

Three Letters on Copernicus published by Joannes Broscius in 1618

Jan Chroboczek

Institut de Microélectronique, Électromagnétisme et Photonique, MINATEC
3, Parvis Louis Néel, 38016 Grenoble, France, E-mail: chrobocz@enserg.fr

ABSTRACT

In 1618 *Joannes Broscius* [Jan Brożek] edited and published three letters on Copernicus: (1) from Tiedemann Giese to Georg Donner, (2) from Giese to Georg Joachim Rheticus, and (3) from Adalbert Caprinus to Samuel Maciejowski. These letters were found in Kraków [Cracow]¹ and printed there, together with two epigrams, in a 10-page long, untitled and undated brochure (henceforth referred to as “Three Kraków Letters”, (3KL). The latter was later incorporated into a single volume comprising several publications of Brożek, printed between 1615 and 1620. The volume is preserved at the *Biblioteka Jagiellońska* [Library of the Jagiellonian University, Kraków] and is listed in the catalog (No. Cim. 1318-1323) under the title “*Epistolae ad naturam ordinarum figurarum plenius intelligendam pertinentes*” [Letters pertaining to a fuller understanding of the nature of regular figures] and assigned the printing date of the latter, namely 1615. Because of this inscription in the catalog several subsequent publications, including an important recent reference book, *Nicolaus Copernicus Gesamtausgabe* [Nicolaus Copernicus, Collected Writings] Volume VI.1, incorrectly ascribe to the 3KL the title “*Epistolae ad naturam...*” and the publication year of the latter, i.e. 1615. That date should be revised to read 1618, for the following two reasons. First, Brożek encrypted the date of the 3KL publication in its text, using the Julian period formalism, which translates to year 1618 in the Gregorian calendar. Secondly, Brożek announced in the 3KL his imminent departure for Frombork [Frauenburg] in Warmia [Varmia, Ermland], known to have taken place in the summer of 1618. A discussion of Brożek's contribution to Copernican studies, given in this paper, is supplemented by a brief description of his work on mathematical sciences and astronomy.

¹ Names of towns and other toponyms are provided in the form used in languages of countries where they are now. At their first occurrence the form used in English is given in square brackets. Example: Nürnberg [Nuremberg]. For less frequent toponyms, often having no English equivalent, or rarely used, German form is used, example: Braniewo [Braunsberg].

Introduction

The purpose of this paper is to bring to the attention of Copernicus biographers some errors in the citing of a short publication of *Joannes Broscius* [Jan Brożek], (1585-1652), mathematician and astronomer, professor of *Academia Cracoviensis* (now Jagiellonian University, Kraków²). That publication comprises three letters on Copernicus that Brożek located in Kraków, edited and printed. For convenience we shall henceforth refer to that publication as Three Kraków Letters (3KL). The 3KL contain (1) a letter from Tiedemann Giese to Georg Donner, (2) from Giese to Georg Joachim Rheticus, and (3) a dedication letter to bishop Samuel Maciejowski of a treatise entitled “*Judicium Astrologicum*” [Astrological Jurisdiction, or Astrological Prognostication] by its author, Adalbert Caprinus, professor of *Academia Cracoviensis*.³ Brożek wrote in the introduction to the 3KL that he had them printed just before his travel to Warmia [Ermland], in quest for Copernicus's heritage. It is now well documented that the trip was undertaken in the summer of 1618 thus the 3KL must have been published a few months earlier in the same year. Nonetheless, several authors continue dating the 3KL as of 1615 and attribute to it an incorrect title “*Epistolae ad naturam ordinatarum figurarum plenius intelligendam pertinentes*” [Letters pertaining to a fuller understanding of the nature of regular figures] that was indeed printed in 1615 (cf. Refs [1-3], not exhaustive). We argue that the errors in the dating of the 3KL and the referring to them as “*Epistolae ad naturam...*” stems from the fact that the latter and the 3KL were bound together in a single volume, probably by Brożek himself. That volume was later rebound several times and at some stage the title “*Epistolae ad naturam...*” was assigned to it. In the

² The name of the University of Kraków evolved in time. In the 1600s it was called *Academia Cracoviensis* [Academy of Kraków] and that name is used here when reference is made to Brożek's times. In mid-1800s it was renamed *Uniwersytet Jagielloński* [Jagiellonian University], that is used here in context of a more recent past.

³ Notes on personalities involved: (i) Tiedemann Giese (1480-1550), bishop of Chelmno [Kulm] and later prince-bishop of Warmia [Ermland], was the closest friend of Copernicus. (ii) Georg Donner (1493-1544) Frombork [Frauenburg] cathedral canon [Domherr], *confraeter* of Copernicus, and one of four executors of his last will. (iii) Georg Joachim Rheticus (1514-1774) was a disciple of Copernicus. He revised the manuscript of *De Revolutionibus* (RD) with Copernicus and supervised its publication at Nürnberg [Nuremberg] in 1543. (iv) Adalbert Caprinus Bucoviensis [Wojciech Koziol(ek?) of Buków] professor *Acad. Crac.* (v) Samuel Maciejowski (1499-1550), bishop of Plock, Grand Chancellor and secretary of Zygmunt August, king of Poland.

frontispiece of the “*Epistolae ad naturam ...*” we read *Officina Andreae Petricovii S.R.M. Typographii (Anno D. 1615)* [Andrzej Piotrkowczyk printing shop, by appointment of His Majesty the King, (Year 1615 AC)]. The volume is now listed in the catalog of *Biblioteka Jagiellońska* [Library of the Jagiellonian University]⁴ under the title “*Epistolae ad naturam ...*” with the printing date and printer's name of the latter.

The letters of Giese published in the 3KL are often cited, cf. [1-14]. The letter Giese sent to Donner on December 8th, 1542 is a reply to a note (not preserved) he received from him on a sudden deterioration of Copernicus' health. In the subsequent letter, sent on the 26th of July 1543 Giese breaks the news to Rheticus about Copernicus' death. The letter also sheds some light on the relations between Copernicus and Rheticus and it shows that the omission of Rheticus in Copernicus' preface to *De Revolutionibus* (DR) has not passed unnoticed by his contemporaries. Secondly, Giese mentions there a biography of Copernicus written by Rheticus and also his early publication on the heliocentric theory. Finally, Giese refers there to his own correspondence with the Nürnberg City Council about the alterations of the DR text that he attributed, incorrectly, to Petreius, the printer of DR.

These letters are important items in the bibliography on Copernicus and it is equally important that they should be quoted correctly.

Content of the Three Kraków Letters

The importance of the 3KL can be best assessed by reading their texts, which we present in this section. The first two of the 3KL, sent by Giese to Donner and to Rheticus were first published, in Latin and Polish, by Jan Baranowski [4] in his annotated edition of DR that appeared in 1854. In 1861 Franz Beckmann [5] published German translations of Giese's letters from the 3KL. In 1873 the Latin texts were reproduced from Baranowski's work by Franz Hipler [2]. Somewhat later, in 1884, J. N. Franke in his

⁴ *Bibiloteka Jagiellońska, Dział Starych Druków* [Section of old printed documents], Catalog No: Cim. 1318-1323.

biography of Brożek [6] discussed the content of the 3KL and their dating. More recently Henryk Barycz and Jadwiga Dianni published Polish translations of the letters in their two-volume selection of Brożek's writings [7].

English translations of the letters of Giese to Donner and to Rheticus can be found in the publications by Edward Rosen (respectively [9] and [10]). Rosen is known from his numerous works on Copernicus and was a co-editor of two versions of Copernicus complete writings. His comments on the Giese's letters ([9, 10]) greatly facilitate the understanding of their texts and deserve being read. Giese's letters are also quoted (often in fragments) and commented upon in publications addressing the general public (e. g. R. Lamont [11], A. Koestler [12], D. Danielson [13], or Dava Sobel [14]). Below we quote Koestler's⁵ translation of the 1542 letter of Giese to Donner. This text (with the opening phrase added) reads as follows,

To Georg Donner:

I was perturbed by what you wrote to me about the poor health of our venerated old man [*Venerabilis senex*], Copernicus. Since he loved solitude even in his healthy days, so, I think, he has few friends to help him with his troubles now that he is ill – although we are all in his debt for his personal integrity and excellent teachings. I know that he has always had you among the most faithful. I beg you, therefore, since his nature is so formed, would you be in the place of a guardian to him and undertake the protection of the man whom we have both always loved, that he may not lack brotherly help in this necessity, and that we may not appear ungrateful to him, deserving as he is. Farewell.

Lubawa, December 8, 1542.

