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Alchemy and the Jesuits: communication patterns between Hungary and Rome in the international intellectual community of the 17th century

Dedicated to Bálint Keserű

The seventeenth century has been justly considered as a turning point in the history of the *respublica litteraria*. The modes of communications between scholars, scientific workshops and courts became faster and more intensive than ever before. Many of the connections that were previously based on the humanist idea of personal friendship turned into institutional relationships within the framework of academies and scientific teams working in royal or princely courts. Furthermore, the means of communication changed substantially: the occasional publication of letter exchanges was slowly replaced by institutional public fora as scientific journals or series of publications. Thus science became a fundamentally public institution, in which aiming at reaching a wider public, possibly by publishing results of research, became pivotal.

All these changes decisively influenced the scientific visibility of European intellectual centres in different ways according to the place they could play in the chain of supplying and distributing novel scholarly information. While countries and cities with a large public presence and international outreach, such as Amsterdam, Paris, or London, became more important centres of communication than ever before, those lands of Europe where the institutional framework of science did not have a solid foundation fared far worse in the seventeenth century than in the era of primarily personal connections, in the fifteenth and sixteenth century. Hungary could serve as a good example for the latter case. While it could boast of widely appreciated humanists like Janus Pannonius (1434–1472) or Johannes Sambucus (1531–1584) in the previous centuries, who held celebrated friendships with most representative figures of the contemporary *respublica litteraria*, there is not a single scholar from the seventeenth century whose name we would surely find in every encyclopaedia or scholarly bibliography of the age. Undoubtedly, the country lacked a central node on the local level within the international network of the *respublica litteraria*, for which the local Jesuit University of Tyrnau (Nagyszombat, Trnava, founded in 1636) and the Protestant colleges of Debrecen, Gyulafehérvár (Alba Iulia) and Kolozsvár (Cluj) could only partially compensate. In the age of courtly science, there was no stable court in Hungary where science could have been discussed and where scholarly discourse could have been formed.

Despite Hungary's obvious deficiencies there remained several modes of scientific knowledge exchange with the Western world in seventeenth-century Hungary. Europe's scientific information centres approached scientific material that came from Hungary in at least four different ways. First, information could circulate about specific scientific products of the country even without first-hand knowledge of the persons, events and phenomena involved. A characteristic example of this approach is the European fame of Nicholas Melchior, an early sixteenth-century alchemist of Szeben (Sibiu, Hermannstadt, Cibinium), to whom an alchemical mass was attributed.[1] In fact, he seems to have remained completely unknown within Hungary, his country of origin, and his international fame was created only in the second half of the sixteenth century in the Czech Lands, probably in the court of Emperor Rudolf II. Subsequently, his work was included in Lazarus Zetzner's *Theatrum chemicum* (1602), an influential anthology of alchemical literature, and he became the representative of Hungarian alchemy under the name of "Melchior Cibinensis Ungarus" in the *Symbola aureae mensae duodecim nationum* (1617) of Michael Maier, a court counsellor of Rudolf II.[2] In fact, Maier's characterization of Melchior Cibinensis, whom he mentions as being on par with Albert the Great, Thomas Aquinas, Arnald de Villanova, Raymundus Lullus and Roger Bacon, rests only on the little factual information he could gather from Zetzner's anthology. For everything else, he had to rely on his own imagination.[3]

Second, scholars with a specific interest in the physical or historical features of the land could call upon local sources to furnish them with the necessary information. In 1666, the Royal Society appointed a Transylvanian student, then studying in England, to collect answers to an enquiry mostly dealing with the quality of local gold, quicksilver, vitriol and other ores.[4] Protestant émigrés from Hungary often maintained close contact with their friends even after their departure, and helped them to publish their reports on unusual natural phenomena: a good example is Daniel Wilhelm Moller, born in Pressburg, who later became a professor in Altdorf, but still published accounts of the natural disasters in his home country based on the letters of his friends there.[5] Jesuits were particularly successful at organizing

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[1] See F. G. Kiss, B. Láng, and C. Popa-Gorjanu, "The Alchemical Mass of Nicholaus Melchior Cibinensis: Text, Identity and Speculations," *Ambix* 53 (2006), 143–59.

[2] Michael Maier, *Symbola aureae mensae duodecim nationum* (Frankfurt: Antonius Hummius, 1617), 507–52. On the structure and importance of this work, see H. Tilton, *The Quest for the Phoenix: Spiritual Alchemy and Rosicrucianism in the Work of Count Michael Maier (1569–1622)* (Berlin 2003), 139–47.

[3] Maier, *Symbola aureae mensae*, 522.

[4] See the study of George Gömöri in this volume.

[5] See Daniel Guilielmus Moller, *Meditatio de insectis quibusdam Hungaricis prodigiosis, anno proxime praeterito, ex aere una cum nive in agros delapsis, ad amicum* ([Francofurti ad Moenum]: Daniel Fievet, 1673), 20–2. Once he quotes a letter written from Neusohl (Banska Bystrica, Besztercebánya, SK) to a friend of his in Pressburg, which was later forwarded to Nuremberg and published there. While writing his work, he received

such information networks in the seventeenth century, and the most prominent scientists of the order often relied on the aid of common members of the Society of Jesus to obtain the desired information. Athanasius Kircher turned to this network several times during the preparatory work for his books, be it on solar eclipses or Chinese monuments of Christianity.[6] As we will see, it was the most important mode of scientific communication with and about Hungary during the seventeenth century.

