



Fig. 0.13. An ancient drawing of Copernicus next to a map of the Old World. We see a headdress semblant to a turban on Ptolemy's head. A drawing from the 1507 world map by Martin Waldseemüller (Martin Waldseemüller's Weltkarte von 1507, Abb. S. 114/115). Taken from [1009], page 12.



Fig. 0.14. A close-in of a fragment of the previous drawing. Taken from [1009], page 12.



Fig. 0.15. An ancient drawing of Claudius Ptolemy (standing on the left), and three famous mediaeval cartographers: Gerardus Mercator (sitting in the centre), Jodocus Hondius and Willem Blaeu (sitting on the right). Title page from the *Concise Atlas* by Johannes Jansson. Amsterdam, 1666. An engraving by J. Weisheer made after the drawing of S. Webbers. Chisel. Once again, historians suggest these characters (Ptolemy and the three cartographers of the XVI-XVII century) to be separated from each other by some 1300-1400 years. We see two muses next to Ptolemy. Taken from [90], page 6.



Fig. 0.16. A close-in of a fragment of the above picture. We see a pair of mediaeval spectacles on the face of the “ancient” Ptolemy. It is most likely that in the XVII century people still remembered Ptolemy as a scientist from the epoch of the XIV-XVI century. Taken from [90], page 6.



Fig. 0.16a. Monk with spectacles ([497:1], page 35).



Fig. 0.17. An ancient drawing of Ptolemy observing the stars. Etching on wood, 1517. We see Ptolemy wear a royal crown – a mediaeval one, which is rather remarkable. We see such trefoil crowns in many mediaeval coats of arms. Taken from: Gregor Reisch, *Margarita philosophica ...* Basel: Michael Furter, 1517. Taken from [1009], page 21.



Fig. 0.18. A close-in of the fragment with the mediaeval royal crown on the head of the “ancient” Ptolemy. Taken from [1009], page 21.

“the Allegory of Cartography and the prominent cartographers: Claudius Ptolemy, Gerhard Mercator, Judocus Hondius and Willem Blau” ([90], page 6). Ptolemy is on the left surrounded by two “muses”. However, the fact that the XVII century artist had no doubts about portraying the “ancient” Ptolemy and three other cartographers of the XVI-XVII century side by side may very well mean that he was perfectly correct in his doing so. By the way, we see the “ancient” Ptolemy wearing spectacles, a typically mediaeval object (fig. 0.16). This drawing also emphasises a rather personal detail – Ptolemy appears to be adjusting the spectacles that have slid to the tip of his nose. Ptolemy may have worn glasses in reality, and this rather characteristic trait of his may have been remembered by the mediaeval artist and reproduced on the drawing. We feel obliged to remind the reader

that spectacles appeared in the XIII century the earliest ([497:1], pages 34-35). “Around the middle of the XIV century spectacles were already a very common object – a fresco of 1352 depicts a bespectacled monk” ([497:1], page 35). We reproduce this drawing in fig. 16a.

In fig. 0.17 we see an old portrait of Ptolemy that dates from 1517 ([1009], page 21). Ptolemy is wearing a trefoil royal crown on his head (fig. 0.18). These crowns are virtually identical to the kingly crowns worn by the Evangelical Wise Men as portrayed on the mediaeval sarcophagus of the Three Wise Men, for instance (it is located in the famous Cologne Cathedral in Germany – see CHRON6, Chapter 3). We can also see three crowns of the same trefoil design adorning the mediaeval coat of arms of Cologne (figs. 0.19 and 0.20). Mediaeval crowns of this shape are en-

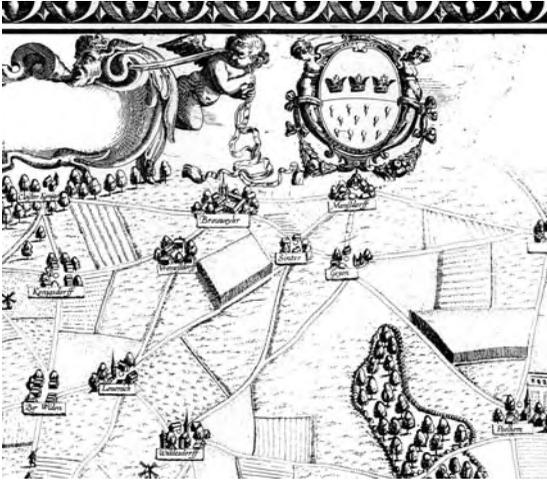


Fig. 0.19. A fragment of a mediaeval map depicting the German city of Cologne, dating from 1609. The engraving was made by Abraham Hogenberg. We see three royal crowns of the same shape as the one worn by the “ancient” Ptolemy. Taken from [1228].

