [550], page 173.

Brahe realised that the task in question was too complex for him" ([926], pages 68-69).

It is all the more astonishing that some of Tycho's critics, such as Herrmann with his patronising remarks, have had the diagram of Tycho Brahe's planetary system in front of them all along ([926], page 67; see fig. 11.32) – and it is very clearly a heliocentric cosmology with the Earth being its initial reference points. What we see is the most blatant kind of disinformation imaginable. Cui bono?

The true chronological cosmology sequence must have been as follows.

1) The Ptolemaic geocentric system came first. Its complex epicycle scheme apparently dates its formation to the XV-XVI century. Earth was placed at the centre of the Universe when this cosmology was created, the initial concept being one of an immobile Earth. The motion of planets as observed from the Earth required a very complex epicycle system to explain it. The first version of the cosmology was based on the "regal" star catalogue created in the epoch of the XI century A.D. Its creation was associated with the birth of Christ in the XII century A.D. and the supernova flash in 1152 A.D., or the Star of Bethlehem. The first Christian astronomers of that faraway epoch compiled the star catalogue to honour Jesus Christ, hence the immense authority of this catalogue. It remained in circulation more or less unaltered up until the very XVI century. It would be apropos to recollect the fact that the star catalogue included by Copernicus into his

book, the so-called "Copernican catalogue", is in reality the very same old Ptolemaic catalogue, albeit rendered to another epoch by choice of a different initial reference point. This obvious fact has long been known to the specialists in history of astronomy. For example, this is what I. A. Klimishin writes about the catalogue in the book of Copernicus: "The catalogue of 1024 stars is also reproduced here. This is basically Ptolemy's catalogue – however, the longitudes are counted off γ Ari and not the vernal equinox point" ([395], page 109). This fact makes it particularly obvious that the astronomers of the Middle Ages customarily shifted the initial point of reference, transferring the "precession-based catalogue date" to the epoch they chose for whatever reason. In the XV-XVI century the astronomers took another step forward and started to develop the theory of planetary motion, which accounted for the Earth and the Sun. This was the birth of the "Ptolemaic system". Incidentally, it is said that "the structure of the Copernican oeuvre is very similar to the Almagest" ([395], page 105). Our reconstruction explains this fact perfectly well, since the final version of the Almagest was only ready in the XVI-XVII century.

2) Simultaneously with Ptolemy's planetary conception, the system of Tycho Brahe = "the ancient Hipparchus" was created in the second half of the XVI century, as we note in Chapter 10. As we already mentioned, this conception was de facto heliocentric, given that the motion of all planets but the moon occurs in circular patterns within this system, the Sun being its centre. However, it is suggested to associate the initial reference point in the heliocentric system of Brahe with the Earth.

3) Finally, the heliocentric system with the Sun chosen as the initial reference point. This system is novel to some extent, but not in any substantial way (cosmologically, that is). The only thing that is truly innovative is that the beginning of the coordinates system doesn't necessarily have to coincide with the position of the observer – the Earth, for instance. It may as well be the Sun. This made the picture much simpler for the general public as well as schoolteachers.

This system is likely to have entered astronomic practice in the XVII century – the epoch of Kepler. For some reason, it was credited to an astronomer of the XV-XVI century in retrospect – a certain Copernicus. He must have truly been a talented astronomer. It is possible that he was the author of the initial "raw" version of the heliocentric idea with the Sun, and not the Earth, as the initial reference point. However, we find it very difficult to say what it was precisely that he did. We are of the opinion that the above texts make it perfectly clear that all we know about the life and the endeavours of Copernicus comes from XVII century texts – ones written 60-100 years after his death for one reason or another.

We are of the opinion that both systems (Ptolemaic and Tychonian = Hipparchian, also known as the Copernican system) date from the same epoch of the XVI-XVII century. The systems competed and were actively discussed by the astronomers until it became clear that the most correct system is the Tychonian heliocentric model. However, later historians deprived Tycho Brahe of this discovery, which they credited to Copernicus in its entirety.

In fig. 11.33 we see an ancient engraving of 1673 from a book by Hevelius that portrays Copernicus side by side with Tycho Brahe ([44], pages 160-161). Another old engraving that depicts Copernicus, Tycho and Ptolemy can be seen in fig. 11.34. They look like colleagues and contemporaries, discussing scientific problems at their leisure. The fact that Tycho Brahe was the first discoverer of the heliocentric system, as we are beginning to realise, makes his astronomical merits all the more impressive. "According to Kepler, in his last days Tycho often whispered '*Ne frustra vixisse videar!*', or 'My life wasn't wasted in vain!'" ([395], page 128).

7.4. Is it true that the book of Copernicus, first published in the alleged year 1543, has reached us in its initial shape and form?