Third, when queries found no satisfactory answer, travellers, legates or other kinds of emissaries personally had to collect the desired information, publishing or circulating their accounts later when they returned to their home country. Jacobus Bongarsius (Jacques Bongars, 1554–1612)[7] travelled extensively in Hungary and Transylvania, and maintained an information network for French interests in the Habsburg lands through intermediaries, as did Denis Godefroy after him.[8] Bongarsius wrote a travel account of his journey,[9] and showed his unrelenting interest in the region by publishing the first ever collective historical anthology about Hungary, which he intended to present to his contemporaries as an exemplary history of the decay of a great kingdom.[10] Similarly, Jacobus Tollius, the Dutch classicist and alchemist, collected material for his alchemical research personally,[11] and his primary source of information on the quality of ores in Hungary was his own experience.[12]

Fourth, local scholars and scientists could contact the Western centres of information with their publications, as well. Seemingly, this would be the most elementary strategy of reaching the international *respublica litteraria*. However, surprisingly few Hungarian authors, while still residing in Hungary, would publish their scholarly work abroad at international

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another letter from his friends describing the colour of the insects, and asked for further drawings and descriptions from Hungary (106–20).

[6] Kircher collected information on the 1645 solar eclipse from several sources around Europe—even Juan Caramuel Lobkowitz, the celebrated Carmelite theologian, wrote an account for him. See Archivio del Pontificia Università Gregoriana (APUG), ms. 557, 26bisr-34r. On the role of epistolary exchanges in collecting scientific information, see L. Giard and A. Romano, "L'usage jésuite de la correspondance, Sa mise en pratique par le mathématicien Cristoph Clavius (1570–1611)," in *Rome et la science moderne: Entre Renaissance et Lumières*, ed. by A. Romano (Rome 2008), 65–119. For a case study on Kircher's network of information on India, see L. M. Carolino, "Lux ex Occidente. Un régard européen sur l'Inde au XVIIe siècle. Athanase Kircher et les récits des missionairs jésuites sur la science et la religion indienne," *Archives internationales d'Histoire des Sciences* 52 (2002), 102–21.

[7] R. Kohlndorfer-Fries, *Diplomatie und Gelehrtenrepublik: die Kontakte des französischen Gesandten Jacques Bongars (1554 - 1612)* (Tübingen 2009), 30–3, 96–7.

[8] Ibid., 164–6.

[9] Published by H. Hagen, *Jacobus Bongarsius. Ein Beitrag zur Geschichte der gelehrten Studien des 16.-17. Jahrhunderts* (Bern: Fischer, 1874), 62–72.

[10] See *Rerum Hungaricarum scriptores*, ed. by Jacobus Bongarsius (Frankfurt: Wechel, 1600).

[11] He boasts of his personal experiences during his European travels already in his *Sapientia insaniens sive promissa chemica* (Amsterdam: Jansson-Waesberg, 1689), 6.

[12] His account was published and commented upon after his death by his colleague Henry Christian de Hennin: Jacobus Tollius, *Epistolae itinerariae* (Amsterdam: Franciscus Halma, 1700).

fora. Indeed, this probably became a routine practice only at the end of the seventeenth century, with the appearance of Central European scientific journals, such as the *Miscellanea curiosa* (*Ephemerides Medico-physicae*) of the Academia Naturae Curiosorum,[13] or the *Acta Eruditorum* of Leipzig (founded in 1682).[14] A number of doctors and apothecaries from Upper Hungary started to publish their short contributions in these journals from the 1680s.[15] Furthermore, some Hungarian publications received critical applause in the latter journal from 1686 onwards.[16] However, it seems significant that none of the reviewed publications by Hungarian authors (e.g. by George Sylvanus [Szilágyi], Ferenc Otrokocsi Foris and Samuel Szathmárnémethi) were published within the actual territory of the Kingdom of Hungary. Szilágyi published his works in England, while Otrokocsi Foris and Szathmárnémethi published in Franeker in the Netherlands: it seems that reaching an international public with an independent work printed in the Kingdom of Hungary was still impossible at the end of the seventeenth century.

The Kircher connection

In the following, we will examine the history of a particular scholarly contact between Hungary and Rome, in which the collection of source material from a distance (our second type of connection) evolved into a mutual exchange of ideas, a form of scientific discourse which clearly seems to be rare in seventeenth-century Hungary. The main participants were Athanasius Kircher, perhaps the most famous Jesuit scholar around the middle of the seventeenth century, and the Jesuits residing in the colleges of Hungary, while the debate itself was concentrated on the question of the possibility of alchemical transmutation and the value of Paracelsian science. Throughout the process of information exchange, various modes of communication and several media were employed to transfer the desired message to the addressees and to the wider public. The indulgence of the Jesuit order towards scholarly conflicts may explain how debates as the one between Athanasius Kircher and Georg

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[13] See e.g. *Miscellanea curiosa, sive Ephemeridum Medico-physicarum Germanicarum Academiae naturae curiosorum* annus octavus, anni M. DC. LXXVII ([Vratislaviae et Bregae]: Johannes Christophorus Jacobus, 1678), 92–107, which includes observations by Karl Rayger, the physician of Pressburg, who sent them to the editors of the *Ephemerides* in a single letter.

[14] On the first period of the *Acta Eruditorum*, see H. Laeven, *The "Acta Eruditorum" under the Editorship of Otto Mencke* (Amsterdam 1990).

[15] E.g. Samuel Spielenberg and his son David from Leutschau (Levoča, Lőcse, SK), who both published a number of articles in the *Ephemerides medico-physicae* in the seventeenth century. About them, see K. Kapronczay, "Orvosdinasztiák 3. (A Spielenberg-család)" [Medical dynasties (The Spielenberg family)], *Turul* 71, nos. 1–2 (1998), 1–9; and G. A. Spielenberg-Diószegi, "Spillenberg Dávid (1627–1684) lőcsei orvosdoktor és bíró élete" [The life of D. S., doctor and judge of Leutschau], *Turul* 71, nos. 3–4 (1998), 68–74.