Tiedemann Giese was then bishop of Chelmno [Kulm] and the letter to Georg Donner was sent from his residence at Lubawa [Löbau], located about a hundred kilometers West from Frombork [Frauenburg]. As mentioned, Giese's letter is a reply to Donner's former message, sent earlier from

⁵ p. 185 in “*The Sleepwalkers*” [12]. Koestler's translation captures best the tone of Giese's Latin text, reflecting his remarkable literary talent. We cite his book here also because its entire part (3) entitled “*The Timid Canon*” is devoted to Copernicus. He is presented there not as a pious clergyman, as the tradition wants it, but as a misanthrope and a man coldly pursuing his ends, often at the expense of people close to him (Rheticus or Anna Schilling, his *fornaria* [house keeper]), at the same time docile with his superiors (Dantiscus). Finally, Koestler finds the German-Polish wrangle about Copernicus' nationality totally absurd, arguing that our concept of nationality is incongruent with the Renaissance people mentality and Weltanschauung.

Frombork to tell Giese that Copernicus had fallen seriously ill. Donner, a Frombork Cathedral canon, knew well both, Copernicus and Giese and also knew that they were close friends. In fact, Giese probably was the only friend Copernicus ever had. In the preface to DR Copernicus calls him with rare warmth “*vir mei amantissimus*” [a man closest to my heart]. Giese must have felt the same about the “*Venerabilis senex*” as his letter is written with anguish of a man aware of an imminent disappearance of a close person. He asks Donner to assist Copernicus in whatever he might need, promising in return nothing but his own gratitude. It is a very personal letter.

The English translation of Giese's letter to Rheticus, given below comes from the Commentary section, following the text of *On the Revolutions* published by Edward Rosen in his *Nicolas Copernicus, Complete Works* [10].

On my return from the royal wedding in Cracow [of Prince Sigismund Augustus of Poland with Elisabeth, archduchess of Austria], in Lubawa I found the two copies, which you had sent, of the recently printed treatise of our Copernicus. I had not heard about his death before I reached Prussia. I could have balanced out my grief at the loss of that very great man, our brother, by reading his book, which seemed to bring him back to life for me. However, at the very threshold I perceived the bad faith and, as you correctly label it, the wickedness of Petreius, which produced in me an indignation more intense than my previous sorrow. For who will not be anguished by so disgraceful an act, committed under the cover of good faith? Yet I am not sure whether [this misconduct] should be attributed to this printer, who depends on the labor of others, rather than to some jealous person. Grieving that he would have to abandon the previous beliefs if this book achieved fame, perhaps he took advantage of that [printer's] ingenuousness to diminish faith in the treatise. However, lest the man should escape scot-free who permitted himself to be misled by someone else's deception, I have written to the City Council of Nuremberg, indicating what I thought had to be done in order to restore faith in the author. I am sending you the letter together with a copy of it, to enable you to decide how the affair should be managed on the basis of what has been started. For I see nobody better equipped or more eager than you to take this matter up with that City Council. It was you who played the leading part in the enactment of the drama, so that now the author's interest seems to be no greater than yours in the restoration of that which has been distorted. Provided that this interests you at all, I ardently implore you to pursue this matter with the utmost earnestness. If the first sheets are going to be printed again, it seems that you should add a brief introduction, which would cleanse the stain of chicanery also from those copies which have already been distributed. I should like in the front

matter also the biography of the author tastefully written by you, which I once read. I believe that your narrative lacks nothing but his death. This was caused by a hemorrhage and subsequent paralysis of the right side on 24 May, his memory and mental alertness having been lost many days before. He saw his treatise only at his last breath on his dying day. The distribution of the published treatise before his death will not be an obstacle, since the year agrees, and the day when the printing was finished was not indicated by the publisher. I should like also the addition of your little tract, in which you entirely correctly defended the earth's motion from being in conflict with the Holy Scriptures. In this way you will fill the volume out to a proper size and you will also repair the injury that your teacher failed to mention you in his Preface to the treatise. I explain this oversight not by his disrespect for you, but by a certain apathy and indifference (he was inattentive to everything which was nonscientific) especially when he began to grow weak. I am not unaware how much he used to value your activity and eagerness in helping him. As for the copies of the treatise which you sent to me, I am deeply grateful to the donor. These copies will serve me as a permanent reminder to preserve the memory not only of the author, whom I always cherished, but also of you. Just as you proved yourself to be an energetic assistant to him in his labors, so now you have helped us with your effort and care lest we be deprived of the enjoyment of the finished work. It is no secret how much we all owe you for this zeal. Please let me know whether the book has been sent to the pope; for if this was not done, I would like to carry out this obligation for the deceased. Farewell.

Tiedeman Giese wrote this letter two months after Copernicus' death which is inexplicably long under such circumstances. He must have felt uncertain how to resume his relationship with Rheticus, whose name was conspicuously absent in the Copernicus foreword to DR, as Giese freshly discovered, reading the copy of DR, just received from Rheticus. He justifies that omission rather limpidly, by Copernicus' "certain apathy and indifference (he was inattentive to everything which was nonscientific)". Next he praises Rheticus for bringing Copernicus work to completion with "eagerness". The second copy of DR was probably intended for Donner. Seventy five years later Brożek examined these exemplars during his visit to Warmia and found that in both of them the introduction, where Copernican theory was presented as a hypothesis, was crossed out.⁶ Further Giese writes with indignation that it was the printer's (Petreius) doing,

⁶ As known, that introduction was prefixed to DR by a Nürnberg theologian, Andreas Osiander, who supervised the last stage of the DR production. He also changed its title, affixing to the original "On the Revolutions" the words "of Heavenly Spheres" that Copernicus had no need for. That was a concept derived from the Aristotelian model of the universe. Perhaps it was Rheticus who crossed out the Osiander's additions in the exemplars intended for Giese and Donner, as some authors

but at the same time suggests, correctly, that somebody else, motivated by jealousy, must have been behind it. Further, he mentions his letter to the City Council of Nürnberg in which he requested an inquiry. That letter was not preserved, but we know that Petreius was questioned by the Council and vehemently rejected the accusations.⁷ Why Osiander's name has not surfaced during those hearings, is not known; we can guess that it was in the printer's interest to withhold the name of such an influential person.⁸ The disclosure of it we owe to Kepler, but that was much later.⁹

Still further, Giese suggests to Rheticus to prepare a new edition of DR and annex to it “the biography of the author tastefully written by you” and also his little tract, where Rheticus “entirely correctly defended the earth's motion from being in conflict with the Holy Scriptures”. Rheticus' biography of Copernicus has not been found so far, but his tract on the alleged incompatibility of the heliocentric theory and the Holy Scriptures, considered lost for a long time, has been recently found. In 1975 R. Hooykaas stumbled across an anonymous “Letter on the Motion of the Earth” published in 1651 in Holland, whose author referred to Copernicus as “*Praeceptor*”. Nobody but Rheticus could employ such a term. In 1984 Hooykaas published [15] an extended account on his analysis of the text; it is probably one of the most significant recent contributions to Copernican studies.

Finally, we should mention the first, to our knowledge, English translation of Gieses' letter to Rheticus, by R. Lamont [11]. He published it in 1932, with the following comment: “... it was first published in 1615 by Broscius, astronomer from the University of Kraków”. Once again, Brożek's publication is

maintain (cf. Refs [10] and [13]). However, judging from Giese's reaction on the discovering the undesired addenda, it is quite likely that both Giese and Donner had done that on their own. Note that Giese in his letter to Rheticus makes no reference on that issue, either.

⁷ Cf. “Reading 64” in Rosen [9]

⁸ Osiander was at that time minister at St. Lorenz church in Nürnberg. He commissioned Petreius several times to print texts of his sermons. Petreius used, in turn, Osiander's services for book proofreading. That was also the case of DR.

⁹ Johannes Kepler, “*Apologia Tychoonis (Brahe) contra Ursum...*” [Defence of Tycho (Brahe) against Ursus (Rheimar Bear) manuscript completed in 1601, but published by Ch. Frisch in 1858. The first published statement on Osiander's falsifications appeared in Joannes Kepler, *Astronomia Nova αιτιολογητος seu physica coelestis tradita commentariis de motibus stellae Martis ex observationibus G.V. Tychoonis Brahe* [A New Astronomy, based on Causation or a Physics of the Sky, derived from Investigations of the Motions of the star Mars by the noble Tycho Brahe] Heidelberg 1609.

dated here incorrectly.

As mentioned in the Introduction, the third letter published in the 3KL is an excerpt from a dedication of “*Iudicium Astrologicum*” by Wojciech Koziol z Bukowa [Adalbert Caprinus Bucoviensis] to Samuel Maciejowski, bishop of Plock. One may wonder why Brożek has included it in the 3KL in the first place. He has, because it contains a flattering remark on Copernicus “*qui huius orbis olim hospitio usus est & haecque scripsit in rebus Mathematicis admiranda...*” [who used to live in this town and wrote admirably on Mathematical matters...]. Brożek thought it important enough to be included in the 3KL, as his University was mentioned there and the letter was written in Copernicus' times. The text of this letter was published by Baranowski [4] in Latin and Polish. However, several authors, Jadwiga Dianni, [7] in that number, published the letters of Giese to Rheticus and to Donner alone, just mentioning the Caprinus letter in passing, for completeness. We do the same.

