ENG


# KOPERNIK

## semper vivus

## Copernicus sempre vivus ... (by way of introduction)

*Geniuses begin in the wombs of mothers from the intersection of two foreign bloodstreams* - as Jeremi Wasiutyński wrote in a colourful biography of the astronomer. When, on 19 February 1473, at 4:48, the future genius came into the world, no one was expecting the influence that he would have on the world he saw. And no one was able to predict what calibre of inspiration he would bring to the world of science – and to all sorts of charlatans. After all, nobody „expected the Spanish Inquisition" ...

## Volume I. The name.

We pay a lot of attention to the surnames we have. The surname is an anchor on the raging waves of life's history. When thrown back, it allows for a moment of reflection and rest, reminding us of the home port from which we set out into the world. This is no different for Nicolaus Copernicus. In search of the beginnings of the Copernicus family, it is surprisingly helpful to examine Mendeleev's periodic table of elements. The key to understanding the surname of the astronomer lies at the symbol of Cu, meaning 'copper' (in a nod to its abundance on the island of Cyprus), or 'Kupfer' in German. It inspired many village names where it was mined, as well as of people working in metallurgy. Copper miners and traders would often live in a village called Koppering, themselves carrying the surname Coprnik, Copirnik, Koppirnik, Koppernik, Kopernik. Cuprum, Kupfer, and Kopernik. That was more or less how it all began: Nicolaus's ancestors were steelworkers and merchants. Although many researchers have associated the surname with a specific village near Nysa, it should be noted that the Kopernik name occurred in practically all Silesian cities. Today, the „Slovak trail" is taken seriously in this regard, because it is an area in present-day Slovakia that was famous for its plentiful copper deposits. Waves of colonisation pushed the Kopernik family eastward, and before long, besides Silesia, The royal city of Cracow [1] became a Copernican family home town.

## Volume II. Toruń, „The Queen of the Vistula"

His trade requires that the merchant keep his fingers constantly on the pulse of the arteries of business. It is a dynamic world where the privileges of foreign buyers hinder his, while his impede the foreigners'. Toruń [2], on the eve of the birth of Nicolaus, is a great city. Still the most resilient, still powerful, still on the elite list of powerful emporia, her best days are nonetheless already behind her. The great Flemish trade is slowly diminishing in lustre. There are also obstacles on the routes from Ruthenia to Hungary. The city tries to maintain its leading position, reserving the warehouse rights for all goods exported from Poland to Gdańsk. These rights are not just polite requests addressed to foreign buyers. They are a matter of life and death and thus defended as such. In practice, merchants transporting goods from Cracow to Gdańsk are obliged to display and sell them in Toruń at much lower prices than they would get on the Motława River. The difference constitutes, of course, earnings for the local merchants. This state of affairs finds no favours with the foreign traders who bypass, or rather try to avoid, Toruń's Stapelrecht. However, the „Queen of the Vistula" then sends out armed troops to intercept and confiscate the contraband goods.

The merchant soul must be tinged with cunning. Its machinations rattle like the coins poured from a saddlebag onto the heavy oak tops of bankers' benches. Nicolaus Sr., [3] the astronomer's father, appeared in Toruń one beautiful day out of such shrewd motives. To bypass Toruń's trade laws, the Cracovians had two options. The first, practised for many years, was the creation of joint ventures with „them". The second one, with better chances of success, was to send „yours" to „them", to have „yours" there, yet also keeping „yours"

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in Cracow, thanks to which everything is kept in the family. This is how the father of the future astronomer is sent to Toruń to get local citizenship there and successfully help his Cracow kin in avoiding the costly restrictions. By 1458, he had become a citizen of the „splendid city of Toruń".

As is commonly known, in those times, marriages were usually arranged (though even this did not protect against romance). Nicolaus Sr. was no longer a youthful boy, but now thirty-ish – by no means the end of the world, especially when it is accompanied by a very stable financial situation and a group of influential friends. Probably thanks to these, he met Barbara Watzenrode in the first place. She was the daughter of a great and wealthy family, and the plan to marry a Kopernik into an old and established Toruń family was about to be realised.