[16] See G. Gömöri, "Recenziók magyar szerzőkről az Acta Eruditorum korai évfolyamaiban [Reviews on Hungarian authors in the first years of the *Acta Eruditorum*]," *Magyar Könyvszemle* 118 (2002), 288–92.

Schaidenperger, a doctor at the Jesuit College of Tyrnau, could be created, and how it escalated into a series of Viennese attacks against the *Mundus subterraneus* (1665), the opus magnum of Kircher in the domain of physics. The lessons that we can learn from this case will reveal as much about the functioning of decentralised scholarly networks as the messages such networks are prone to transmit.

Kircher was a well-connected author in the Habsburg court. The Habsburg imperial family was always a major patron of Kircher's work from the time of the rule of Ferdinand III, and many works of his were dedicated either to the emperor or to members of his family. The *Magnes* had been dedicated to Ferdinand III in 1641, and the Emperor was implicitly compared to no less than Hermes Trismegistus himself when Kircher added the adjective "thrice great" (*treismegistus*) to his titles; and in the 1640s and 50s the imperial family was probably the most important patron of his major works.[17] Kircher's relationship to the most powerful Catholic monarchs of Germany was always of pivotal importance, confessing that "Germany was his mother, the Society of Jesus his foster mother."[18] Not only Kircher himself, but also his patron, Emperor Ferdinand III, considered that his scientific work belongs equally to the Jesuit order and to the German nation itself. The emperor's commendatory letter to the *Obeliscus Pamphilus* (1650, dedicated to Pope Innocent X) proclaimed, "it is not only of public interest that you finish the research which you started, but it also collects praise and extolment for the German Nation."[19] This double, patriotic and confessional, allegiance meant at the same time that he always had to take into consideration the opinion of the imperial court about his works, and accept its directives even concerning minor details.

The Jesuit confessors to the Emperor acted as intermediaries in this relationship, and the letters of Johannes Gans, confessor to Ferdinand III,[20] and Johann Schega, confessor to Leopold I, reveal an intense exchange of ideas and a continuous flow of ecclesiastical-diplomatic information, while talking with an unusual openness about political incentives, innuendos and the financial aspects of Kircher's publications. After a series of publications in

[17] They received the dedications of the *Lingua aegyptiaca restituta* (1643, to Ferdinand III), the *Ars magna lucis et umbrae* (1646, to Archduke Ferdinand, the son of Ferdinand III), the *Musurgia universalis* (1650, to Archduke Leopold William), the *Oedipus Aegyptiacus* (1652, to Ferdinand III), the *Polygraphia nova* (1663, with a congratulatory letter of Archduke Leopold William), the *Ars magna sciendi* (1669, to Leopold I), the *Phonurgia nova* (1673, to Leopold I), the *Arca Noë* (1675, to Charles II, king of Spain), and of the *Turris Babel* (1679, to Leopold I).

[18] Athanasius Kircher, *Magnes, sive de arte magnetica* (Rome: Grignani, 1641), a3v.

[19] Letter of Ferdinand III to Kircher, dated Regensburg, 3 Oct. 1640, published in *Obeliscus Pamphilius, hoc est interpretatio nova et hucusque intentata Obelisci Hieroglyphici* (Rome: Grignani, 1650), b1r.

[20] About him see Robert Bireley, SJ, *The Jesuits and the Thiry Years' War: Kings, Courts and Confessors* (Cambridge 2003), 209–11, and passim.

the 1640s, which showed his close attachment to the imperial court, Kircher again wanted to dedicate his *Musurgia universalis* (1650) to the emperor, but Gans had to inform him that the offer was turned down, writing that "not every work has to be dedicated to one and only one person."[21] Kircher still seems to have been keen on dedicating his works to the highest secular authority of Europe, and when he had finished his monumental three-volume *Oedipus Aegyptiacus* (1652–1655), a symbolic interpretation of the Egyptian hieroglyphs in the terms of Mosaic wisdom, he wrote again to the emperor asking for clarifications concerning the dedication (namely, the person of the dedicatee or dedicatees, and a proper theme for the engraving of the title page).[22] Gans replied to this enquiry from Pressburg on 22 March 1655: "Your letter is being read by the Emperor at present, and he asks that you should send a copy of your work by his servants, courier or anybody else. Concerning the dedicatees, his decree is that they should be cardinals, electors, and other outstanding dukes of the Empire, and you should send over their names. When will we have a Pope finally? We quickly finished with creating a palatine, and thank God, it was well done."[23] Later in May, the Jesuit Iodocus Kedd gave Kircher more detailed suggestions for the dedications, referring to Gans as the source of information, and defining the structure of multiple layers of dedications that Kircher should follow: the dedicatees of the three main parts (Ferdinand III, the future Ferdinand IV, and Christina, Queen of Sweden) were decided by Gans,[24] but Kircher was probably free in selecting his patrons for the subchapters, who were finally ordered in a more or less hierarchical manner, starting with cardinals, electors and archbishops and finishing with literary figures from contemporary Rome at the end of the third volume (Lucas Holsten and Leo Allatius).

The connections of Kircher to Hungarian prelates and aristocrats started to evolve within the context of this organised network of dedications at the time of the publication of *Oedipus*. Archbishop George Lippay (1600–66) had already been selected for a dedication before Gans' letter, as the Jesuit father Martin Palkovich (1606–62, then Chancellor of the

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[21] APUG ms. 561, 136r. For accessing the Kircher archives of the Gregorian University in Rome, I have been using the Kircher database at Stanford University (http://www.stanford.edu/group/kircher/), along with the index of the collection: W. Gramatowski, SJ, and M. Rebernik, *Epistolae Kircherianae* (Rome: Institutum Historicum Societatis Iesu, 2001).