At the end of the 3KL Brożek placed an epigram entitled “*Copernicus de seipso*” [Copernicus on himself].¹⁰ Let us also with it this section on the 3KL contents.

Me genuit Torunna, Cracovia me arte polivit
 Inter habet primos Varmia clara patres
 [A child of Toruń in Kraków ennobled by arts
 I abide now amongst the best of illustrious Warmia]

Genesis of Three Kraków Letters

The texts of the three letters published by Brożek are preceded by a short address to the reader. This part of the Latin text can be deciphered from the first page of the 3KL, reproduced in Fig. 1. Brożek writes there,

¹⁰ It is not clear if Brożek wrote it himself, or reproduced it from some unknown source, attributing it to Copernicus, as the title epigram's title implies.

Ioannes Broscius Curzeloviensis¹¹
Astrologer Ordinary of *Academia Cracoviens[is]* to his Reader.

Rev. Joannes Rybkowicz,¹² professor in *Collegium Maius* of *Academia Cracoviensis*, out of his love for me and for the Mathematical arts, gave me to read the [following] letters of the Most Reverend Tiedemann Giese, bishop of Warmia, many of which were devoted to Copernicus, Mathematician of the highest refinement. I read these letters avidly and found in one of them many complaints on the first edition of the “*De Revolutionibus*” published with bad will. Accept this letter now, my Reader: others [writings] I shall give you when I return from Fraueburg [Frauenburg], if God permits. Farewell.

You will notice that the first page of 3KL, shown in Fig. 1 does not have a habitual form of a Baroque frontispiece, where the title, place and date usually appear, together with an ornate printer's trade mark. Perhaps the entire document was not voluminous enough to justify that. However, the printers trade mark can be readily seen in its last page, shown in Fig. 2. The brevity of the 3KL suggests that Brożek wanted to publish the Copernican documents found in Kraków fast, before leaving for Warmia, as such a trip could be dangerous, even in times of peace. Still in Kraków, Brożek made a considerable effort to familiarize himself with the Copernican documents available there. In his book on Brożek [7] Barycz reproduces the title page of Mulerius' ¹³ edition of DR, with which Brożek traveled all over Warmia. The page is covered with comments and bibliographic details on publications concerning Copernicus. Brożek

¹¹ Latinized name of *Jan Brożek from Kurzelów*. So far we know just one case where his name was written in Polish, namely in the matriculation ledger of the *Academia*. Apparently the young student has not yet latinized his name. The entry is hand-written as *Jan Brożek z Kurzelowa*. As the baroque hand-writing is not easily decipherable, a discussion on the spelling of the name (Brożek, Brozek, or still Brzozek) has not yet been concluded. We use here “Brożek”, following Franke [6] and most of Brożek's biographers, e.g. [7]. Controversies also exist as to Brożek's birth year and birth place. It has been now agreed that Brożek was born in 1585 in Kurzelów in *Województwo Świętokrzyskie* [Świętokrzyskie Voivodeship] (province in South-central Poland, capital Kielce). These issues have been recently discussed by Ludwika Szelachowska-Winiarzowa [16].

¹² Jan [Joannes Augustinus] Rybkowicz, (@1580-1636) *Bac. Artium* 1599, Magister 1604, and *Collega Minor*; in 1616 professor and dean of *Fac. Art.* and *Collega Maior* at *Academia Cracoviensis*. Same time *Licent.* of theology, canon of St Anne and St Florian churches in Krakow. Four of his religious writings are preserved and a panegyric (1617) for Szyszkowski, bishop of Krakow. Coauthor of “*Brevis historia Universitatis Cracoviensis*” [Short history of the Krakow University], Krakow 1614.

¹³ Nicolaus Mulerius [Nicolaas des Muliers], (1564-1630) professor of medicine and mathematics at Groningen (The Netherlands). He wrote a short biography of Copernicus that was included in the 3rd edition of DR (see note ending the references).

must have written most of them in Kraków, when he was getting ready for the Warmia trip. He was probably guided in this work by his university colleagues and Rybkowicz, “who gave [him] the letters to read” could very well be one of them. Surprisingly, Rybkowicz is not a coauthor of the 3KL although the letters he owned constitute a major part of the 3KL text. Either he declined the co-authorship to give more exposure to his younger colleague or, as a Catholic theologian, did not wish to have his name being seen on a publication dealing with Copernicus and his work, as DR was already on the *Index* (since 1616). Whatever his motives were, it is regretful, as we could learn from Rybkowicz how he got hold of the letters. The one to Rheticus might have been left behind in Kraków when its recipient was leaving town in 1574, rather precipitately. His possessions were later recuperated by his student Valentin Otho (cf. e. g. Burmeister [8]). We have no clue, however, how the letter to Donner¹⁴ ended up in Rybkowicz's hands.

Note that Brożek ends the introductions to the 3KL with “*Eam nunc Lector accipe, alias [epistolas] Frueburgo reversus...dabo*” [Receive this letter now, my Reader, I shall give you others when... I return from Frueburg (sic !)]. He never published any of the documents he found, although on several occasions he mentioned having found in Warmia “more than 20” letters from Giese to Copernicus, announcing at the same time his intentions to publish them. They probably perished, however some remarks on them can be found as late as the 18th century. For example L. A. Birkenmajer [17] notes that these letters were allegedly seen at Vilnius by a certain “Englishman, Dr. Müller” (sic !) who visited Northern Europe in 1785. Others link them with *Biblioteka Zaluskich* [Library of the Zaluski brothers], destroyed in part, and in part retained in Russia.¹⁵ So far no serious inquiry on the fate of Brożek's papers was made in this direction.

¹⁴ Note that Brożek writes Donner's name on the letter's margin as Donder (in red ink in Fig. 1). The same form appears also in his notes, where we find an explicit comment: “*Donderum nominat Germanico idiomateum, quem latina forma Tidemannus Donnerum vocat*” [Donder is so called in the German language, however Tidemann calls him Donner in Latin].

¹⁵ *Biblioteka Zaluskich* was Poland's first public library (established in mid-1700s). Its fate can serve as an example of destruction of Poland's cultural goods over the two last centuries. It was seized by the Russian troops in 1794 and shipped to Sankt Petersburg to become a corner stone of the library of Catherine II. A part recovered after 1918 was destroyed by the German troops in the systematic demolition of Warsaw in 1944. The remainder is still in Russia and negotiations for its recovery do not seem to progress much.

Commentaries on the content of the 3KL and on other Copernican letters can be found in several entries in Brożek's *Raptulare* [Diary, or Notebook]. Equally dispersed are his notes on Copernicus.¹⁶ Brożek wrote only a brief biography of Copernicus (reproduced by Barycz [7]). The latter also suggests that a biography of Copernicus published in 1627 by Starowolski [19] had actually been written by Brożek, as it contains details that only Brożek could have known.

Brożek and his quest for Copernican heritage in Warmia

Brożek was exposed to the Copernican system by his teacher, Walenty Fontana,¹⁷ who is considered to be one the first scholars in Europe to lecture publicly on Copernican theory.¹⁸ Fontana played an important role in forming Brożek's scientific interests and kindled his fascination by Copernicus and his work. Several authors maintain that Brożek's interests in Copernicus alone inspired him to undertake the trip to Warmia. That is only partially true. First, Brożek was not involved much in Copernican studies until 1618 and, as mentioned, had to take a crash course on Copernican heritage just before his departure to Warmia. Secondly, the trip was not only an expensive enterprise but also complex (funding, itinerary, recommendations to high-level clergy, etc.) which necessitated involvement of people of experience and, above all, influence. Undoubtedly only the Kraków *Academia* would have a capacity of carrying out such extensive query on Copernicus and be motivated enough to do so. But why? Observe that at that time it was already known that the first edition of DR appeared with several alterations.^{19,20} A recovery of the original manuscript of DR, hand-written by Copernicus himself, which we shall call *Autograph*, was

¹⁶ Most of these notes have been assembled, edited and published by L. A. Birkenmajer, cf. pp 652-655 in [17].

¹⁷ Walenty Fontana, [*Fontanus*] (1545-1618) professor of mathematics and astronomy at the Kraków *Academia*. He lectured on the heliocentric system in the years 1578-80. Fontana recognized early Brożek's talents in mathematics and his intellectual capacities, nominating him his assistant (*conciliarius*) during the 5th term of his rectorship.

¹⁸ W. Urban, p. 303 in *Dzieje Uniwersytetu Jagiellońskiego w latach 1364-1764* [History of the Jagiellonian University in the years 1364-1764]. Edited by K. Lepszy, XXI/I, Kraków (1964).