Fig. 0.20. A close-in of the fragment with the coat of arms of Cologne with the crowns. Taken from [1228].



Fig. 0.21. An ancient French miniature of the Rhemish Missal dating to 1285-1297 (Missel à l’Usage de Saint-Nicaise de Reims). The royal crowns we see here are of the same shape as the one worn by Ptolemy. Taken from [537], page 207.



Fig. 0.22. A close-in of the fragment with the royal crowns. Taken from [537], page 207.

countered in a great deal of mediaeval artwork portraying royalties and dating from the XIV-XVI century (in Sweden, for instance).

We see trefoil royal crowns that are perfectly similar to the above in mediaeval French miniatures (such as one may find in the famed Rhemish Missal created between 1285 and 1297, for example). See [537], pages 194 and 207; also figs. 0.21 and 0.22.

Therefore, we see the “ancient” Ptolemy wearing a famous mediaeval crown on his head. See more on the history of the trefoil crown of the Great = “Mongolian” Empire in CHRON7, Chapter 15:2.

## 8. TYCHO BRAHE

Tycho Brahe (1546-1601) was one of the most renowned astronomers of the Middle Ages, a professional scientist who played a major part in the development of fundamental astronomical conceptions. On 21 August 1560, in his second year at the University of Copenhagen, there was a solar eclipse observed as partial in Copenhagen. Tycho Brahe was astonished by the fact that this event had been predicted earlier ([395], page 123). This event impelled Tycho Brahe to develop a deep interest in astronomy.

An old portrait of Tycho Brahe can be seen in fig. 0.23. In fig. 0.24 we see an old engraving that portrays Tycho Brahe, his colleagues and his famous quadrant. In fig. 0.25 we reproduce another version of the very same engraving in order to draw the reader’s attention to the rather liberal manner in which the “copyists” treated old artwork. The two versions strike one as identical at first sight; a more in-depth study reveals substantial discrepancies. They lead to no confusion in this particular case, but the very fact that mediaeval copyists did not deem it necessary to reproduce originals faithfully leads one to certain conclusions.

In 1569 Tycho Brahe was in Augsburg, the residence of the craftsmen who manufactured instruments of sufficiently high precision for the observation of celestial bodies. This is where Tycho’s quadrant and sextant were made, followed by another quadrant with a radius of circa 6 metres. The full height of this instrument equalled 11 metres, and it could count angles with the precision of 10". On 11



Fig. 0.23. An ancient portrait of Tycho Brahe. Taken from [1160], page 310.

November 1572 Tycho Brahe noticed a bright star in the constellation of Cassiopeia, which hadn’t been there before. He instantly started the angular distances between this new star and the main stars of Cassiopeia as well as the North Star. Somewhat later, Kepler wrote: “Even if this star wasn’t really an omen of any sort, it has heralded and made a great astronomer at the very least”. The Tychonian supernova was brighter than Venus, and could be seen for 17 months with the naked eye, even in the daytime.

We are told that in 1576 King Frederick II of Denmark and Norway bestowed the Isle of Hven near Copenhagen upon Tycho Brahe. He also invested a large sum of money into the construction of the Uraniborg observatory there – the name translates as “The Castle of Urania”. We shall discuss the possible true location of this observatory below, in Chapter 10. It was most likely at a considerable distance from Copenhagen. The observatory was equipped with precise angular instruments. Several years later, the observatory of Stjerneborg (“Star Castle”) was built. All the measurement instruments were installed underground so as to protect them from environmen-