Let us consider the initial form of the Copernican system in greater detail. Most usually, modern publications about Copernicus reproduce the planetary system drawing from the very first edition of his book, allegedly dating from 1543 (fig. 11.35). However, there is yet another oddity about the book of Copernicus concealed here. K. L. Bayev is perfectly write to report the following: "First of all, let us remind the readers that Copernicus had preserved the epicycles of the

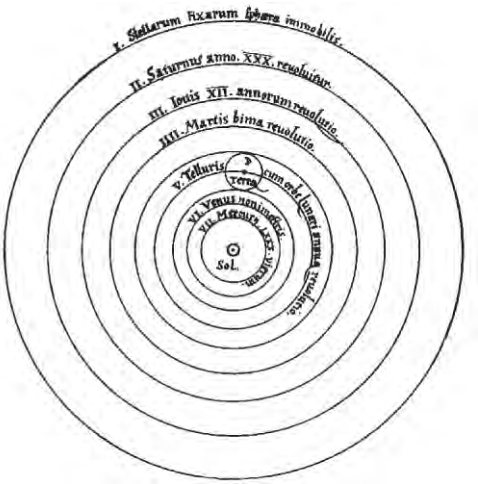

Fig. 11.35. The diagram of Copernican cosmology from the first edition of his book, ***On the Rotation of the Celestial Circles***, allegedly dated to 1543. We see no epicycles here, which might leave one with the false impression that Copernicus rejected them altogether. However, this isn't so in reality. See more on this below. Taken from [395], page 108, and [44], page 175.

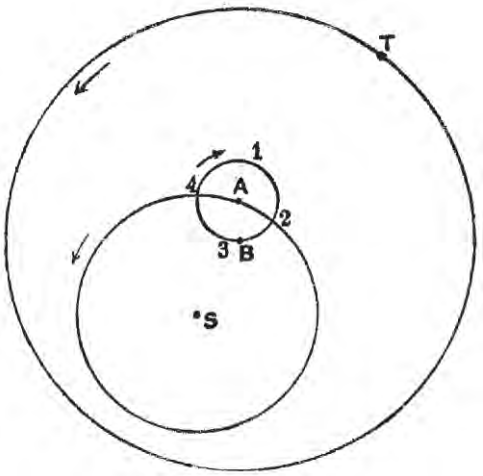

Fig. 11.36. Telluric motion around the Sun according to Copernicus. The Earth (*T*) rotates around point *B*, which, in turn, rotates around the Sun (*S*). Thus, the Sun isn't located in the centre of the Universe, and the Earth rotates around auxiliary point *B* and not the Sun, strictly speaking. This system isn't purely heliocentric as to yet. Thus, one finds different versions of the "Copernican" planetary system in different parts of the book ascribed to Copernicus and known to us today. Taken from [44], page 177.

old Ptolemaic theory and the eccentrics of Hipparchus. The illustration [see fig. 11.35 – Auth.] contains a diagram of the Solar system according to Copernicus (from the first edition of '*De Revolutionibus* …'). However, this illustration, which one is sure to find in every textbook and popular book on astronomy, does not depict any epicycles. It is a common misconception that Copernicus rejected all the epicycles of the old theories in his book. This is wrong, however – in order to demonstrate this to the reader, we provide an illustration [see fig. 11.36 – Auth.], which is a diagram of the Earth's motion around the Sun in the system of Copernicus. The Sun is point *S*; point *A* rotates around it going in a circle from the West to the East making a full cycle once every 53000 years, more or less. Point *B* is the centre of the orbit of the Earth, whose radius equals *BT* – it rotates around point *A*, in turn, but in the opposite direction, as indicated by the arrow, making a full cycle in 3434 years. Therefore, the Sun isn't in the centre of the Earth's circular orbit in Copernican cosmology, but lays 'sideways', as it were. Copernicus uses similar constructions for other planets" ([44], pages 177-178).

D. Herrmann writes the following in this respect: "This wile brings Copernicus back to the methods of the ancient astronomy, in a way, making him surpass even Ptolemy in this line" ([926], page 58).

However, in this case it turns out that the edition of the Copernican oeuvre that dates from the alleged year 1543 contains different "Copernican" cosmologies in its different parts. On the other hand, according to certain specialists in the history of astronomy, "Copernicus was forced to make his theory more complex by the introduction of epicycles" ([44], page 179). Obviously enough, this was a step forward in comparison to the Ptolemaic system, and we agree that "no matter how much the theory of Copernicus was made more complex by the introduction of additional motion that we said nothing about, it was much simpler than Ptolemy's" ([44], page 179). Copernicus wasn't yet aware that the planets had an elliptic trajectory, and, keeping some of Ptolemy's epicycles, tried to make his theory concur with the observation data.

On the other hand, a draft from the same book of Copernicus that you can see in fig. 11.35 is much more correct. The Sun is at the centre of the planetary system here. The problem is, however, that the

eccentricities of planetary orbits are rather small, and that a detailed depiction of ellipses makes them virtually indistinguishable from circles. Who would include this draft of a de facto up to date model into a book ascribed to Copernicus? Could it be Kepler in the XVII century, after the discovery of the marginally manifest elliptic nature of orbits and the initial realisation of the epicycles' extraneousness?

The draft from the Copernican book (qv in fig. 11.36) is obviously an attempt to take the next step forward after Tycho Brahe - namely, to model the elliptic nature of the Earth's orbit around the Sun with the aid of epicycles. Kepler shall soon realise that the orbit of the Earth is similar to the orbits of other planets in its elliptical nature. For the meantime, however, the aberrations of the allegedly circular planetary orbits are explained as caused by a certain epicycle system.