¹⁹ Johannes Kepler was the first to publish (in *Astronomia Nova*, 1609) Osiander's alterations (see footnote 9) That was somewhat later confirmed by Galileo and henceforth gained a wider recognition.

²⁰ See refs [1-6] and p. 84 in the Vol. II ref. [7]), also *The authentic title of Copernicus's major work*, E. Rosen, pp 457-474 in *Journal on History of Ideas*, 4, 1943.

therefore important. The *Autograph* was indispensable for restoring the original text, most likely in view of printing an amended edition of DR in Kraków. We can regard Brożek's publication of Giese's letter to Rheticus as a part of this stratagem. Finally, last not the least, another element motivating *Academia's* research on Copernicus was that it proudly listed him amongst its alumni.

Brożek was a perfect man to send to Warmia on the Copernican mission; had more than sufficient background for carrying it out well, was interested in Copernicus and, in prime of his life (was 33 years old then), he could face potential hardships of the trip. The latter was scheduled for the summer of 1618, after the end of the spring semester. We know it from Brożek's notes; for example during the first leg of the trip, stopping at Gdańsk [Danzig], he wrote “*Gedanii* [at Gdańsk] *5 Augusti 1618*” on a billet received from Peter Krüger [Crugerus].²¹ It concerned a purchase of Kepler's *Astronomia Nova* and referred to a discussion that Krüger and Brożek earlier had on that subject. Later, in the frontispiece of that book (cf. p. 437 in Vol. I of [7]) Brożek noted “*Gedanii, 1618*”, following his habit of marking every new item in his library with a date and place of its acquisition. A similar annotation can be seen on a map of Prussia with which Brożek left Gdańsk heading East, to Frombork, where we read “given to me by Crugerus, 1618”. It was probably a farewell gift from his Gdańsk host. The map turned out to be a much appreciated trip companion of Brożek, as he covered its edges with numerous notes and drew his route on it with a clear, winding red line. More, on its back-side he drafted a report, intended for the rector of *Academia Cracoviensis*, enumerating there all the major events of the trip. He writes that he had duly presented the recommendation letter of the rector to the bishop of Warmia, lists places he visited and documents examined. What is striking in this report is that he emphasizes there, almost obsessively, the failure of locating the *Autograph*. That suggests

²¹ Peter Krüger (*Crugerus*), (1580-1639). Gdańsk astronomer and mathematician. Educated at *Gymnasium Academicum* at Gdańsk [Ganzig] and later at Königsberg [now Kaliningrad], continued his studies in Prague (around 1600) as an apprentice of Tycho de Brahe and Kepler. In 1606 he received a degree of *Magister Philosophiae* from Wittenberg and returned to Gdańsk to teach Mathematics and Poetry (sic!) at *Gymnasium Academicum*. He is best known as a teacher of Johannes Hevelius (1611-1689) whose maps of the moon gave him an international recognition, culminating by the election to the Royal Society of London.

that the principal goal of his Prussian mission was its localization, or even acquisition.²²

Brożek has never published a full account on his trip. Fortunately a fair amount of his notes on the trip survived and it was possible to reconstruct his itinerary and even date its particular segments. More details on it can be found in refs [7, 18, 20].

Having returned to Kraków in the autumn of 1618, Brożek resumed his lectures on mathematics and astronomy at the *Academia* and worked on several publications on mathematics. Suddenly, in 1620 we see Brożek leave Kraków for Padova [Padue] to study medicine. This turn in his career can be attributed to a need for a second degree in science required for obtaining a doctorate in theology, ranking the highest in the university world and Brożek was not a man without ambitions. However, a more plausible reason for his hasty departure is his involvement in actions opposing Counter-Reformation, that intensified in Kraków at that time. Namely the educational system in Poland was entering then a phase of radical changes, linked to the appearance of the Jesuit and later Piarist colleges in the Commonwealth of Poland and Lithuania. The Jesuits, chief opponents of Protestantism, enjoyed a strong support of the Catholic church authorities and the Royal Court. Had Brożek been regarded as an anti-Jesuit militant it would be better for him - and for the *Academia* - that he should disappear from the political scene for some time. Perhaps for that reason the *Academia* granted Brożek, already in January of 1620, an unusually long leave of absence and a permission to depart in the spring. When Brożek was leaving Kraków in May, he was certainly aware that an open confrontation with the Jesuits was inevitable. As we know from his memoirs, he remained in close touch with his Kraków colleagues throughout his entire stay in Padova. More, he witnessed a similar wave of Jesuits' offensive in Italy and knew personally one of their chief adversaries, Cesare Cremonino.²³ Upon

²² The *Autograph* was at that time, as we know now, in the hands of Jan Amos Komenski [*Niveanus*] a Czech philosopher and educator, residing then in Germany.

²³ Cesare Cremonino, [*Cesar Cremoninus*] (1550–1631), professor of natural philosophy at University of Ferrara and later Padova. Enjoyed wide fame not only as philosopher but also as political thinker, known for his anti-clericalism. A friend and rival of Galileo, was an antagonist of the Jesuits, criticizing openly their educational methods and their school system. That element was later used by Brożek in *Gratis* (1625), see below. Brożek called Cremonino “*promotorem in Medicina meum et*

his return to Kraków in 1624, Brożek suddenly finds himself in the midst of a political battle and before long becomes one of its chief militants. He traveled several times to the capital with petitions, wrote pamphlets, one of them²⁴ even stirring popular unrest in Kraków. At some point the very existence of the *Academia* was in peril, but it survived, however its role in Poland's educational system and its prestige strongly diminished. It was one of many small steps advancing the Counter-Reformation in the Commonwealth of Poland and Lithuania, giving the Catholics an absolute supremacy at the end. Tolerance, religious and racial, that used to be one of the driving forces for advancement of sciences and arts in the Renaissance Poland, and its economy, was to yield in the coming century to the reign of obscurantism and xenophobia.²⁵

In May of 1621 Brożek writes a letter to Galileo Gallilei,²⁶ then residing in Florence at the court of the Medicis. This letter is a masterpiece of diplomacy; at its beginning Brożek quotes several less-known publications of Galileo, demonstrating that he kept up with novel developments in science and implores Galileo to publish more “on his system”. That is a note of support in the moment when Inquisition has already opened investigations on Galileo's stance towards heliocentrism. Further Brożek mentions his trip “to Prussia”, where he “found many interesting documents” that he intended “to publish *suo tempore*”. Note that it is another announcement of his intention of publishing documents recovered in Warmia. However, Copernicus' name is not spelled out, no details on the trip are given, but the message is clear: there are people keeping Copernican heritage alive - you are not alone, Galileo.

praeceptorem“ (cf. p. 86 in ref. [6]) and admitted having “learned much from him on the university matters”.

²⁴ Called *Gratis* from the first word of the text. Brożek demonstrated there that the Jesuits claims of offering free (*gratis*) education were false. *Gratis* is a fine example of the XVII century Polish political writings and also shows Brożek's literary talents.

²⁵ It is rarely mentioned that Jan Brożek's brother Adam was a Calvinist. From that may stem Brożek's interest in Kraków Protestants and his fascination by Reticus. In the course of his life persecutions of Polish Protestants intensified, culminating with the expulsion of the Arians (related to Calvinists) from Poland in 1658. Adam Brożek re-converted to Catholicism in 1631 (cf. p. 9 in Franke [6]), probably under pressure.

²⁶ Preserved in the collection of Galileo writings at the *Biblioteca Nazionale Centrale di Firenze* (BCNF) pp 103-104, Gal. 91. Also available via the Web page of the BCNF.

This short biographical sketch on Brożek would not be complete without a word on his mathematics. He is not only considered to be the most eminent mathematician in Poland in his time, but also a mathematician of European recognition, thanks to his significant contributions in the field of number theory and geometry.²⁷ His publications on astronomy show his profound rationalism,²⁸ rare in the times when astronomy (called then astrology) was often tainted with superstition. That did not prevent Brożek from casting horoscopes, but horoscopes and various forms of prognostication were then a part of life. What is striking in Brożek's mathematics is its full immersion in the main stream of European mathematics. In his *Arithmetica Integrorum*, (frontispiece shown in Fig. 3) written for the university students he introduced logarithms, just five years after their invention by a Scottish mathematician, Napier.²⁹ Brożek also described there another invention of Napier,³⁰ a computing instrument called in English “Napier's bones”, that can be used, principally, for fast division and multiplication of integers of practically unlimited length. Brożek had several copies of it made in Kraków, for himself and his colleagues, and widely praised its virtues. That was, in fact, the first digital computing device.

