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ON THE TRANSMISSION OF COPERNICUS'S *COMMENTARIOLUS* IN THE SIXTEENTH CENTURY

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The earliest formulation of the Copernican heliocentric theory, known as the *Commentariolus*, remained unpublished till the nineteenth century. Handwritten copies must have been distributed very sparingly by Copernicus himself. The earliest and only testimony to its existence from Copernicus's lifetime is the well-known annotation in the 1514 book inventory of the Cracow scholar Matthew of Miechow: "Item: A manuscript of six leaves of a theory asserting that the Earth moves while the Sun stands still."[1] Most likely the treatise reached Matthew of Miechow through Bernard Wapowski, Copernicus's closest friend and colleague in Cracow at that time.

Later in the sixteenth century, with the growing interest in all matters Copernican, a number of copies of the *Commentariolus* began circulating within the invisible college of astronomers. The three preserved copies of *Commentariolus* are apparently from this period, and all of them seem to stem from a copy once owned by Tycho Brahe.[2] The Vienna (Oesterreichische Staatsbibliothek) copy belonged in 1600 to Longomontanus; Duncan Liddel's exemplar, now in Aberdeen, was copied by him in 1585 in Rostock;[3] the copy at the Swedish Academy of Sciences in Stockholm resembles the copy used by Liddel for his transcription, though its date and early ownership are obscure.

We know that Tycho received the *Commentariolus* in Regensburg from "Thaddeus Hagecius" (Tadeaš Hajek), the meeting taking place probably in 1575, and that Tycho distributed it later among several ("quibusdam") astronomers in Germany.[4] There is now further evidence that conjecturally links the Hajek copy to Rheticus, not as a direct inheritance, but through the intermediary of Paul Wittich, a heretofore little-known astronomer whose movements are only now coming to light through the use of archival sources in Central European libraries.

Some important new evidence has been obtained from the huge collection of the correspondence of the Hungarian scholar Andreas Dudith (1533–89).[5] As Dudith is not well known in the realm of the history of exact sciences, a brief account of his career might be of interest.

A cosmopolitan humanist and diplomat, connected with the Habsburg imperial court, he received a careful education at the universities in Padua and Paris, enabling him to join the European intellectual élite of his times. Upon his return to Hungary in 1560, his swift career began both in the Church – he was ordained as bishop in 1561 – and at the court. He represented the Hungarian clergy at the Council of Trent. Sent on a diplomatic mission to Poland, Dudith

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concluded it in a surprising way in 1567 by leaving the Roman Catholic Church, laying down his office, and marrying a Polish noblewoman.

Dudith's services to the emperor were thereafter limited to the duties of an agent of secondary importance. His attention turned to theology, in which he associated with the radical "Minor Church" of the anti-trinitarians, and to science, especially to astrology and astronomy.[6] In the late 'sixties Dudith became acquainted with the well-known pupil of Copernicus, Georg Joachim Rheticus. Through him, Dudith came close to the wider circle of German mathematicians and astronomers. Eager to advance his scientific studies, he invited a young astronomer from Wittenberg, Joachim Praetorius, to Cracow. Praetorius stayed in Dudith's home for almost two years (1569–71), becoming his close friend and teacher. Thanks to this, Dudith received some elementary training in mathematical sciences, although not to the extent of, say, grasping more complex questions, and so he remained a more-or-less well-informed dilettante.

After this initiation into science, Dudith became involved in political activities, with the consequence that he was forced to leave Poland. He eventually settled in Wroclaw, where he lived from autumn 1577 till his death in February 1589. In Wroclaw Dudith again took up astronomical studies, to a large degree thanks to the inspiration of his new-found friendship with the young Wittich, whom he met first in the autumn of 1579, and whom he later called "Witticho-Copernicus noster Regius" and "Neo-Copernicus". These studies were most intensive in the first half of 1581, when the Oxford mathematician and astronomer Henry Savile arrived in Wroclaw, where he stayed at Dudith's house. When Savile left for Vienna that June, the links with Wittich were also weakened. Yet Dudith returned to his favourite science immediately on the arrival in June 1588 of Thomas Savile, the younger brother of Henry. Dudith also renewed his contacts with Praetorius as well as with the Prague astronomer Hajek.

The importance of Dudith's correspondence for the history of exact sciences in general is clear. It contains a significant number of notes pertaining to lesser or less familiar personalities, testifying to long forgotten polemics and illuminating the scientific European milieu of the times. Of special interest here is Dudith's correspondence with Praetorius, preserved in the cathedral library at Esztergom in Hungary and almost unknown to modern scholars. We now extract the fragments referring to the *Commentariolus*, which are eventually to be published in the eighth volume of Dudith's correspondence. The first such entry can be found in the letter from Dudith to Praetorius dated 1 January 1589: "I have the *Epitome of Copernicus* written by the author himself; I don't know whether you have seen it."[7]

Praetorius must have demanded more details, as shown by another letter from Dudith of 12 February 1589:

> Wittich said that the *Epitome of Copernicus* was written by the author himself; he received it from his uncle, a well-known physician and mathematician of this city, Master Balthasar [Sartorius] whose many letters to Rheticus you were able to see at Rheticus's house. I am surprised

> that Rheticus did not show us this *Epitome*, which the doctor [Balthasar] is likely to have received from him; the book was never printed; written in Wittich's hand, it is in quarto; it has 14 folios whose gatherings, as they call them, make four.[8]