If we are to agree with the Scaligerian viewpoint, the attempt of Copernicus to model the elliptic nature of planetary orbits in the very first edition of his book looks odd at the very least. Indeed, the very limitedly manifest elliptic nature of orbits is an effect of a secondary nature as compared to the discovery of planetary rotation around the Sun. The implication is the Copernicus, having just discovered an amazingly simple cosmological system, immediately started to complicate it by adding a convoluted epicycle system. This is possible, but odd nonetheless. Whenever researchers delve into particularities in this manner, they are usually at a stage when the primary picture is more or less clear and had been explained to the scientific community previously. As we have witnessed, Tycho Brahe doesn't make a single attempt to account for the slight aberration of planetary orbits from the circular form. We must once again emphasize that this aberration is minute in reality. Therefore, the heliocentric system of Tycho Brahe makes the impression of an earlier origin than the system we see in the Copernican oeuvre, which doesn't merely contain the conception of the heliocentric system, but also makes the following steps concerning an issue that is more complex mathematically and more specialised – the somewhat elliptic shape of planetary orbits. This issue was only raised in the XVII century science.

Therefore, we cannot rule out the possibility that the version of the Copernican oeuvre that has reached our day and age remained in edition for a long enough time – up to Kepler.

7.5. Could Johannes Kepler be the editor or even co-author of the "canonical version" of the Copernican oeuvre known to us today?

The common opinion is that Kepler (1571-1630) "had been a staunch Copernican from the very start" ([926], page 72. Apparently, in the alleged year 1596 "he published his first work entitled 'A Cosmographical Mystery', wherein he defended the Copernican system" ([44], page 208. The book in question is Kepler's "*Prodromus Dissertationum Cosmographicarum continens Mysterium Cosmographicum*" [926], page 70.

History of astronomy reports that Kepler wrote the book that contained the first consecutive and finite version of the Copernican theory. Namely, "Kepler's book '*Epitomae Astronomicae Copernicanae*' ('The Encapsulated Copernican Astronomy'), came out in three parts – in 1618, 1620 and 1621, around 1000 pages of text altogether. It was the very first textbook on astronomy based on thoroughly novel principles. The centre of the planetary system is occupied by the Sun in the 'Astronomy', with the planets revolving around it in circular orbits" ([395], page 147).

It is spectacular that by that time "the teaching of Copernicus was already persecuted … By 1629 the '*Epitomae*' were in the list of banned books, remaining there up until 1835" ([395], page 149-150). The discoveries made by Kepler himself were published in the work entitled "New Astronomy". One must note: "this truly innovative work saw light in 1609 as a small number of copies, with neither the publisher, nor the publishing house named anywhere" ([926], page 72). Apparently, Kepler was afraid of persecution (or, alternatively, the editors were afraid of the repressions that the publication of his book could bring in its wake.

The final version of the Copernican cosmological system *as formulated in Kepler's works* came out in the atmosphere of a severe conflict with the church. We learn the following important fact: "In 1616 the teaching of Copernicus was declared heretical … the book … of Copernicus was 'to remain under arrest until rectification'" ([44], page 193). This is how this de-

cree of 5 March 1616 sounded. We cite fragments: "Since it became known to the above congregation that the false teaching of the Pythagoreans, which contradicts the Holy Writ in every way, as preached by Nicolaus Copernicus in his book 'On the Revolutions of the Celestial Spheres' and Didacus Astunicus in 'Comments to Job', has spread and become accepted by many … The congregation deems it proper to withdraw said books from circulation … until the day the necessary amendments are introduced" (quoting in accordance with [395], pages 158-159).

Four years later, in the middle of May 1620, the congregation came back to this issue. The following was declared: "The Holy Congregation of the Index states that the work of the famous astrologer Nicolaus Copernicus 'On the Revolutions of the Celestial Spheres' is to be condemned utterly … It is henceforth only permitted to publish the book of Copernicus upon introduction of the following corrections" (quoting in accordance with [395], page 159).

This information is vital. We see that in the early XVII century the Copernican cosmology was banned, and his book arrested for correction. One mustn't doubt it that the orders were followed and that someone did edit or rewrite the book of Copernicus, subsequently publishing the altered version as a "slightly corrected" one. This took place in the epoch of Kepler. Therefore, one has very serious reasons to doubt the fact that the authentic first edition of the Copernican book dating from the alleged year 1543 has survived until our days. Most likely, the previous version (if one did exist before Kepler, that is) was heavily edited in the XVII century and published with the "old date", after the destruction of the original.

And thus, if anyone attempts to convince the scientific community that the existing version of the book of Copernicus is identical to the original published in the alleged year 1543, this will have to be proved specifically. Due to the perfectly clear orders of 1616 and 1620 that the book be "amended", no such attempt is likely to ever succeed.

According to our reconstruction, the fragmentation of the Great = "Mongolian" Empire began in the early XVII century. A wholly new epoch of the Reformation mutiny began. Old imperial institutions were replaced by new ones all across the Western Europe. History in general was being altered, as well as the history of sciences. As we are beginning to realise, the book of Copernicus did not escape the questioners' attention.