[22] Previously Kircher tried to dedicate the work to the Polish king Wladyslas IV, but his offer was refused. See Targosz, "Polscy korespondanci Atanazego Kirchera" [Polish correspondents of Athanasius Kircher], *Studia i materialy z Dziejów Nauki Polskiej, Historia Nauk Spolecznych* 12 (1968), 123–4. On the Jesuit strategies of dedication, see M. Baldwin, "Pious Ambition: Natural Philosophy and the Jesuit Quest for the Patronage of Printed Books in the Seventeenth Century," in *Jesuit Science and the Republic of Letters*, ed. by M. Feingold (Cambridge, MA 2003), 285–339, on Kircher p. 293 and 308–15.

[23] APUG, ms. 561, f. 119r.

[24] APUG, ms. 561, 212r.

University of Tyrnau) wrote to Kircher already on 19 May 1654, that "your reverend father knew very well in his letter sent to me, that our Archbishop is greatly attracted to the Republic of Letters, and he loves especially your works, as he spends many hours in reading them."[25] Kircher's chapter in the second part of the second book of *Oedipus* about ancient Egyptian engineering was remunerated by the archbishop with 200 imperial ducats, for which Kircher sent a letter of receipt, wishing for many more generous patrons for the republic of letters like Lippay.[26] In exchange, Lippay received an illustrious place in the work, just between a dedication to the emperor (to whom several subchapters are dedicated, too) and John Philip, elector of Mainz, and just before Friedrich, count of Hessen, Ferdinand II, grand duke of Tuscany, and Cardinal Fabio Chigi. The presentation copy of *Oedipus* dedicated by Kircher to Lippay was later donatedto the Hungarian magnate Nicholas Zrínyi by the archbishop, and Lippay might have chosen the title of his speculative alchemical work later dedicated to Emperor Leopold I (*Mons Magnesiae*) probably on the influence of Kircher's magnetic treatises.[27] The other Hungarian dedicatee of *Oedipus*, the young Count Ferenc Nádasdy (1625–1671), a recent convert to Catholicism, received a much less outstanding place at the end of the third volume; however, later on, he would receive an independent dedication in Kircher's *Arithmologia* (1665).[28]

At the end of his letter to Lippay, Kircher announced his preparations for his following two works, *Itinerarium extaticum* and *Mundus subterraneus* (Subterranean world), and especially asked for help from the archbishop for the second partly mineralogical work: "I devote all my time to the work entitled *Mundus subterraneus*, and if your Highness could enrich it with anything from the abundant natural treasures of Hungary, I promise that I will

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[25] APUG, ms. 567, 117r.

[26] Esztergom, Archives of the Metropolitan See, Archivum Saeculare, Acta Radicalia, Classis X, No. 196. 28. cs., f. 342. (dated 1 Dec. 1656). The letter was published in my "Difficiles nugae: Athanasius Kircher magyar kapcsolatai (Nádasdy Ferenc és a jezsuiták)" [The Hungarian contact of Athanasius Kircher (Ferenc Nádasdy and the Jesuits)], *Irodalomtörténeti Közlemények* 109 (2005), 436–68. There is indirect proof of their earlier relationship in a letter exchange between the archbishop and his personal doctor and scientific advisor, Polycarpus Procopius Bonanus, who wrote to him on 8 Oct. 1650, that a recently built fountain in the garden of the archbishop does not function well, and "Kircher did not write anything useful." *Epistolae ad Procopium Polycarpum Bonanum, 1648-1662*. Esztergom, Főszékesegyházi Könyvtár, Ms. I. 172. letter 4.

[27] Österreichische Nationalbibliothek, cod. 11280. Cf. R. J. W. Evans, *The Making of the Habsburg Monarchy, 1550–1700: An Interpretation* (Oxford: Clarendon Press, 1979), 379; and Kiss, "Difficiles nugae."

[28] This was a Lullist work on the symbolism of numbers, which evolved from a chapter of the *Oedipus Aegyptiacus* (vol. II/2, first part of classis VII). The self-repetitive nature of Kircher's works was often criticised by his Jesuit censors: D. Stolzenberg, "Oedipus Censored: Censurae of Athanasius Kircher's Works in the Archivium Romanum Societatis Iesu," *Archivum Historicum Societatis Iesu* 73, no. 145 (2003), 19; H. Siebert, "Kircher and His Critics: Censorial Practice and Pragmatic Disregard in the Society of Jesus," in *Athanasius Kircher: The Last Man…*, 79–104; and H. Siebert, *Die grosse kosmologische Kontroverse. Rekonstruktionsversuche anhand des Itinerarium exstaticum von Athanasius Kircher SJ (1602-1680)* (Stuttgart 2006).

edit it under your glorious name."[29] Kircher might have known that Lippay was exploring the mining regions of Upper Hungary for precious stones with the aid of his doctor, Procopius Bonanus,[30] who intended to publish an illustrated volume about Hungarian minerals.[31] But Kircher advertised his forthcoming work in other fora, as well: he published its table of contents, and a call to possible contributors in the second volume of *Itinerarium extaticum*,[32] and circulated questionnaires within the order with the purpose of receiving information on local mineralogical and scientific curiosities. He received a thorough response from Johann Eissert SJ in Upper Austria,[33] and it was Eissert who informed Andreas Schaffer, a German Jesuit residing in the mountainous regions of Upper Hungary, about Kircher's intentions. Schaffer gave a detailed account of the minerals that could be found in the vicinity of the Jesuit college, its mining practices, the dividing methods used when processing the ores, the subterranean lakes and waters, any living creatures that could be found there and last but not least the existence of dwarves in caves and mines.[34]

Schaffer's exchange of letters caused excitement in the Jesuit colleges of Upper Hungary, and local church prelates even tried to invite Kircher to Hungary to observe and study these phenomena first-hand. According to Schaffer's vivid account of the events, when he showed Archbishop George Lippay and Archbishop George Szelepcsényi his collection of precious stones that he was about to send to the Roman scholar, the two church prelates were really happy to help his efforts:

> I cannot explain with words how glad these princes were, that your reverend father is striving so hard for the honour of Hungary. Both of them, and other noblemen, helped me in arranging these things for you.