Brożek also built up a considerable collection of books, using every method of acquiring important volumes, as it was the case of Kepler's *Astronomia Nova* that he bought thanks to the good offices of Krüger. Similarly, he obtained the “*Ephemeridae Novae...*” of Rheticus from Philip Müller, mathematician at the University of Leipzig, whom he visited on his way to Padova in 1620. Also what is left of his scientific correspondence is impressive. He was not unique, though, as in the times when scientific journals did not yet exist and book printing was slow, men of science communicated by letters and kept them for

²⁷ Major publications: *Gaeodesia Distantiarum sine Instrumento*, (1610), *Arithmetica Integrorum*, (1620). Consult “Brożek” in the *Galileo Project*. The German reader may find it interesting that Moritz Cantor included a short discussion of Brożek's works in his “*Geschichte der Mathematik*” [History of Mathematics] Vo. II, pp 685-686, Teubner, Leipzig (1900).

²⁸ In *Cometa Astrophili*, (1619) Brożek discusses the nature of comets. Later he corresponded with Krüger on this subject.

²⁹ John Napier of Merchiston (1550–1617), also called Neper, was a Scottish nobleman interested in theology, mathematics, physics and astronomy. In 1614 he introduced logarithms in his *Mirifici logarithmorum canonis descriptio*, [Description of the wonderful canon of logarithms]. Brożek must have lectured about logarithms before 1620, as we can infer from the publication date of *Arithmetica Integrorum* (1620).

³⁰ Described in his *Radbiology*, 1617.

reference. Maintaining lively contacts with the others was essential, but that required an international recognition. Brożek definitely belonged to that exclusive virtual network of European scholars, being, as Müller described him later, “*vir doctissimus in locis exteris*” [the most learned man from foreign lands].

Three Kraków Letters, printing date

In the above, we have deduced the printing date of the 3KL arguing that it should slightly precede Brożek's trip to Warmia, that took place in summer months of 1618. A direct confirmation of that dating can be found in the last page of the 3KL, reproduced in Fig. 2. As we see, the text ends with the line,

$$\textit{Cyclo Lunae 4. Solis 3. Indict: 1,} \quad (1)$$

which can be easily overlooked. It should not, as it presents the year coding in an unusual format, involving a concept of the Julian period.³¹ It involves specifying the year position simultaneously in three time cycles, the Lunar cycle of 19 years, the Solar cycle of 28 years, and a 15 years-long *Roman Indiction* cycle.³² The combination of the three cycles forms the so called Julian period, the length of which is a product of its three constituents, $19 \times 28 \times 15 = 7980$ years. The year 4713 BC was chosen as year 0, for certain astronomical reasons, but mainly in order to encompass all known human history in a single time period. Surprisingly, that is not an outdated procedure; the Julian period dating is recommended now by the International Astronomical Union for precise dating of astronomical events. The reason is that the dating within the present Julian period is unambiguous, and, secondly, more exact, as it can be given using decimal fractions of the year length, with any desired precision. More, in such formalism, computing the time

³¹ Not to be confused with Julian calendar (still used in the Russian and Greek orthodox churches).

³² The first two cycles follow certain astronomical events. The moon phases fall on the same month days after the lunar cycle period of 19 years, similarly after the solar cycle the week days fall of the same month days. Finally, the *Roman Indiction* is a relict from the reign of the Byzantine Emperor Constantine, who ordered that the property census should be carried out every 15 years, and be followed by the tax assessment.

interval between events becomes straightforward. Brożek gave similar arguments presenting principles of the Julian period dating and used it in the publications he considered important.³³

The principle of the Julian period year dating can be explained using our clock as an example. It operates on a principle of restarting the hour count every 12 hours, i. e. when the cycle of 12 hours is completed. In more abstract terms, our clock simply shows a remainder³⁴ of the division by 12 of any number of hours counted from some arbitrary zero-hour time. In mathematics the cycle length is called “*modulus*”, thus 13 is equivalent to 1 (*modulo* 12). Naturally we can construct devices using various *moduli*, as we do using the 24 hour system, to prevent confusion of night and day hours, as in communication timetables. In the Julian period convention not a single dial is used, but three and instead of hours the years are counted. The three clock dials are marked, respectively, with numbers running from 1 to 19, to 28 and 15. For the observer living in year N the dials would show the remainders of divisions $N/19$, $N/28$, and $N/15$. Thus in year 20, for example, our three clocks would show 1, 8, and 5. Conversion of the Julian period year notation into that of the Gregorian calendar consists therefore in finding the number N whose remainders of the divisions by, respectively, 19, 28, and 15 are numbers a, b, and c, appearing in the formula,

$$\textit{Cyclo Lunae: a. Solis: b. Indict: c.} \quad (2)$$

In Brożek's 3KL we have $a=4$, $b=3$, and $c=1$, as we can infer comparing Eqs (1) and (2). Generally speaking, the conversion of dates given in the Julian period coding into the Christian era formalism and *vice versa* is not straightforward for bigger numbers. Brożek devoted several pages in his *Arithmetica Integrorum* to the explanation of his conversion method, which Dianni³⁵ attempted, in vain, to interpret. However Franke

³³ He used the Julian period dating also publishing “*Septem Sidera*” [Seven Constellations] a poem where, allegedly, the Christian names of Zodiac constellations were proposed to replace the antique ones. Brożek found that poem in Frombork and attributed it (incorrectly) to Copernicus. He believed in its importance and even sent it to the pope (on two occasions). The Julian period dating enhanced perhaps in his eyes the transcendental value of *Septem Sidera*.

³⁴ A reminder for those who do not remember what a remainder of a division is. Consider a quotient D/d . The dividend (D) can be decomposed into an integer number, n, of dividers (d) and a remainder R, such that $0 < R < d$, thus $D = nd + R$. Take example of $7/2$, then $7 = 3 \times 2 + 1$, where $n=3$ and $R=1$.

³⁵ Jadwiga Dianni in Vol. II of ref. [7]. As mentioned, Dianni was a historian of science and mathematician. She referred the

(p. 57 of ref. [6]) provides appropriate algorithms and applies them for dating the 3KL, using $a=4$, $b=3$, and $c=1$ given by Brożek, arriving at 1618 AC. Later Birkenmajer, (footnote to p. 666 of ref. [17]) does the same, without a comment. Note that both, Franke and Birkenmajer do not find it worthwhile to comment on the usage of the Julian period formalism, as if that issue were trivial.³⁶ If you examine closely the last page of the 3KL shown in Fig. 2, you will readily see a penciled “=1618” appearing under the line specifying the Julian period year dating. It might have been Franke, or Birkenmajer who wrote that, but it matters little, the essential is that the various dating methods of the 3KL converge on the year 1618.

Three Kraków Letters, unfortunate citation

Ludwik Antoni Birkenmajer summed up most what was then known on the letters of Giese to Copernicus in his “Mikołaj Kopernik”.³⁷ He observes that the 3KL have been saved thanks to Brożek, emphasizing at the same time that he published them in 1618, saying in a footnote, “[Published] not in 1615. That [3KL] is a part of a compilation [*składka*] comprising also the ‘*Epistolae ad naturam ...*’ published by Brożek in 1615.” Clearly, Birkenmajer anticipated the risk of confusing the publication date of the 3KL with that of the “*Epistolae ad naturam...*”. It is impossible, of course, to establish now how the catalog entry of the book that Birkenmajer referred to looked like in the late 1890s, when he was writing his “*Mikołaj Kopernik*”, but it is very likely that it has not been changed since. The consecutive, and possibly former, errors originated from the unfortunate formulation of the catalog entry. In fact, only those authors who

reader to treatments of similar problems via methods of modular arithmetic. Example: Denote by m the length of the cycle (modulus). Then any integer x can be expressed writing $x \equiv n \pmod{m}$, e.g. $13 \equiv 1 \pmod{12}$. Tables with results of arithmetical operations on modular numbers can be used for conversion purposes. Brożek mentions them in the context of the dates but admits that the tables have limited applications and subsequently gives his own general method that he called “*divination*” [guessing]. It consists of using certain properties of integer numbers combined with a good measure of intuition stemming from experience in studying properties of integer numbers, in which Brożek excelled.

³⁶ An approach involving modern modular algebra methods will be discussed elsewhere, as it is out of scope of this article. For computation purposes the reader may want to use one of numerous computer programs available on the Internet network.

³⁷ Cf. p. 666 ff, in “Mikołaj Kopernik”, ref. [17].

could directly consult the volume in question at the *Biblioteka Jagiellońska* (such as Franke and Birkenmajer) quoted the 3KL correctly. The conclusion is rather obvious, the catalog entry should be now disambiguated. The inscription of the volume's spine reading "*Toannes Broscius. Arithmetica Integrorum et alia*" seems to describe rather adequately its content. For clarity, here is a summary of the recent examination of both, the volume comprising the 3KL and its catalog calling card (now also available in digitized form).