Scaligerite historians occasionally report that Luther and Melanchton spoke out against the Copernican system in the XVI century. However, a closer study of the issue reveals that the data are very ambiguous. This is what I. A. Klimishin has to tell us on the subject, for instance: "The presumed hostile attitude of the Protestants towards Copernicus, and Luther himself in particular in 'Table Talk' … It would be expedient to recollect the fact that Luther himself didn't write 'Table Talk' – a recording of table conversations recorded in a clandestine way from memory by one of his more industrious apprentices. They remained unknown for several centuries and were only published in our century. In reality, the Protestants were quite loyal towards the Copernican teaching" ([395], page 102). Incidentally, Melanchton called Copernicus a "Sarmatian astronomer" ([926], page 61).

A very important circumstance is therefore revealed. The information about Luther being critical of Copernicus was first published in the XX century – likewise Luther's "Table Talk".

It could be that the Protestants did not criticise Copernicus in the XVI century due to the non-existence of his book in that epoch. The entire issue of Luther's and Melanchton's attitude towards the Copernican model must have been raised in the XVII century the earliest, which is about the same time others started to refer to "the classics" as well. Some (Kepler, for instance) said that the heliocentric system was invented by Copernicus in the XVI century (thus being a classic of astronomy, that is). His opponents claimed that other classics, namely, Luther (or Melanchton) spoke out in indignation against the heliocentric teaching even then. The necessary "body of evidence" such as the letters of the classics or the recordings of their intimate table talk would never be in short supply, and has always fallen into right hands. Therefore, the XVII century struggle led to a confrontation between "XVI century classics", who had been quite unaware of it and actually friendly in real life.

It is possible that in the epoch of military, political and religious unrest of the XVII century Kepler thought it dangerous to sign the final version of the

heliocentric planetary system concept by his own name, with the beginning of the coordinate system coinciding with the Sun, the centre of the world. The opinion about this version contradicting the Bible must have already existed by that time. Let us recollect the incineration of Giordano Bruno in 1600 by the orders of the Inquisition ([926], page 76). Accusations against Galileo and Kepler were voiced as well. "In 1616, a congregation of 11 Dominicans and Jesuits started a process against the teaching of Copernicus in Rome … By the verdict of the experts of the Holy Tribunal, the Copernican teaching as followed by Galileo was declared insane and absurd … not to mention absolutely heretical … It took a two-day session to ban the work of Copernicus" ([926], page 79).

Specialists in the history of science report the following: "Given this tense political atmosphere, the decree of 5 March [1616 – Auth.] … made a grave impression among the scientific community … The third Amsterdam collection of Copernican works came out in 1617; the fourth one was published in Warsaw as late as in 1854, after the acquiescence of Pope Pius VII for the publication of books where the motion of the Earth and the immobility of the Sun are interpreted from the viewpoint of modern astronomy was received. The works of Copernicus, Kepler, Galileo and Foscarini were removed from the index of banned books in 1835" ([946], page 134).

Therefore it turns out that after 1617 the book of Copernicus remained banned from publication for 237 – over two centuries! As we can see, the first Polish edition of Copernicus only dates from the middle of the XIX century. Why would the work of the greatest Polish astronomer of the XVI century be first published in his homeland 400 years after his death?

Let us recollect that the first edition of the Copernican oeuvre came out in Nuremberg in the alleged year 1543. The second edition was published in Basel, in the alleged year 1566, the third – in Amsterdam, in the alleged year 1617, and, finally, the fourth edition came out in Warsaw in 1854 ([946], page 134).

D. Herrmann, an astronomer and a specialist in the history of astronomy, writes the following: "Persecutions that had already claimed Giordano Bruno as their victim and were becoming ever harder for Galileo made Kepler very circumspect indeed. In 1617, right after the inquisition's first process over Galileo, there was an attempt to summon Kepler to Bologna, which was met with a decisive refusal – Kepler claimed he would not suffer insults from informers" ([926], page 81-82).

Despite all of Kepler's precautions, "in 1618 … Kepler's 'Encapsulation of Copernican Astronomy' was banned" ([946], page 135). It wasn't just Copernicus that they banned, in other words, but also Kepler's works about Copernicus. As a result, some of Kepler's works were also withdrawn from scientific circulation for some time. It didn't end there. In the early XVII century the heliocentric theory became so grave a matter that Kepler was forced to take drastic measures, going so far as feigning a change of confession. The following vivid fact is reported, for example: "Matters went so far that in his 'World Harmony', an oeuvre dating from 1619, Kepler the Protestant presents himself as a staunch Catholic" ([946], page 135). One must say, truly great scientists are very seldom forced to resort to "mimicry" of this kind.

All of the above leads us to the very obvious conception that Kepler and his colleagues apparently had to "deprive" themselves and the great Tycho Brahe of the heliocentric conception and ascribe it to a famous astronomer who had lived a century earlier. Especially assuming that Copernicus indeed formulated a raw version of this conception in the XV-XVI century. The romantic legend about Copernicus seeing his book published on his dying day must be a reflection of the very same circumstance, namely, that the book was published long after the death of Copernicus. The XVII century may have placed the book in the hands of the dying Copernicus purely symbolically, paying their dues to his authorship of the heliocentric idea in its initial form.

We must reiterate that most works attributed to Copernicus, Tycho Brahe and Kepler today must have been created later, in the XVII-XIX century, and ascribed to them in retrospect so as to justify the history of astronomy in its Scaligerian version.