## Volume III. A difficult childhood, formation, and inspiration.

Torun's „raison d'être" requires that Copernicus be connected to every single brick and worn-out stone. He walked around here, he mused over there; here he fell in love for the first time, and there he observed the port's activity. All this is quite possible, as it happens, because he must have mused, strolled, fallen in love, and the port with its hustle and bustle is always the likely object of a child's observation. However, we do not know anything for certain. This is quite a typical problem when dealing with the greats of history, the fruits of whose memorable work were saved, but not the tales of their private daily lives. We are therefore condemned to guessing, even from the moment we want to direct our steps towards the home in which Copernicus came into this world. [4] Tradition, or rather the reluctance to upset tourists, leads to today's Copernicus Street: the numbers 15 and 17. This house was indeed owned by the father of our famed sky expert, but it is very likely that young Nicolaus came to the world at 36 Old Town Square. The tenement house there was one of the most prestigious addresses of Toruń in the 15th century. The house was called „glazed", due to the glassy, shimmering fittings in its façade, and already half owned by the Watzenrodes. Copernicus relic fans can also boast his baptismal font in St. John's cathedral. It was there, in the parish church of Toruń's Old Town, that Nicolaus received his first sacrament, and the vessel (by some considered as old as the city itself), stands here to this day. The question of whether or not here, in Toruń, Nicolaus already became interested in the rules governing the sky, never gets old. There are a few indications that his cosmic interests started in his home town, starting with the fact that from the very beginning, young Nicolaus received a very solid education at the parish school near the Old Town church. The school at St. John's, like its branches in other large Hanseatic cities, provided stable education at the highest level. In this context, rector Konrad Gesselen seems to have been key: this outstanding and thoroughly educated person left an extremely rich library behind, in which a broad astronomic interest was evident. Thanks to the rector's legacy, Nicolaus was able to read the works of Pierre d'Ailly, Gerard of Cremona, and Johann Danecnecove.

In order to give these arguments a dose of panache and romance, it is worth mentioning the solar eclipse that took place in March 1485. It coincided with the Grand Master of the Teutonic Order's visit to Toruń, where he met Kazimierz Jagiellończyk himself. Such a cosmo-political conjunction simply had to ignite the imagination of a twelve-year-old... The eclipse of the Sun was observed by Copernicus as a half-orphan. Nearly two years before, Nicolaus Sr. had died, leaving behind his wife and four children (Katharina, Barbara, Andreas, and Nicolaus) who remained under the care of their mother. The family found themselves in a rather unenviable position. Being at the peak of his prosperity, Nicolaus Sr. had entrusted expensive goods to a certain Bertold Becker, under whose care, copper worth nearly three hundred grzywna was lost along with the organiser's ships, presumably sunk. It is a bitter joke, therefore, that Nicolaus Sr. „melted" a considerable fortune into this joint venture, when Becker went bankrupt, dragging many Toruń patricians with him.

The mother's brother, Lucas II Watzenrode, [5] the later Bishop of Warmia, took care of the children, in particular of the education and careers of the two boys, making sure that they would continue their schooling into adulthood.

## Volume IV. In the universities of Cracow and Italy.

Uncle Lucas was a most extraordinary and important figure. His origin, extensive interests, wealth, and private involvement made him one of the most important people in the country. Of course, such an elevated position is never free from trouble. As luck would have it, this trouble included the king, but these tense times dissipated momentarily with the king's death, and Jan Olbracht's ascent to the throne. From public enemy number one, Watzenrode became a close adviser and aide to the new monarch. And this was a good thing, because Andreas and Nicolaus, who had failed a year earlier, were now able to enrol at the prestigious Cracow Academy.

Cracow at the end of the 15th century is a pulsating centre of science and culture; the heart of the Crown. It is here that Nicolaus attends classes by Marcin Bylica from Olkusz, the court astrologer of the Hungarian kings, as well as by Jan of Głogów and Wojciech of Pniewy. The latter's research, in particular, could have influenced the thought of Copernicus. It is a time of intensified reading and early research and calculations, from which a few cognitively blind alleys of the Ptolemaic system are emerging. One of them is the difficulty in explaining certain irregularities of the movements of celestial bodies. The Cracow studies end quite rapidly as the brothers leave the city without their master's degrees.