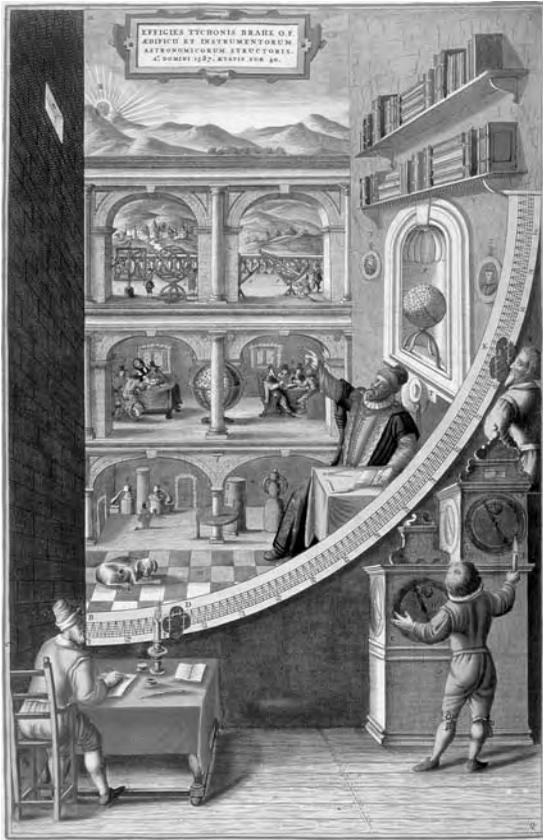


Fig. 0.24. An ancient drawing of Tycho Brahe and his famous quadrant. Taken from [1160], page 311.

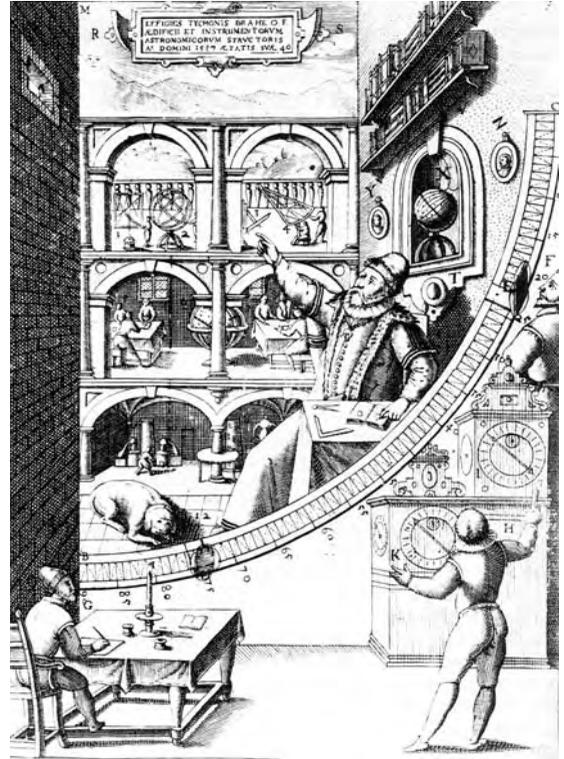


Fig. 0.25. Another version (?) of the old engraving presented in the previous figure. Tycho Brahe and his quadrant. Mark the fact that these two drawings differ from each other somewhat; nevertheless, each of them is declared to be original nowadays! Taken from [1029], page 24.

tal disturbances of any kind. The Isle of Hven became a unique astronomical centre of global importance, and remained one for over 20 years. This is where Tycho, accompanied by his apprentices, conducted observations of exceptional and unprecedented precision. Unique astronomical instruments were manufactured there as well ([395], page 126).

Diagrams and descriptions of Tycho Brahe's primary instruments were published in his book entitled "The Mechanics of Updated Astronomy" (published in 1598). First and foremost, Tycho used quadrants with radiuses of 42, 64 and 167 cm. The most famous of all was the 194-centimetre quadrant, whose arc of cast brass was rigidly affixed to the eastern wall of the observatory (precisely oriented at the North and the South). Special techniques of raising the pre-

cision of observations allowed for calculation precision margin of 10" or less (5" in case of the "wall quadrant"). The latter required 3 people for operation – one to watch the celestial sphere and record the height of the celestial object under study, another to write the data down in a journal, and yet another person to record the time of meridian crossing with the aid of several chronometers, no less, installed right there in the observatory (see figs. 0.24 and 0.25). In 1581 Tycho Brahe used a chronometer with an extra hand for seconds, estimating their precision margin as four seconds.

Another group of instruments comprised the sextants. Tycho Brahe oversaw and directed the manufacture of several armillary spheres. "One must mention a large globe of 149 centimetres in diameter,