Let us conclude with asking the following question, which has the character of a general remark, and yet might prove useful for the analysis of the convoluted and distorted history of astronomy in the XVI-XVII century. It is a random occurrence that the name "Copernicus" sounds somewhat similarly to "Kepler + Nike", or "Kepler the Victor"? Without vo-

calisation, we end up with CPR + NC and KPLR + NK. We have already seen that Kepler took part in the propagation of the Copernican teaching in the XVII century. Could this be yet another chronological shift, one of circa 100 years? Kepler is presumed to have lived in 1571-1630, and Copernicus – in 1473-1543. According to Scaligerian chronology, these two astronomers are roughly one century apart. A 100-year shift was already discovered in the research of mediaeval dynasties – the history of Russia, for example, qv in CHRON1 and CHRON4. Scaligerian history considers both scientists great astronomers and discoverers of fundamental laws.

We have already found out, for instance, that the famous XVII century chronologist Dionysius Petavius ("the Lesser", or "the Small") drew "a picture of himself" in the distant past as "the famous VI century chronologist Dionysius the Little" (see CHRON1 and CHRON2). The chronological shift equals about 1000 years here.

Another possible interpretation of Copernicus's name is "Cyprenicus", or "Scientist from Cyprus", someone who worked or lived there or was related to Cyprus in some way. Let us recollect that Cyprus is a large island in the East of the Mediterranean, off the coast of Asia Minor. It was a famous location in the Middle Ages (for its copper mines in particular). This is where its name is likely to come from – the Latin for "copper" is "*cuprum*" and also "*cyprus*" ([237], page 284). Thus, a Cypriote could become "*Kopernik*" in the Slavic languages and then "Copernicus" in Latin. Incidentally, we have already mentioned the fact that Copernicus was known as a "Sarmatian" (or Slavic) astronomer ([926], page 61). We must also note that the geography and climate of Cyprus are a great deal more appropriate for astronomical observations than the foggy Frauenburg. Apart from that, Cyprus is geographically close to the "ancient" observatories, since it is right in between the Isle of Rhodes and the Egyptian Alexandria.

7.6. The heliocentric cosmology and the Biblical "stopped sun"

Let us note that the idea of making the Sun the centre of the Universe – which can be referred to as "stopping the sun", or making it immobile, after a certain manner, dates from the very same epoch of the XVI-XVII century, which is when the final edition of the Biblical books was taking place. One gets the following idea. Could the famous reference to the stopped sun in the book of Joshua (10:12-14) be a poetic reflection of the deep impression made on the people of the late XVI – early XVII century by the heliocentric cosmology? They finally realised that the Sun can be stopped – contrary to the obvious, since it always moves across the sky and never stops. It could be for an ulterior reason that the stopping of the Sun was ascribed to none other but Joshua, Son of Nun (see CHRON6). In our reconstruction, he is the conqueror of the XV-XVI century, the epoch of the Ottoman conquest of the "Promised Land". The idea of a heliocentric system came into being in the XVI century. As we have seen, it was formulated fully in the work of Tycho Brahe. An ancient drawing of his system can be seen in fig. 11.37.

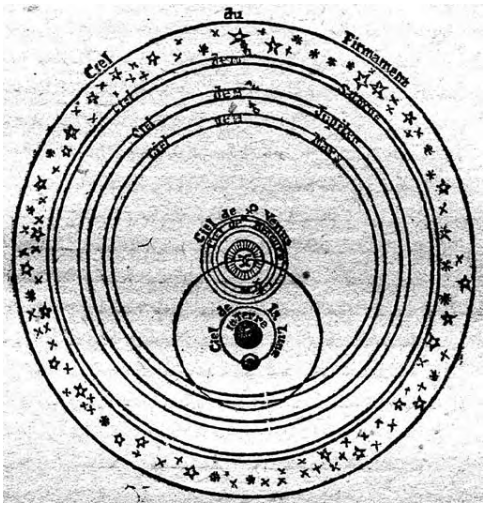

Fig. 11.37. Ancient cosmological scheme according to Tycho Brahe, which is the heliocentric system with the initial reference point affixed to the Earth. Taken from [946], page 151.

It is remarkable that the vestiges of the discussion concerning the Biblical stopped Sun as held by the astronomers and the ecclesiastical authorities of the XVI-XVI century should reach our time in relation to the Copernican system. The following, allegedly negative, remark made by Luther about Copernicus, is usually recollected in this respect: "The fool wants

to turn the whole art of astronomy upside down – but isn't it stated in the Holy Writ that the Lord asked the Sun to stop, and not the Earth?" (quoting in accordance with [926], page 61). However, we must take a second look at this phrase (ascribed to Luther today). If we are to remove the word "fool" from the above phrase, there will be absolutely nothing negative about it. Moreover, it clearly states that the Sun was stopped, and not the Earth – a de facto confirmation of what Tycho Brahe and Copernicus claimed necessary: to stop the Sun and not the Earth. In other words, one has to place the Sun at the immobile centre of the world. Since we already know that some of the texts ascribed to Luther today date from the XIX century, it may very well be that the Scaligerian editors of the XIX century have introduced a single word ("fool") in order to replace the positive opinion held by Luther of the heliocentric system by a negative one. Of course, nowadays we are told that Luther regarded the Biblical passage in question as a confirmation of the Earth's immobility – and yet we see that the interpretation that confirms the Copernicus concept is also perfectly legitimate.