It can be surmised that the Doctor Balthasar invoked in Dudith's letter is identical with the Balthasar Sartorius Vratislaviensis, whose career is known only fragmentarily.[9]

Both letters refer to the work as an "epitome" of Copernicus; indeed, Copernicus's little commentary bears something of the same relation to *De revolutionibus* as Peurbach's *Theoricae novae planetarum* bears to Ptolemy's *Almagest*, and it must have been seen as a handy compendium of the basic Copernican ideas. None of the sixteenth-century owners remarks further about it to indicate, for example, that he recognized that Copernicus had reordered the circles between the writing of the two works. It is interesting to realize that all the surviving copies come from after the publication of *De revolutionibus* in 1543, and that if a copy had not propagated through the Tychonic route, the work might remain unknown to this day.

Our quotations reveal a straighforward, continuous line of transmission of the Copernican text: Copernicus – Rheticus – Sartorius – Wittich – Dudith – Praetorius. But this transmission does not account for the three extant copies. Hence it is tempting to consider the possibility of another route: Copernicus – Rheticus – Sartorius – Wittich – Hajek – Tycho Brahe. Wittich's varied scientific relationships with Hajek are known.[10] Further investigation of the correspondence of a wider circle of scientists from their time might solve the question in a not-too-distant future.

The Dudith correspondence shows the appeal of the *Commentariolus* in the latter half of the sixteenth century, not only to the astronomers who were eagerly looking for new ideas, but also to the learned world of the humanists, also eager to read and to broadcast scientific texts. The succinct form of the *Commentariolus* offered them a relatively simple *entrée* into Copernicus's astronomy, and its preservation allows us an insight into the evolution of Copernicus's ideas.

Acknowledgements

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REFERENCES

1. "Item sexternus Theorice asserentis terram moveri, Solem vero quiescere." Cf. L. A. Birkenmajer, *Stromata Copernicana* (Cracow, 1924), 201; M. Biskup, *Regesta Copernicana* (*Studia Copernicana*, viii; Wroclaw, 1973), no. 91.
2. Cf. E. Rosen, *Nicolaus Copernicus Minor works* (Warsaw, 1985), 75–80.
3. J. Dobrzycki, "The Aberdeen copy of the *Commentariolus*", *Journal for the history of astronomy*, iv (1973), 123–7.
4. *Astronomiae instauratae progymnasmata* (Prague, 1603), 479–80, in *Tychonis Brahe Dani Opera omnia*, ed. by J. L. E. Dreyer (Copenhagen, 1913–29), ii, 428. Tadeaš Hajek's uncle, Simon

Hajek, might have been instrumental in transmitting another treatise by Copernicus, the *Letter against Werner*, around 1530.

5. Cf. Pierre Costil, *André Dudith humaniste hongrois* (Paris, 1935). *The correspondence of A. Dudith*, comprising eight volumes, ed. by L. Szczucki and T. Szepessy, is being published by the Publishing House of the Hungarian Academy of Sciences (Akadémiai Kiadó). Vol. i covering the period 1554–67 is in press and will be released in 1990, and vol. ii (for the years 1568–72) is to be published in 1992.
6. Cf. L. Szczucki, "Gli interessi matematico-astronomici di Andrea Dudith", *Rinascimento* (Florence) (in press).
7. Esztergom, Főszékesegyházi Könyvtár (Archiepiscopal Library), Cat. V. Tit. 4d, p. 82: "Habeo epitomen Copernici ab ipso auctore inscriptam; nescio an eam videris."
8. *Ibid.*, p. 97: "Epitomen Copernici ab ipso auctore scriptam fuisse dicebat Wittichius, acceperat eam ab avunculo suo, medico et mathematico huius urbis [Wroclaw] eximio, D. Balthasare, cuius non paucas ad Rheticum epistolas videre apud ipsum Rheticum potuisti. Illud miror Rheticum non ostendisse nobis hanc epitomen, quam verisimile est hunc doctorem ab illo accepisse; non est unquam impressus liber, manu Wittichii scriptus, est in 4°, habet folia 14 qualia unus arcus ut vocant conficit 4. Descriptum tibi mittam... ."
9. Although the family name in the Dudith letter is wanting, there is no other Balthasar except Sartorius to fit the picture. See also L. A. Birkenmajer, *Mikolaj Kopernik* (Cracow, 1900), 600–1, with excerpts from two letters by Sartorius to Joachim Camerarius the elder (6 December 1555) and to K. Peucer (20 April 1556), testifying to his acquaintance with Rheticus and to his active interest in astronomy. The letter to J. Camerarius is signed "Baldasar Sartorius Vratislaviensis". It is noteworthy that Paul Wittich, who stayed with Tycho in the summer and autumn of 1580, had left, as Tycho wrote to B. Scultetus on 12 October 1581: "sub pretextu, quod avunculus eius mortuus esset, haereditatem sibi deberi professus, hinc domum reversus est..." (*Tychonis Brahe Opera*, ed. by Dreyer, vii, 62).
10. Cf., e.g., Owen Gingerich and Robert S. Westman, "The Wittich connection: Priority and conflict in late-sixteenth-century cosmology", *Transactions of the American Philosophical Society*, lxxviii (1988), no. 7.