[29] Esztergom, Archives of the Metropolitan See, Archivum Saeculare, Acta Radicalia, Classis X, No. 196. fasc. 28., f. 342. (Cf. note 25).

[30] See J. Ernyey, "Természettudományi mozgalmaink a 17–18. században" [Natural history in Hungary in the 17th–18th century], *Pótfüzetek a Természettudományi Közlönyhöz* 44, supp. 107–8 (1912), 112–29. Despite his Italian name, Procopius Polycarpus Bonanus was a medical doctor born in Vienna, who graduated in Padua in 1653. Cf. *Matricula nationis Germanicae artistarum in Gymnasio Patavino (1553-1721)*, ed. by L. Rossetti (Padua 1986), 292, n. 2593; and *Acta nationis Germanicae artistarum (1637-1662)*, ed. by L. Rossetti and A. Gamba (Padua 1995), 419.

[31] Bonanus' book project—allegedly enriched with 200 engravings—unfortunately failed because of his sudden death, and the lack of properly equipped local printers. The letters 27, 32, and 92 in his letter collection show his efforts at having his book printed—in vain. Cf. *Epistolae ad Procopium Polycarpum Bonanum*, 1648–1662, in Esztergom, Metropolitan Library of the Archbishopric, Ms. I. 172.

[32] Athanasius Kircher, *Iter extaticum II, qui et Mundi Subterranei Prodromus dicitur* (Rome: Mascardi, 1657), Praefatio ad Lectorem (not numbered) and 228–37.

[33] Starting with his letter from 29 July 1659 (APUG, ms. 561, 290r). For the list of his letters, see Gramatowski-Rebernik, *Epistolae…*, 40 (all sent from Traunkirchen).

[34] Some letters of Schaffer survive in the archives of the Pontifical University Gregoriana (see the list in Gramatowski-Rebernik, *Epistolae…*, 98), while his detailed responses and other letters have been published in the *Mundus subterraneus* vol. 2, 182–190. Kircher received a detailed answer concerning mining dwarves from Hans Schaplmann (APUG 565, 101r-107r), which he included in his chapter on subterranean demons (ibid., 102–3).

> I would consider it most appropriate if your reverend father wrote something to the archbishop, so that they would search through their territories (where there are subterranean fields of the noblest and rarest kind) by their own men, or by other people from the Royal Chamber (where one can find knowledgeable persons about this subject). I honestly hope that both of them will offer generous help with money (as they are really rich!).[35]

Similarly, patriotic and confessional allegiances overlap in another letter of Schaffer, where he presents the miraculous natural resources of Hungary as a counterpoise to the Turkish tyranny and the numerous Protestant sects that devastate the country.[36] Scientific interest, Catholic self-awareness and patriotic pride created a welcoming atmosphere for Kircher's works around the Jesuit University of Tyrnau in Upper Hungary. A number of anonymous publications (a series of calendars, a treatise about physiognomy and a prognosis about the comet of 1661) printed at the university have survived from the years 1658–69, all of which name a certain "Astrophilus" as the author. Documentary evidence (taken from the Jesuit *Litterae annuae* of the Austrian province and the correspondence of Athanasius Kircher) shows that Astrophilus must have been Johann Misch, a Jesuit from Luxembourg teaching at the University of Tyrnau.[37] In his *Speculum physiognomicum*, an abbreviated version of the *Physiognomia humana* of the French Jesuit Honorius Nicquetius, Misch presented Kircher's physiognomy as the example of "tall forehead," which he interpreted as a sign of strong imagination, and he figured Kircher in a list among other excellent mathematicians of the society, who all had a long forehead.[38] Misch, an avid reader of *Ars magna lucis et umbrae* and *Oedipus Aegyptiacus*, even asked Kircher if the fixation of mercury was possible according to him. Sharing his doubts about his own experiments, he described how he fixated the mercury with the help of a servant, who might have mixed something to his tincture at the only occasion when they succeeded in producing the solid mercury.[39] Openly quoting a number of celebrities of iatrochemistry (Andreas Libavius, Oswald Croll, Daniel Sennert, Jan Baptist van Helmont—many of whom were Protestants), he evidently accepted the possibility of sympathetic cure, and recited even a story of a pharmacist in Pressburg, whose ring, made out of fixated mercury, protected him from

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35 APUG 559, 137r. (dated 25 Apr. 1660).

36 APUG 558, 50r. (dated 1 Apr. 1660).

37 See my "Johann Misch Astrophilus Nagyszombatban" [Johann Misch Astrophilus in Tyrnau], *Magyar Könyvszemle* 121 (2005), 140–66; and I. Kiss, "Johann Misch Astrophilus *Szegények patikája* műve magyarul. Egy elveszett vagy lappangó könyv másolt, teljes kézirata 1660-ból" [Johann Misch Astrophilus' *Medicina Pauperum* in Hungarian. A manuscript copy of a lost printed book from 1660], *Orvosi Hetilap* 152 (July 2011), 1093–7.

38 [Johann Misch], *Speculum physiognomicum* ([Tyrnavia]: typis Universitatis, 1662), 57.

39 APUG, ms. 558, 92r-93v.

contracting pestilence. Evidently Kircher's friends, both in Vienna and the Jesuit colleges of Upper Hungary, supposed that the greatest contemporary Jesuit authority of sciences held alchemy and sympathetic medicine in the same high esteem as the Vienna court[40] and the Jesuit medical practitioners in the Austrian province.