Let us sum up. There is a possibility that the Biblical book of Joshua reflects the heliocentric cosmology discovered by Tycho Brahe at the end of the XVI century A.D.

8. ANNA COMNENA CONSIDERS PTOLEMY HER CONTEMPORARY. In other words, Ptolemy couldn't have lived earlier than the XII century A.D.

Given our dating of Ptolemy's star catalogue, one might well enquire about how the ancient authors dated the Ptolemaic epoch. Let us turn to "Alexiad", a famous work of Anna Comnena ([418]), allegedly an author of the XII century and the daughter of Alexis Comnene, Emperor of Byzantium. Of course, only a very late edition of this book has reached our day – one of the XVII-XVIII century. Nevertheless, this book appears to have preserved important data about the history of astronomy, which concur well with our reconstruction. They were pointed out to us by V. A. Ivanov. Let us also emphasise that Anna Comnena is considered one of the most informed and best educated mediaeval authors, which makes the evidence she provides all the more valuable.

Thus, Anna Comnena writes the following about astronomy and astrological predictions: "Let me … mention predictions in brief. It is but a new invention – no such science existed in antiquity. Predictions weren't known in the time of the most learned astronomer Eudoxus; Plato knew nothing about them, either, and even the astrologer Manethon knew nothing of this science. When they foretold something, they didn't know how to make a horoscope, establish the centres, observe the disposition of constellations and the rest of the knowledge that the inventor of this method passed on to the generations to follow" ([418], page 186).

These words of Anna Comnena leave no shadow of a doubt about the fact that such concepts as the horoscope (or the distribution of planets among the constellations), constellations themselves as well as centres (apparently, the poles of the celestial sphere) only appeared in her epoch – the XII century A.D., according to Scaligerian chronology. In particular, Anna Comnena claims that the ancient astronomers (Eudoxus and Manethon) knew nothing of constellations, although the Scaligerian history of astronomy tries to convince us that the division of the celestial sphere into constellations was widely used in the "ancient" Greece, qv above.

In CHRON7, Chapter 16, we shall consider the meaning of the mediaeval constellation symbolism and demonstrate that it was conceived in the XI-XVI century – even its earliest elements cannot predate the epoch of Christ, or the XII century A.D. This explains the claim of Anna Comnena perfectly well.

Furthermore, one wonders why Anna Comnena neither mentions Ptolemy, nor Hipparchus, while referring to the astronomers she considers ancient. These names are absent from the index of the "Alexiad" in its modern academic edition ([418]). Yet she does mention Eudoxus and Manethon. And yet we are told that in the epoch of Anna Comnena Ptolemy's Almagest had remained the primary astronomical work for a whole millennium (created in the alleged II century A.D.) Therefore, Anna Comnena should have mentioned it first and foremost when referring to astronomy.

Yet if we read on, we shall be surprised to discover

that Anna Comnena does actually mention Ptolemy, but as a contemporary of hers, no less. This is what she writes about the time of her father – Alexis Comnene: "That was the time … when the famous Egyptian from Alexandrian generously shared the secrets of astrology with everyone. Answering numerous questions, this Alexandrian was very precise in his predictions of the future, and did not even use the astrolabe in some cases … The Alexandrian's successful prophecies were based on the art of logical thinking. The autocrat saw the young people, who believed the Alexandrian to be a prophet of some sort, congregate around him. Twice he addressed him with questions, and both times the Alexandrian provided him with satisfactory replies. Alexis … designated Rhaedesto as the Alexandrian's residence, showed great care and generously provided everything necessary at the expense of the treasury" ([418], page 186).

In general, a whole page of Anna Comnena's book is concerned with the famed Alexandrian – however, mysteriously enough, his name isn't mentioned anywhere once. On the other hand, the names of all the other astronomers and astrologers are faithfully reproduced in Anna Comnena's book ([418], pages 186-187), although she says a great deal less about them.

However, history knows of just one famous Alexandrian astronomer, namely, Ptolemy of Alexandria, who is most likely to be the character referred to by Anna Comnena. The rather odd absence of his name from the pages of her book is highly conspicuous – apparently, the XVII century editors simply erased the famous name of Ptolemy from the pages of the "Alexiad". After all, in the XVII century, when this work was brought into correspondence with Scaligerian chronology, Ptolemy was sent to the II century A.D., and the lifetime of Anna Comnena was dated to the XII century A.D., which resulted in an arbitrary millenarian gap between the two. Historians were forced to make corrections in the text of the Alexiad so as to prevent unnecessary questions. Nevertheless, it is perfectly easy to identify the nameless Alexandrian as Ptolemy.

The compilation of a star catalogue was too great a task for a single scientist, no matter how talented – it required state support, instruments, helpers, and, finally, money – a lot of it. Indeed, Anna Comnena reports that the all of the above was provided by the Emperor himself.