The volume in question is preserved in *Dział Starych Druków* [Section of old printed documents] of the BJ and bears the shelf number Cim. 1318-1323. It is described in its catalog as a "klocek"³⁸ entitled "*Epistolae ad naturam ordinatarum figurarum plenius intelligendam pertinentes*", printed in 1615 in the shop of Andrzej Piotrkowczyk [*Andreas Petricovius*] in Kraków. That agrees perfectly with what Birkenmajer wrote on its publication year and the title, adding that the latter is misleading as it refers to the "*Epistolae ad naturam...*" alone. Further we learn from the catalog that the volume used to belong to Jan Brożek. The leather cover of this small (10 cm by 17 cm) volume bears a title line impressed at the top "*Trigonometriae CRV*" and a stamped ornament (Madonna with child?) can be seen in the cover's center. Incomplete brass clips are attached to the right edge of the front cover. All these items suggest that the cover was recuperated from some other book by the book-binder who, having left the former title intact, added "*Toannes Broscius. Arithmetica Integrorum et alia*" on the book's spine. The volume is stored in a box together with a page with signatures of the readers with the dates of the volume's viewing, running from the mid 1800s. Partially destroyed front edge paper (*verso* of the front cover) contains, on the left, several hand-written notes (possibly Brożek's) not yet commented on. On the right-hand side of the same front-edge page a small

³⁸ In the book-binder's jargon "*klocek*", (pron. klotsek, a toy building block in Polish) is fabricated by pressing together a stack of various, often disparate documents and trimming its edges, so as to give it a form of a single volume. Because of the inherent diversity of its content, titles of book-blocks may be misleading, as it is happened in the discussed case of Brożek's "*Epistolae ad naturam ...*". Birkenmajer does not use "*klocek*" which has an argotic tint for him, preferring a word "*składka*" meaning simply a pile or assemblage. We use here the English "book-block"; its German equivalent is *Buchblock*.

paper sheet is attached with a brief history of volume's binding. It is signed with the initials A. B., which, according to the BJ librarians, stand for Alexander Birkenmajer.³⁹

It is highly probable that the entries in the catalog have been written much earlier, before Birkenmajer's times. That could explain the errors in quotations of the volume by other authors who had no direct access to the original.⁴⁰ Note that the volume's title on its spine reads “*Joannes Broscius Arithmetica Integrorum et alia*”, which, as we suggested, was probably impressed during its last re-binding in 1937. On that occasion the publications were re-arranged, and, according to the binding history, some of them, that were not of Brożek's authorship, were transferred elsewhere. The title on the spine repeats the first line of the front page of *Arithmetica Integrorum*, appearing now as the first in the sequence of publications bound in the volume. Their list is given in Appendix 1 for reference.

We can guess that the title of “*Epistolae ad naturam ...*” was used as the title of the whole volume because that very publication appeared first in the sequence of documents constituting the book-block. Note that “*Epistolae ad naturam...*” is now at the fifth position. Also note that the spine text “*Joannes Broscius. Arithmetica Integrorum et alia*” stems from the first page in the volume which is a frontispiece of *Arithmetica Integrorum* (single page). The same logic might have been used by the former book-binder and followed through by the BJ librarian.

The last issue we should address is the content of the “*Epistolae ad naturam...*”, in order to make it clear that this publication has nothing to do with Copernicus and his work. In “*Epistolae ad naturam ordinatarum figurarum plenius intelligendam pertinentes*” [Letters pertaining to a fuller understanding of the nature

³⁹ Historian and philosopher, author of numerous publications on Copernicus, son and collaborator of Ludwik Antoni Birkenmajer, quoted several times in this paper (cf. Ref. [17]).

⁴⁰ In 1873 Franz Hipler writes in p. 353 of his “*Spicilegium Copernicanum*” [2]: “*Dieser wie auch der folgende Brief vom 26 Juli [1543] sind von Broscius in einer im J. 1615 edirten, mir nicht zugänglichen Schrift...zuerst edirt worden*” [This and also the following letter of 26th of July [1543] have been first edited by Broscius and published in 1615 that has not reached me] (underlined by JC). In other words, Hipler has not, or could not consult the original texts of the 3KL.

of regular figures] Brożek published two of his letters to van Roomen⁴¹ (one dated on October 1, 1610, the other undated, both translated and published by Dianni [7]) together with a letter from van Roomen to Brożek. Note that in 1610 Brożek was aged 25, and has just become *magister* and van Roomen was already a mature mathematician, in his fifties, known in most prestigious centers of science in Europe. That created a disciple--teacher relationship between the two men and Brożek mentioned several times that he benefited much from contacts with van Roomen. Brożek published the “*Epistolae ad naturam....*” in 1615 when the news of van Roomen’s death reached him. The frontispiece of “*Epistolae ad naturam....*” from the BJ exemplar is shown in Fig. 4.

Conclusions

As we have shown, the 3KL are widely cited; more precisely Giese's letters, because they tell us much about the last years of Copernicus life, so important in the final stage of editing of *De Revolutionibus*. Unfortunately, the majority of the 3KL citations in the literature are erroneous. In fact, correct are only those written by the authors having direct access to the *Biblioteka Jagiellońska* volume, comprising Brożek's 3KL. Recent re-examination of that volume clearly indicated that the mistakes originated from an imprecise entry penned on the card catalog of *Biblioteka Jagiellońska* by some unknown 18th century librarian. That imprecision (to say the least) soon found repercussions in the literature. It can be traced to Franz Hipler's *Festschrift* published in 1876. Most probably Hipler quoted the 3KL following the *Biblioteka Jagiellońska* entry, but admitted prudently, that he had no access to the original.⁴² That error has been further

⁴¹ Adrian van Roomen (*Adrianus Romanus*) (1561-1615) professor of mathematics at Louven and Würzburg. Author of several fundamental works on algebra (theory of linear equations, where he modernized symbolic notation). His publications on geometry were subject of correspondence with Brożek. Van Roomen lectured several times at *Academia Zamojska* [Academy of Zamość], *Hippeanum Zamoscianum* in Latin. The *Academia Zamojska* was an important educational center in South-Eastern Poland where eminent foreign scholars were often invited to lecture. Van Roomen traveled there several times via Kraków (1610-1612). Brożek affirms to have learned much from van Roomen and held him in the greatest esteem.

⁴² L. A. Birkenmajer mentions (p. 658 in [17]) a “prolonged stay” of Franz Hipler at Kraków in the autumn of 1876.

propagated, without such a cautious clause.

To our best knowledge the copy of the 3KL preserved in volume Cim 1318-1323 at *Biblioteka Jagiellonska* is unique, we have therefore no alternative but to quote it as a part of that book. The best way to do it would be to indicate its location (such as a page number) in a volume comprising a collection of Brożek's writings. It should be entitled “*Jan Brożek. Arithmetica Integrorum et alia*”, as stamped at the book's spine. The year 1618 as a publication year of the 3KL, has been established by Franke, confirmed by Birkenmajer and now verified by the present study. Although the printer's name is not mentioned in the 3KL text, it was most probably Andrzej Piotrkowczyk (*Andreas Petricovius*) in whose shop Brożek printed most of his publications. That was concluded from the appearance of the printer's trade mark in the end page of the 3KL (Fig. 2). That ornament (angel's head with wings) appears also in the frontispiece of the “*Epistolae ad naturam...*” (Fig. 4), above the text specifying the place, printers name and the year when that publication appeared. Thus we have assembled all the items needed for an unambiguous catalog record of the Three Kraków Letters.

It may seem preposterous to suggest amendments in the time-honored entry appearing in the catalog, but the Librarians of the *Biblioteka Jagiellońska* may want to take this opportunity to correct the imprecision their colleague committed some two centuries earlier.

Apparently Hipler had no opportunity of examining the BJ volume in question. It is indeed a pity; the chain of errors could have been broken then.

Acknowledgements

I wish to thank the director of *Dział Starych Druków*, [Section of old printed documents] of *Biblioteka Jagiellońska* Dr Małgorzata Galuszka-Wacek, for making the original publications of Brożek available to me and her permission for their partial publication. I am obliged to the reading room librarians for their help in interpreting the texts and providing photocopies of several consulted documents. I am also grateful to Dr Grażyna Kubica for facilitating my contacts with the library and to Ms Katarzyna Koziol (*de domo* Sobieraj) for the speedy expedition of the document scans. I owe special thanks to Prof. Andreas Kühne, (Ludwig Maximilians University at Munich), for his helpful remarks on the manuscript, suggested corrections, and also for indicating to me several German bibliographic sources. Finally, I have greatly appreciated the help Prof. Paul Ulrich Unschuld, Editor of the “Sudhoffs Archiv” in shaping up this paper.