However, Kircher's stance on alchemy was completely different from most of his German contemporaries, and he rather aligned himself with the official Roman point of view, in compliance with the Aristotelian philosophy, which denied the possibility of transmutation and medicine based on sympathetic or antipathetic effects.[41] His critical stance against Paracelsian medicine appeared already in his *Ars magnesia*, where he refuted the idea of a parallel between magnetic power and any distant action mechanisms (*actio distans*), such as that of the weapon salve (*unguentum armarium*, *Waffensalbe*).[42] As Kircher says, if such medical treatments are sometimes effective, it is not a proof of their general efficacy, but an evidence of the user's pact with the devil, and even if Paracelsus and his Rosicrucian followers can save their patient's body, they will surely lose his soul.[43]

The Mundus Subterraneus *and its critiques*

In *Mundus subterraneus*, Kircher clearly wanted to offer his criticism of alchemy directly to the emperor, widely known to have been initiated into Hermetic studies. Kircher dedicated the first volume (mostly dealing with the composition of Earth and the non-living beings) of *Mundus subterraneus* to Pope Alexander VII, while the second volume, concentrating on changes and mutations between the material and animal world, was dedicated to Emperor Leopold I. Both the dedication and the engraving of the title page reveal that the leading inspiration behind Kircher's wisdom was ultimately the emperor himself. In front of a statue of Magna Mater (Nature), Hermes and a poet laureate (probably Orpheus, quoted on the bottom of the page) direct the pen of a wise lady (Pallas or Sophia?), describing the mysteries of the natural world in the form of triangular obelisks, while an angel is showing the portrait of Emperor Leopold I to Hermes and Orpheus.[44]

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[40] See P. H. Smith, *The Business of Alchemy, Science and Culture in the Holy Roman Empire* (Princeton 1994), 14–55.

[41] Cf. M. Baldwin, "Alchemy and the Society of Jesus in the 17th Century: Strange Bedfellows?," *Ambix* 40 (1993), 427–64; and S. Matton, *Philosophie et alchimie à la Renaissance et à l'âge classique. Scolastique et alchimie (XVIe-XVIIe siècles)* (Paris and Milan 2009).

[42] For Kircher's opinion, see *Theatrum sympatheticum auctum, exhibens varios authores de pulvere sympathetico* (Nuremberg: Endter, 1662), 567–73.

[43] Ibid., 572.

[44] Kircher quotes the Orphic hymn on Kronos: *Hymni Orphici* 12, lines 8 and 3. On the title pages of seventeenth-century scientific works in general, see Volker Remmert, *Widmung, Welterklärung und*

Kircher's well-structured and methodical annihilation of the usefulness of alchemy consisted of four main points: First, he showed that its history is much less ancient than believed by most practitioners, and it stretches back only to Roman times. Then, he examined the physical possibility of transmutation, based on the experiments of Paracelsus, and refuted their practical applicability. Third, he listed and morally discredited those alchemists who promised to create gold from less precious metals (*alchymistae sophistici*). And finally, he collected laws against alchemy from canonical law, ecclesiastical legislation and even from some Arabic sources.[45] His arguments were overwhelmingly not based on Aristotelian natural philosophy. Instead, he often used moral arguments against alchemical practitioners, and showed that even supposedly Christian alchemists have breached the limits defined by Christian theology when they claimed that they created living beings out of dead matter. Furthermore, using his expertise in Arabic and ancient languages, he confuted the mythological-historical statements of Paracelsus.[46] In sum, he mostly followed the traditional scholastic arguments against alchemy, emphasizing the covetous, greedy motivation of alchemists, while not forgetting to mention occasionally the irreproducibility of Paracelsian experiments.

Mundus subterraneus immediately raised serious interest in every scholarly community in Europe. One of the first issues of the Philosophical Transactions of the Royal Society published a ten-page review of the most interesting revelations in Kircher's book.[47] Two years later, probably also induced by the rich material covering the mountainous regions and mines of Hungary in *Mundus subterraneus*, the same journal published a list of enquires on the topic.[48] Just three years later, Edward Brown, a traveller and son of the physician Thomas Brown, came up with replies at least to the questions concerning the mining procedures used in Hungary. Thus, the official journal of the Royal Society, founded for the "improvement of natural knowledge," welcomed the publication of the Roman Jesuit, and reacted immediately to control his most interesting statements.

Nevertheless, *Mundus subterraneus* was not welcomed everywhere so smoothly and warmheartedly. Francesco Redi, the Florentine polymath, criticised Kircher's stance on the spontaneous generation of insects in his *Esperienze intorno alla generazione degl'insetti*

Wissenschaftslegitimierung: Titelbilder und ihre Funktionen in der Wissenschaftlichen Revolution (Wiesbaden 2005).

[45] Athanasius Kircher, *Mundus subterraneus*, vol. 2 (Amsterdam: Jansonius, 1665), 231–325.

[46] Ibid., 2:251. The Sibylline enigma, which according to Paracelsus referred to the numeric value of the word *arsenikon*, can be transcribed as "o anthropos theos" (The man [is] god), according to Kircher.

[47] N.N., "Of the Mundus Subterraneus of Athanasius Kircher," *Philosophical Transactions of the Royal Society* 1 (1665), 109–17.

[48] See the detailed analysis in György Gömöri's article in this volume.