Bishop Lucas has serious plans for his pupils. He wants them to become canons of the Warmian Chapter. It is all possible, although it requires some time and trouble, and when, finally, after two years of bickering, the monks finally agree to welcome Nicolaus in their circle, he has been enjoying himself in far and sunny Bologna for some time. For the malarial Warmian swamp, the right time will come, but not yet. I do not think the Bologna of that period can be adequately described, full of splendour and pompous scholars. The young Copernicus's mighty protector has envisaged his future here. Bologna, however, turns out to be not only a *master degli studii*, but also a true garden of earthly pleasures! The local cuisine is famous throughout Europe: *cotichini* sausages, *mortadella*, *tortellini*, and *capelletti* – cakes made of corn flour and chestnuts. With great zest, the brothers seize all the opportunities the city present, so they run out of funds soon enough. This emergency is averted as the envoy of the Warmian Chapter, Bernard Sculteti, visits the young men to guarantee a loan of another hundred ducats. They can keep studying! Andreas eventually brings back a personal souvenir from those times, which will forever remind him of the 'mother of all studies'. Opulent Bologna in some unfortunate encounter gives him lepra, of which he will suffer later for many years, and of which he eventually dies. Meanwhile, Nicolaus, like a real Renaissance Man, manages to reconcile productive work with entertainment, pleasantry with usefulness. In these years, thanks to his acquaintance with Domenico Maria de Novara, he masters his scholarly skills.

The jubilee year of 1500, when Rome is celebrating the victory of Pope Alexander VI, finds Copernicus in the Eternal City. Here, he gives his first public lecture, [6] which attacks the Ptolemaic system. This is a time of intensive learning for Nicolaus: he now tarts medical studies in Padua. He never gets his degree, but he will eventually practise this profession. The year 1503 crowns many years of efforts when he obtains a doctorate in canon law. He does not take the bar in Bologna, where he began, but in Ferrara – it is cheaper there, simply, and even protégés of bishops have to watch their expenses.

## Volume V. Warmian retreats. „Machina mundi" and other challenges.

Bologna, Padua, and Ferrara, so full of life, contrasted radically with Warmia. As long as Watzenrode was still alive, Copernicus took care of him as episcopal physician. He settled in Lidzbark. During his medical practice, he completed his Commentary on the hypotheses of celestial movements. Bishop Lucas's death closed the Lidzbark chapter and Copernicus moved to Frombork, [7] then Olsztyn, [8] where he continued research and writing on his life's work. *De revolutionibus* was commenced from the turn of 1514 and 1515. Perhaps one of the incentives to undertake increased scientific work was an invitation by Paul of Middelburg. In it, he asked the astronomer, alongside other well-known mathematicians and cosmological experts, to take up the papal challenge and contribute to the reform of the calendar. Middelburg would finally criticise Copernicus' findings, but still today we can see a „tool" with which Copernicus was conducting his research and calculations. It is a plaque painted on the wall of Olsztyn castle. Apart from the seemingly boring and laborious science, difficult to follow for the uninitiated, he also undertook some boring duties, yet in aid of „real guys". Olsztyn owes Copernicus its heroic defence, as was asserted at the time, against the Teutonic army. The fact remains that Nicolaus openly assured the Polish monarch his devotion and loyalty, while indicating that he was ready to pay the highest price. At the request of Copernicus, two wagons of arquebuses were brought in from Elbląg, but the Teutonic Knights changed their war plans, so the whole matter went awry to some extent, and Copernicus's letter to the king never arrived. He spent his peak years in Frombork, all the time working on his heliocentric theory. Although his book was still a manuscript and not even finished, the circles who took note of his concepts were widening and widening, arousing the curiosity of his contemporaries. In addition, he lived the prose of canonic life: the management of capitular property, peasant settlement in free farms, care for the affairs of the diocese. In a word – boredom!