References

- [1] *Nicolaus Copernicus Gesamtausgabe*, Volume VI.1, *Briefe: Texte und Übersetzungen*, [Letters: Textes and Translations] Edited by A. Kühne, F. Boockman, and S. Kirschner, Akademie Verlag, Berlin (1994).
- [2] *Spicilegium Copernicanum* by Franz Hipler, p. 351, Eduard Peter Verlag, Braunsberg (1873).
- [3] N. M. Swerdlow, *Documenta Copernicana*, SAO/NASA Astrophysics Data System (ADS), *J. Hist. Astronomy*, pp 386-389, **29** (1998).
- [4] pp 639-40 in *De Revolutionibus Orbium Caelestium Libri Sex* [On the Revolutions of the Heavenly Spheres, Six Books] edited and annotated by J. Baranowski, St. Strąbski Publishing, Warszawa (1854).
pp 734-738 in the digital version, available through the home page of the Kujawsko-Pomorska Digital Library.
- [5] *Zur Geschichte des Copernikanischen Systems* [On History of the Copernican system], by F. Beckmann, Braunsberg (1861).
- [6] *Jan Brożek, Akademik Krakowski ...*, [Jan Brożek, Kraków Academician...] by Jan Nepomucen Franke, Jagiellonian University Press, Kraków (1884).
- [7] *Jan Brożek, Wybór Pism* [Jan Brożek, Selected Writings], Eds Henryk Barycz (Vol. I) and Jadwiga Dianni (Vol. II), Polskie Wydawnictwa Naukowe (PWN), Warszawa (1956).
- [8] *Georg Joachim Rheticus, 1514-1574, Eine Bio-Bibliographie* [Georg Joachim Rheticus, 1514-1574, a Bio-Bibliography], by K. H. Burmeister, Guido Pressler Verlag, Wiesbaden (1967).
- [9] *Copernicus and the Scientific Revolution*, by E. Rosen, Krieger Publishing (1984).
- [10] *Nicolaus Copernicus, Complete Works*, Vol. 2, *On the Revolutions*, Edited by E. Rosen, Johns Hopkins University Press Baltimore (1978).
- [11] p. 8 in *A Few Things About Copernicus* by Roscoe Lamont, in „*Popular Astronomy*” Vol. 40 (1932).
- [12] *The Sleepwalkers*, by Arthur Koestler, Macmillan Co., New York (1959).
- [13] *The first Copernican*, by Daniel Danielson, Walker and Company, New York (2006).
- [14] *A More Perfect Heaven*, by Dava Sobel, Walker and Company, New York (2011).
- [15] R. Hooykas, *Rheticus's Lost Treatise on the Holy Scripture and the Motion of the Earth*, *J. Hist. Astronomy*, **15**, 77-80 (1984) and *G. J. Rheticus' Treatise on Holy Scripture and the Motion of the Earth*, by R. Hooykaas, North Holland, 1984.

- [16] *W poszukiwaniu prawdy historycznej, problemy związane z Janem Brożkiem* [In Search of the Historical Truth, Problems concerning Jan Brożek], by L. Szlachowska-Winiarzowa, Lexus Publishing, Kraków (2010).
- [17] *Mikolaj Kopernik, Cz. I* [Nicolaus Copernicus, Part I] by L. A. Birkenmajer, Księgarnia Wydawnicza Polska, Kraków (1900). Cf. also *Stromata Copernicana*, by L. A. Birkenmajer, Jagiellonian Univ. Press, Kraków (1927).
- [18] E. Stamm, *Z historii matematyki polskiej XVII wieku* [From the History of the XVII Century Polish Mathematics], p. 151-157 in *Wiadomości Matematyczne*, Vol. XL, I (1936).
- [19] *Scriptorum Polonicorum Hecatontas* [A Hundred-worth of Polish Writers] by Szymon Starowolski, Venice (1627).
- [20] J. Chroboczek, *Jan Brożek, Mathematician, Astronomer and Biographer of Copernicus*, Polish Review, 169, LV, Polish Institute of Arts and Sciences of America, (PIASA), New York (2010).

Note

References in the text are made to the three early editions of “*De Revolutionibus*”,

- (First) Nürnberg, 1543, edited by Rheticus and Osiander,
- (Second) Basel 1567, edited by Sebastian Henricpetri,
- (Third) Amsterdam 1617, edited under the title “*Astronomia Instaurata*” by Mulerius [Muliers], preceded by his biography of Copernicus.

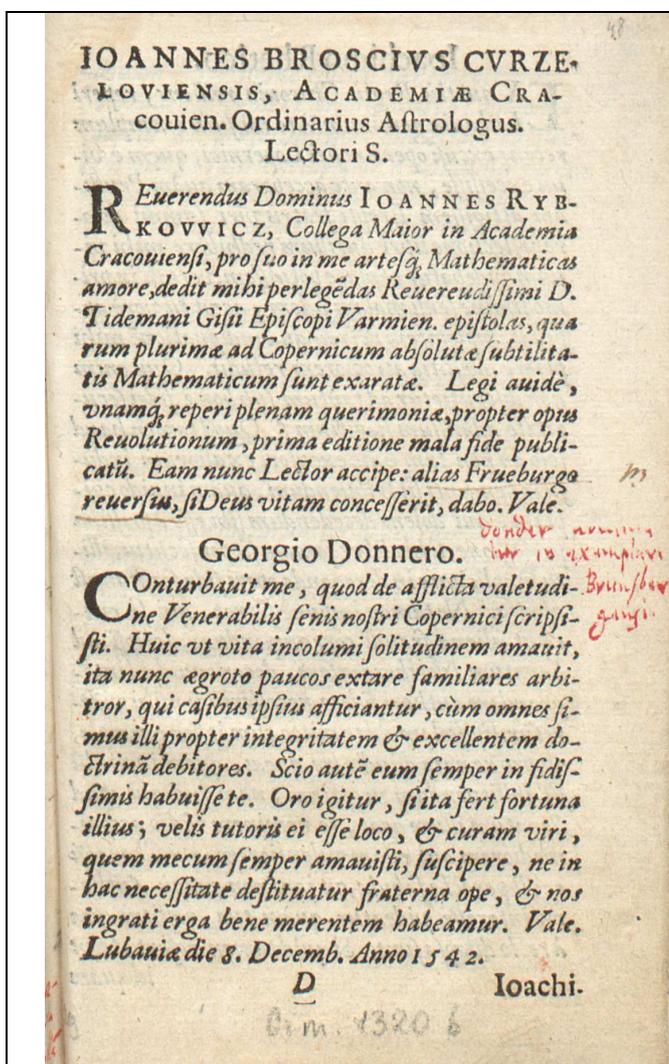


Figure 1. First page of the 3KL. The upper part is an introduction, or an invocation to the reader. In the last sentence the author promises the reader that more letters will become available when the author returns from Frombork. The bottom part shows a letter of Giese to Donner, with a margin note of Brożek “Donder nominatur in exemplari Braunsbergensi”. The 3KL were printed in the first part of 1618 at the shop of *Andreas Petricovius* (Piotrkowczyk) in Kraków. Courtesy of *Biblioteka Jagiellońska* by permission.

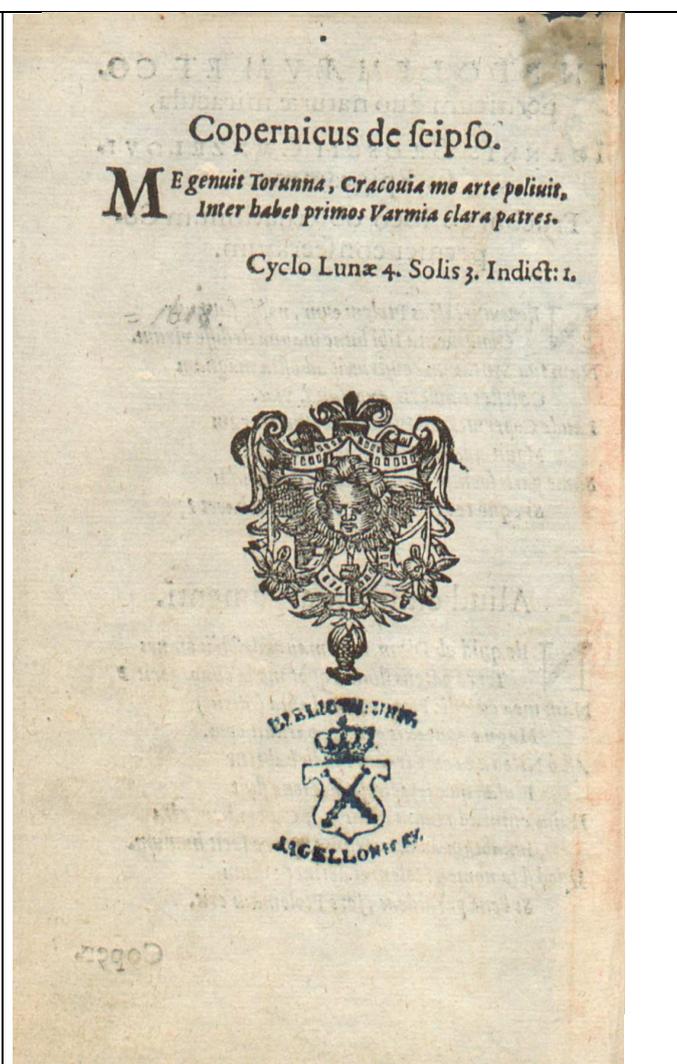


Figure 2. The last (10th) page of the 3KL. The epigram that Brożek attributed to Copernicus can be seen at the top. The line below is the printing date coded in the Julian period format. Its conversion into the Christian era (AC) format gives the year 1618 (see text for explanations). Note that some unknown reader penciled under the Julian dating line the result of its conversion to the AC format (=1618). Courtesy of *Biblioteka Jagiellońska*, by permission.