(1668).[49] In 1669, Johann Joachim Becher (1635–1682), imperial counsellor and court physician of the Bavarian elector Ferdinand Maria, mentioned Kircher's shortcomings in the introduction to his own Latin *Physica subterranea*, while apologizing for having chosen almost the same title for his work, as Kircher did for his *Mundus subterraneus*:

> It might seem as if I was writing an Iliad after Homer, when I am writing a *Mundus subterraneus* after the reverend father Kircher, that excellent man, and anyone could have a misgiving, that I was borrowing this and that from him. But as it will turn out from the thing itself, this is not so. As I was taking another road, namely that of practice, which the reverend father Kircher necessarily lacked, due to the rules of his order, and it was inevitable that this lack had an influence on him.[50]

Thus, according to Becher, Kircher could not pursue his task properly because he was lacking the practical experience in earth sciences (i.e. minerals and alchemy), and he excuses Kircher from this deficiency with the rules (*conditiones*) of his order, the Jesuits.

Despite the prejudices of Becher, there were many in the Jesuit order, and especially in the Austrian province, who were well trained in alchemy and remained unsatisfied with Kircher's rigid rejection of transmutation. Following the accounts sent to Kircher by the Jesuit astrologer and alchemist Johann Misch, his close friend Dr Georg Schaidenperger, the physician of the College of Tyrnau, addressed several questions to Kircher concerning his criticism of alchemy and the scientific work of Paracelsus, to which Kircher devoted several chapters in his *Mundus subterraneus*.[51] In these letters, which survive in the epistolary of Kircher at the *Università Gregoriana* in Rome, Schaidenperger tried to maintain both the theoretical and the practical possibility of alchemical transmutation and defend Paracelsus from the charges of heresy and misconduct, deeming him the greatest German scholar.

Schaidenperger, the Carinthian-born physician who came to Tyrnau after finishing his studies in Padua, first wrote to Kircher in December 1666. They had known each other for a long time, as Schaidenperger visited Kircher in 1650, and Schaidenperger remembered well this event, but this occasion was not followed by an exchange of letters until the publication

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[49] See H. Hirai, "Kircher's Chymical Interpretation of the Creation and Spontaneous Generation," in *History of Alchemy and Chemistry*, ed. by L. Principe (New York 2007), 77–8.

[50] Johannes Joachimus Becherus, *Actorum Laboratorii Chymici Monacensis, seu Physicae Subterraneae libri duo* (Frankfurt: Zunner, 1669), Dedicatio, B2v-B3r.

[51] Georg Schaidenperger's activity has been little studied before. Cf. R. W. Soukup, *Bergbau, Alchemie und frühe Chemie. Geschichte der frühen chemischen Technologie und Alchemie des ostalpinen Raumes unter Berücksichtigung von Entwicklungen in angrenzenden Zonen*, Chemie in Österreich. Von den Anfängen bis zum Ende des 18. Jahrhunderts, 1 (Cologne 2007), 416; and D. Neumann, "Paracelsus und Kärnten," in *Paracelsus (1493–1541). "Keines andern Knecht…,"* ed. by H. Dopsch, K. Goldammer, and P. F. Kramml (Salzburg 1993), 37.

of *Mundus subterraneus*. He first saw the volume in the possession of Archbishop Georg Lippay, and then he bought his own copy at the Vienna book fair. He read it through and had mixed feelings about it: although it was an immense, almost transcendental work, it left doubts in him on several matters. Still, according to Schaidenperger, Kircher might excuse these doubts, as they come from a genuine German soul ("ex Germano meo pectore"). The question of national pride and the national character of science would be a central issue in this debate.

The first letter of Schaidenperger did not aim higher than simply providing a thoroughgoing critical reading of the work of Kircher with a pragmatic stance. He added to the bibliography of Kircher on several issues, corrected a few minor details, and contrasted his statements with Glauber. But the focus of this ten-page letter lay elsewhere: his three most important aims were to defend the efficiency of antimony, the usefulness of mercury, and Paracelsus himself. For the first two issues, Schaidenperger quoted almost exclusively non-Galenic medical literature, namely John Baptist van Helmont. Although he admitted to knowing the charges of heresy raised against van Helmont, he evaded the ban on his works by stating that Kircher himself quoted van Helmont several times in his *Scrutinium pestis*, a study on the spread of plague in 1659. Furthermore, if Kircher only believed what he had seen with his own eyes, how can he believe in the existence of underground towns? Would not he believe the antipathy of the toad, if he had not seen it with his own eyes? The last question was particularly well informed, as Schaidenperger pointed with it to the fact that Kircher himself admitted in his *Scrutinium pestis* the efficacy of the *xenexton*, van Helmont's preventive medicament against the plague.[52]

Both in his first letter, and in the later ones, Schaidenperger devoted the longest passages to the defence of Paracelsus. He pursued his reasoning against Kircher with a startling naiveté: his sincere trust in Kircher was clearly based on the common German national identity.[53] The main charge against Paracelsus, that he was a simple impostor, repeated over and over again in the anti-Paracelsian literature of the seventeenth century, is quickly dismissed because of the medical efficacy of his inventions. Moreover, Schaidenperger tried to defend Paracelsus from the charges of heresy. Unsurprisingly, he did not quote such instances of Paracelsian thought, like his Trinitarian theology, which equalled sulphur with the Father, salt with the reborn body of Eucharist, and mercury with the Holy

[52] Athanasius Kircher, *Scrutinium physico-medicum contagiosae luis, quae Pestis dicitur* ([Romae]: Mascardi, 1658), 199.
[53] APUG, ms. 562, 158r.

Spirit, which is supposed to work as an agent of mediation (*Opus Paramirum*). Rather, he chose to argue with the strategy of "the enemy of my enemy is my friend." As many Protestants called Paracelsus a magus or a heretic—including Heinrich Bullinger, Thomas Oporinus, Thomas Erastus and Andreas Libavius (whom Kircher himself had placed on the list of impostors)—it is reasonable to suppose that he must have been a good Catholic. As Schaidenperger reconstructs the life of Paracelsus, he had escaped from Basel only because the city turned Protestant, and he never left his Catholic faith. In the following letters, Schaidenperger continued to defend several works of Paracelsus, often resorting to the aid of public opinion, and argued that although Kircher would not accept the functioning of a Paracelsian cure, it seems to be efficient in reality. In other instances, the physician of Tyrnau blamed the resistance of Kircher to Paracelsus on the malignant adversaries of the greatest German philosopher. Schaidenperger confesses that he studied in various Jesuit schools for ten years, still he never heard such a negative opinion about Paracelsus as that of Kircher's.