There is one thing here that, just like his work on the nature of the universe, deserves our attention. It concerns Copernicus's ideas about mint. Here, Nicolaus showed his intuitive genius: inferior coins displace the good ones from circulation: a coin with a lower ore value stays in circulation longer, while the better ones immediately disappear, [9] to find a place in a sock or under the mattress of money hoarders. It is problematic when the nominal value does not correspond at all to the monetary value of money, or when money is constantly stuck.

The example of Georg Joachim de Porri (Rheticus) illustrates the power of competent and friendly popularisers. If not for them, the work of several decades of Co-

pernicus's life would have remained in a drawer for a long time. Rheticus, although he had come from Wittenberg, could not count on Luther's support, who had clearly said, as regards Copernicus, that some fool wants to overturn the entire art of astronomy! Joachim, however, understanding the importance of the Copernican discoveries, urged Nicolaus to quickly release his work. Even before *De revolutionibus's* first copies had left the Nuremberg publisher, Rheticus's writings had circulated, bringing the unusual thoughts of the humble canon, the son of a Toruń merchant, closer to the public.

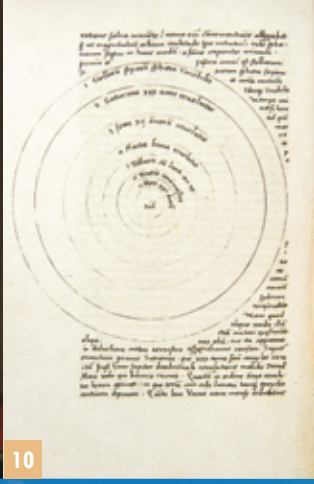
## Volume VI. Legend.

For understandable reasons, the figure of Nicolaus has become the stuff of legend. Some of them border on slander, others focus on naive admiration without reliable research, yet others epitomise a calculated lust for publicity. Let's focus on the ones that tantalise. A romantic tale goes that on his dying day, 24 May 1543, with screeching wheels and in clouds of dust, a speeding carriage braked before the Frombork canon. The carriage transported *On the Revolutions* [10], still warm from the Nuremberg printing house. Copernicus took the book in his tired hands and then gave up the ghost. So much for the legend, although it must be admitted that where normalcy would do for any ordinary man, Copernicus's life deserves the exceptional. If a talented screenwriter had just sweated on a script about Copernicus, he could have raised this legend to the power of pathos, putting in the astronomer's mouth the words, blasted with his last remaining breath: *Sol omnia regit*! And then our hero would expire. That would be something.
When Napoleon Bonaparte visited the city, he asked his guide where Copernicus was born. The man did not know this, of course, but the professionalism and seriousness of his role as the Emperor's city guide required him to say something. Thus, a building in the city became the home of Copernicus, yet in reality had had nothing to do with the astronomer or his family. For the next decades, pilgrimages ended in this building, which even Chopin was made to believe was the genuine article. Yet we must thank Napoleon that the figure of Nicolaus from Toruń and his brilliant achievements were dusted off for good. The Emperor himself ordered, in front of the entrance to the random tenement house (today's 40 Copernicus Street), to erect a monument in the form of a well, crowned with an astrolabe. Before this idea he had been carried away by the stories of said talented guide, who even wanted to sell him the canopy bed in which Nicolaus was born. Anyway — thanks to this great man with the stature of a schoolboy, every child today knows who Copernicus was.

## Post scriptum

In order to fully understand the genius of Nicolaus Copernicus, we must take note of the fact that already a millennium-and-a-half before he was born, heliocentricity had been suspected. Aristarchus of Samos had posited the sun in the centre, though without stronger foundations than his own personal hunch. True science begins only when brave intuition fertilises rigorous and disciplined research. This was the case with Copernicus, who only presented the idea in the first of six books. The others are made up of dozens of years of work, full of advanced calculations in the field of astronomical mathematics that ultimately confirm the ingenious, intuitive brilliance of the heliocentric idea.

Such was the novelty and shock after Copernicus' publication that it was included in the Catholic Church's *Index* of prohibited books until the 1820s.



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