The mysterious observation spot Rhedesto, mentioned but once in the entire work of Anna Comnena, qv in the index ([418], page 682) is most likely to identify as the famed Isle of Rhodes, apparently considered a convenient astronomical observation location. According to our hypothesis, in the XVI century the "ancient" Hipparchus = Tycho Brahe performed his observations there as well. At any rate, the Isle of Rhodes is frequently mentioned as a place of astronomical observations – in Ptolemy's Almagest, for one.

9. OBVIOUS DATING OF THE PTOLEMAIC EPOCH ON PTOLEMY'S PORTRAIT IN THE OLD GERMAN "GLOBAL CHRONICLES" BY HARTMANN SCHEDEL

Let us turn to a well-known mediaeval book of Hartmann Schedel, which is dated to the XV century ([1396:1]). It is known as "The Book of Chronicles with Figures and Illustration, from Genesis to Our Days" ([90], page 23). It is also known as "The Nuremberg Chronicle" or "The Augsburg Chronicle". It is believed to have been "the first illustrated encyclopaedia of world history and geography ever" ([90], page 23).

"His 'Global Chronicle' was compiled from Biblical stories, the reports of the ancient historians (Herodotus and Titus Livy for the most part) as well as mediaeval authors, reports of Schedel's contemporaries and his own judgements … The book came out in German and in Latin simultaneously, and was immensely popular … It was sold all across Germany, as well as Vienna, Paris, Graz, Krakow, Lyon and Budapest; it was ordered by customers in Milan, Passau, Lübeck, Ingolstadt, Danzig, Frankfurt and Bamberg. It was sold by the most famous vendors of Venice, Florence and Geneva … The engravings of the 'Augsburg Chronicle' were apparently made by Thomas Burgkmeier (1444? – 1523), an engraver from Augsburg and the father of the famous painter Hans Burgkmeier … The illustrations depict the events of the ancient history and recent times … rulers and philosophers, poets and scientists" ([90], pages 23-24).

Ptolemy's portrait has been included into Schedel's chronicle as well (fig. 11.38). It turns out that this

Fig. 11.38. Ancient drawing of Ptolemy from the ***Global Chronicle*** by Hartmann Schedel. Augsburg, 1497. Taken from [90], page 25.

Fig. 11.39. Ancient drawing of Ptolemy from the ***Global Chronicle***. A fragment. The chronicle dates from 1497. We see a close-in of the sector where Ptolemy is holding the celestial coordinate grid. The dating we see here reads as 1546 – or, possibly, 1346. In other words, Ptolemy's lifetime is dated to the XIV or even the XVI century A.D. Taken from [90], page 25.

portrait contains a date. Ptolemy is holding a sector with a coordinate grid in his hands (fig. 11.39). Apart from that, we can see a date here: 1346 or 1546, the ambiguity arising from the fact that there is a line right next to the top part of the figure of five, which may be part of a poorly printed letter. If this is the case, the figure of five transforms into a figure of three. The rest of the figures can be read perfectly well – they completely conform to the standards of the epoch, in particular, the figure of four, which looks like the inverted letter gamma. Numerous examples of figures in mediaeval translation can be found in Chron1, Chapter 6:13.

Thus, Ptolemy's lifetime is dated to the XIV or the XVI century here, which is in excellent correspondence with our dating of the Almagest.

We must note that this date very obviously does not refer to the date of the engraving's manufacture. Firstly, it is right on the figure of Ptolemy and not anywhere near it; also, the figures are rather large. Secondly, this date, whatever the interpretation, 1346 or 1546, can by no means refer to the lifetime of the artist, who is presumed to have lived in 1444-1523 ([90], page 24). The year of the artist's birth is accompanied by a question mark, but it changes nothing in this case, since there is nearly a whole century between 1346 and 1444.

It must also be noted that the above date cannot be regarded as numbers grading the instrument in Ptolemy's hands, either, since in this case they would be drawn evenly or separated by equal gaps, which is not the case. The figures transcribe as a mediaeval date, and without any ambiguity whatsoever.

10. THE MEANING OF THE WORD "PELUSIENSIS" (OR "PHELUDIENSIS") IN THE FULL NAME OF PTOLEMY

The title pages of the Almagest's first editions call Ptolemy a philosopher and mathematician from Pelusian (or "Pheludian" in other editions) Alexandria.

For instance, we read the following in the title page of the Latin edition allegedly dating from 1537: "*Cl. Ptolomaei Phelvdiensis Alexandrini Philosophi et Mathematici …*" (see fig. 11.4 above).

The title page of another Latin edition (ascribed to 1551 today) says the following: "*Clavdii Ptolemaei Pelusiensis Alexandrini …*" (see fig. 3.18).

We must pay close attention to the word "Pheludiensis" (or "Pelusiensis") in this title. Different transcriptions of this word must result from confusion in letters – for example, the letter "S" as it is written in the word "Pelusiensis" (fig. 3.18) can be taken for the letter "d" with a missing element. Indeed, in the second version we see the letter "D", namely, "PhelvDiensis", qv in fig. 11.4.