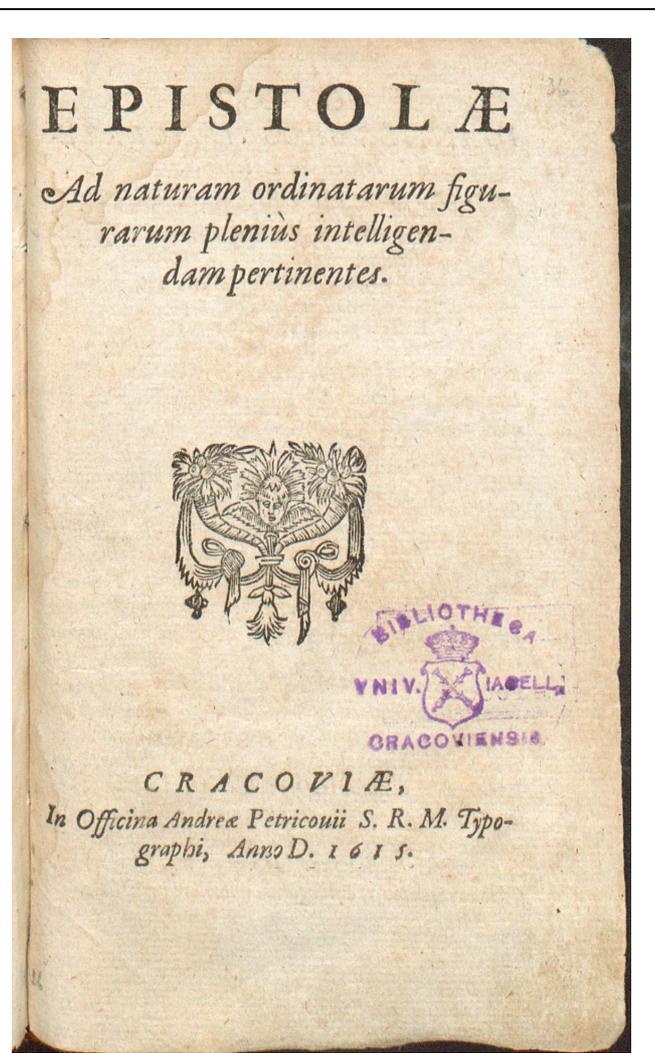
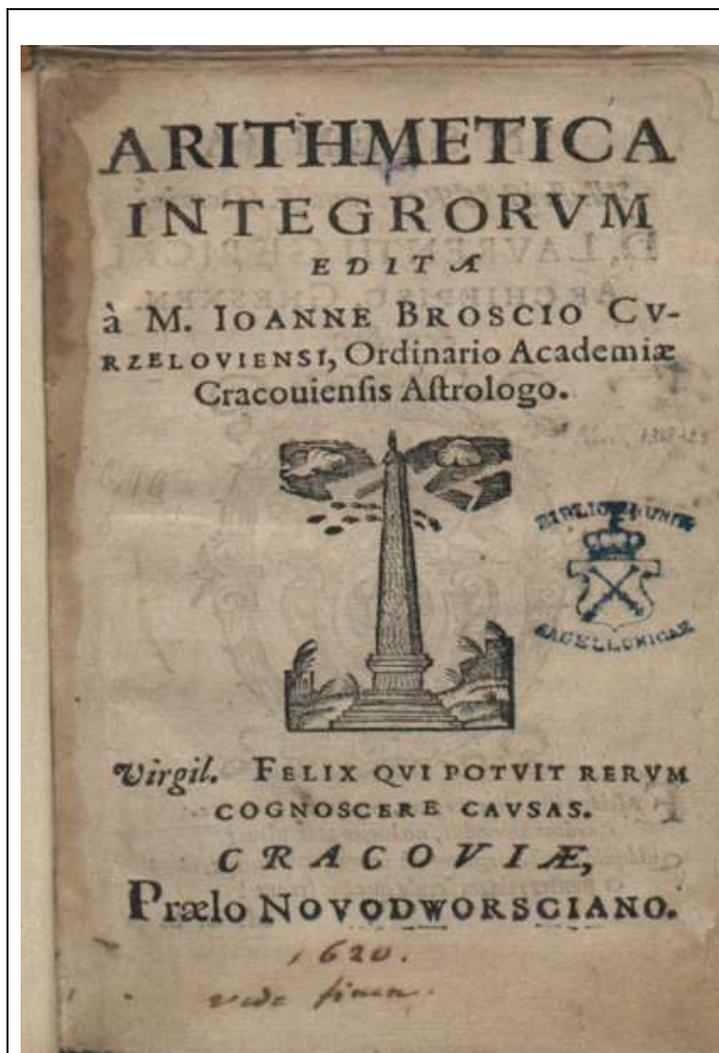


Figure 3. Title page of Brożek's *Arithmetica Integrorum*, call No: BJ Cam. L. XI. 46. The frontispiece of *Arithmetica* is also the first page in the book-block preserved at *Biblioteka Jagiellońska* (Cim. 1318-1323). The title pressed on the volume's spine reads "Joannes Broscius. *Arithmetica Integrorum et alia*", which is more appropriate than the "Epistolae..." used in the catalog. Amongst others, Brożek explained in *Arithmetica Inegrorum* his method of converting the conventional AC year notation into/from the Julian period coding. Courtesy of *Biblioteka Jagiellońska*, by permission.

Figure 4. Frontispiece of a publication comprising letters exchanged between Brożek and van Roomen. Brożek published this tract in Kraków at the news of van Roomen's death, in 1615. Both the 3KL and the "Epistolae..." are bound in the same book-block (Cim. 1318-1323) listed in the catalog under the title "Epistolae ..." with its publication year, i.e. 1615. The 3KL are often cited in this manner, which is incorrect. Note that *Petricovius'* shop sign (center) appears also at the end of the 3KL (Fig 2), hence *Petricovius* must have printed both publications. Courtesy of *Biblioteka Jagiellońska*, by permission. .

Appendix 1

Contents of the book-block Cim. 1318-1323, preserved at *Biblioteka Jagiellońska*, as of December 2011

1. Frontispiece of "*Arithmetica Integrorum*" Kraków 1620 (Recto). Dedication to Rev. Gębicki, archbishop of Gniezno (*Verso*); loose page.
2. Text of "*Arithmetica Integrorum*", Kraków, 1620.
3. "*Dissertatio de Cometa Astrophili*", [Dissertation on the Comet of Astrophilus] Kraków, 1619.
4. "*Epistolae ad naturam ordinatarum figurarum plenius intelligendam pertinentes*", [Letters pertaining to a fuller understanding of the nature of regular figures], Kraków, 1615.
5. "*Dissertatio v. Rebus publicis plus Astronomi quam Geometrae prosint*," [Dissertation on whether the Astronomers contribute more to public welfare than the Geometricians], Kraków, 1616.
6. Three Kraków Letters (10 pages, no frontispiece) Kraków, 1618, comprising
 - letter from Giese to Donner,
 - letter from Giese to Rheticus,
 - letter from Caprinus to Maciejowski (cf. Introduction),
 - Epigram of Brożek entitled "*In Ptolemeum et Copernicum duo Naturae miracula*" [On Ptolemy and Copernicus, two miracles of nature].
7. Epigram attributed to Copernicus "*Copernicus de seipso*".
8. A woodcut fold-out, reproducing a commemorative plaque funded and installed in 1581 at the Frombork Cathedral by Marcin Kromer, bishop of Warmia (1512- 1589).⁴³
9. Two pages of minor printer's notes.

⁴³ The original plaque has been removed and is probably lost. The fold-out, considered unique, reproduces the text transcribed by Brożek from the original. It was probably added (by him?) to the book-block volume after the Warmia trip. The text reads: *Nicolai Copernici Epitaphium Frueburgi in Memoria Tabula* [Epitaph Plaque of Nicolaus Copernicus for Frombork to remember].