Apparently, both versions were derived from some word that wasn't too comprehensible to the editors of the above Latin editions (or earlier copyists, whose manuscripts were used in preparation of these editions). What exactly it is that the word in question stands for appears to baffle the modern commentators. Let us quote the commentary from the Russian edition of the Almagest ([704]), for instance: "It is reported that Ptolemy was born in the Hermian [Ger-

Fig. 11.40. The cosmological model of Cosmas Indicopleustes, allegedly dating from the VI century A.D. There is a drawn copy of this old map in CHRON3, Chapter 11, fig. 11.7. The Earth is flat; Mount Ararat rises from its centre, while the Sun and the Moon rotate around the latter. One sees that the author's understanding of astronomy is very rudimentary, reflecting the very low level of scientific development in the epoch of the X-XIII century. Taken from [1177], page 262.

man? – Auth.] Ptolemaeia … according to another version, he was born in Pelusius … which is, however, more likely to be a corruption of the name 'Claudius' as encountered in Arabic sources" ([704], page 431). Therefore, the word "Pelusiensis" (or "Pelusian") is considered to be a corrupted version of some other word by the modern commentators. The exact identity of this word remains a mystery to them.

Let us voice the following assumption in this respect. One must note that a comparison of the above two variants of the mysterious word lead one to the following simple idea. It could be that they are derived from the Slavonic word "*poludennaya*", or southern Alexandria, in other words. This Russian word was then transcribed with Romanic characters as "Peludensis", and later "Pelusiensis", with the first D transforming into S in one of the versions. In the second version, the letter D remained intact, but the P became "PH" (F), which complicated the recognition of the word. A while later, attempts to find out the initial meaning were rendered to pure guesswork.

And yet the word "*poludenniy*" is well known to

Fig. 11.41. An "ancient" inlay from a synagogue, allegedly dated to the VI century A.D. This inlay (Beth-Alpha, Hefzibah) is presumed to be done in the Byzantine tradition, with Hebraic inscription ([1177]), page 266. We see the Zodiac and the four seasons in the corners. According to historians, what we see in the middle is a solar deity wearing a crown (distinctly Graeco-Roman), with a crescent on his right and with 23 stars around him, and his chariot drawn by four horses. As we can see, one could find zodiacs in the most curious places apart from the "ancient" Egyptian temples – synagogues, for instance. Taken from [1177], Ill. 15.4, page 267.

us from the ancient Russian language, where it stood for "southern". Therefore, "Pelusiensis Alexandria" translates as "Southern Alexandria".

Therefore, it is most likely that the lost manuscripts of the Almagest claimed Ptolemy to be a philosopher and mathematician from Southern Alexandria. This is perfectly natural – Ptolemy was an astronomer who performed many observations, and it is much easier to observe the sky in southern latitudes – more stars are visible there, since there are no fogs and the skies are clear more often.

There were many cities known as "Alexandria" in the Middle Ages, one of them in Russia – the famous Aleksandrovskaya Sloboda near Moscow, a royal residence of the XVI century known as the city of Aleksandrov nowadays (see CHRON6, Chapter 7 for more details). Another city called Alexandria existed in North Italy, as indicated on many mediaeval maps – and so on, and so forth. Therefore, the title page of the Almagest's printed version specified that Ptolemy lived and worked in Southern Alexandria and not any other city named similarly. It might identify as the modern Egyptian city of Alexandria. Alternatively, the XVI century Southern Alexandria of the "Mongolian" Empire could be located much further to the South – in the South of the modern India, for example, where the imperial observatories could be located in the XV-XVI century, with corresponding astronomical observations carried out.

Let us conclude with some auxiliary data of interest – see figs. 11.40-11.42.

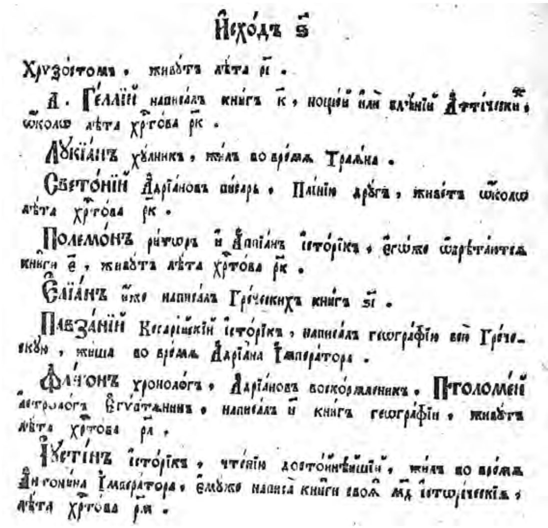

Fig. 11.42. Information about Ptolemy from the Western European ***Luteran Chronograph*** dating from 1680 (private collection): "Phlegon the chronologist, a creature of Hadrian. Ptolemy the Egyptian, an astrologer. Wrote 8 books on geography; both lived in the 130th year of Christ". This is all that the chronograph in question knows about Ptolemy. One has to note that the actual Almagest isn't mentioned here at all, despite the references to Ptolemy and his ***Geography***. This is odd, if one is to believe the information about several Western European publications of the Almagest that date to the XV-XVI century. Why do we find no mention of the Almagest in a chronograph of the late XVII century? Could it be that the first publications of the Almagest came out near the end of the XVII century, to be eventually dated "backwards" – to the alleged XV-XVI century? Taken from [940], sheet 145, reverse. A photocopy of the original.