Surprisingly, Kircher replied to this detailed criticism of his book, but unfortunately his reply did not survive. However, we might reconstruct its content from the second letter of Schaidenperger, written to him on 31 March 1667.[54] Schaidenperger started this letter with an apology: he never would have dared to write unless Kircher encouraged his readers to contribute to his enterprise, if they had any interesting additions to the volume. There is a slight shift here from Schaidenperger's previous letter, where he was still posing as a personal acquaintance, a former visitor, and possibly even a friend. As we might surmise from the self-depreciation of the Tyrnavian doctor, Kircher's letter contained two major points, neither of which might be called a friendly piece of advice: First, Schaidenperger must have unabashedly read texts which were on the Index. Schaidenperger's defence to this point is weak: he read the works of Paracelsus before he came to know they were on the index, as they had been suggested to him by other Jesuits, professors of philosophy and theology, but right after he realised his mistake, he asked for a permission to read them from the apostolic legate of the Church.

The second charge of Kircher against Schaidenperger was probably even more malicious: he claimed that the Hungarian doctor might have read the writings of the Rosicrucians, although Schaidenperger did not hint at the Rosicrucian brotherhood anywhere in his letter. At this point, the medical doctor from Tyrnau slyly confessed that he did not know what to think of the Rosicrucians, as all that he knew about them, he read in Kircher's

[54] APUG, ms. 558, 113r-114v.

book. However, one might suppose that Kircher was in fact very well informed about the popularity of the *Chemical wedding of Christian Rosenkreutz* in the Habsburg Empire, and actually Schaidenperger could have easily known these writings. As we have seen above, the Jesuits of Tyrnau stood in close contact with the archbishop of Esztergom, then residing in Pressburg. A surviving copy of *Basilica chymica* by Oswald Croll, which once belonged to Procopius Bonanus, the physician of Archbishop Georg Lippay, abounds in handwritten Rosicrucian references on the margins.[55] Although we have no direct proof of Lippay's interest in Rosicrucianism, he seems to have been closely associated with both Procopius Bonanus and Schaidenperger in his alchemical experiments. A few years later, when Johann Joachim Becher, the scientific and economic advisor of Leopold I, listed the names of the successful alchemical practitioners, he included archbishop Lippay and Schaidenperger next to each other and among those who have obtained the "tincture" (alchemical Gold).[56]

At one point in his letter, Schaidenperger rather daringly referred to a failed experiment that the archbishop wanted to conduct following the procedures described in *Mundus subterraneus*. In this rather ironic remark, he says that the failure of one single experiment does not mean that the whole experiment and its results are wrong. When archbishop Lippay wanted to recreate the tincture of the corals from *Mundus subterraneus*, he did not succeed in it, although he was helped by some Jesuits.[57] But it does not mean that Kircher's book was wrong, but only that this single experiment failed—and he advises Kircher to apply this lesson to the teachings of Paracelsus. Moreover, Schaidenperger confesses that he knows several Jesuits, who reproduced not only the medical *usnea* (lichen) of the great German doctor, but also his most forbidden xenexton, the powder of the toad, which prevents plague with its antipathetic power as a kind of amulet.[58]

Reactions from Vienna

At first, the gesture of a modest "physicus Tyrnaviensis," a doctor working in a distant college of the Society of Jesus in Tyrnau, might seem to be extraordinarily brave and startling.

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[55] Oswald Croll, *Basilica Chymica continens Philosophicam propria laborum experimentia confirmatam* (Frankfurt: Tampachius, n.d.). Bonanus noted his exlibris on the title page in 1649 ("Ex lib. M. Poly: Bonanni Ao 1649 Comp[aratus]"). Beside the writings of Basilius Valentinus, he quotes in his notes a number of authors dealing with chemical philosophy (Raymundus Lullus, Paracelsus), and the unification of Galenian and Paracelsian medicine.

[56] *Doctor Johann Joachim Bechers Römischer Kays. Mayt. Raths Gutachten über Herren Daniels Marsaly Process zur Tinctur überreicht Ihro Kays. Mayt. zu Layenburg den ii. May. 1674.* Österreichische Nationalbibliothek, Cod. 11472, 53r. The third Hungarian alchemist mentioned by Becher is Pál Esterhazy (53r).

[57] APUG, ms. 562, 163v.

[58] On the seventeenth-century use of xenexton, see M. Baldwin, "Toads and Plague: Amulet Therapy in Seventeenth-century Medicine," *Bulletin of the History of Medicine* 67 (1993), 227–47.

Challenging the main scientific oracle of the Society in Rome could have led to dangerous consequences for the challenger, and as we have already seen, Kircher hinted at the perils of reading books which were on the Index. However, a closer examination of the circumstances of this challenge will show that the surprising braveness of Schaidenperger in defending his position against a Jesuit cardinal might not be due to the virtual equality of the scholars in the republic of letters. Rather, it can be attributed to the dissatisfaction with Kircher's work in the Viennese courtly circles of Leopold I, with which Schaidenperger was in close contact.

Schaidenperger seems to have belonged to a close-knit group of Viennese physicians, many of whom shared the common background of having studied in Padua in the 1640s. He studied at the Faculty of Arts at the University of Padua between November 1645 and 1648, when he became a doctor, receiving a waiver from paying the graduation fees to the German Nation at the university.[59] Among the contemporary Paduan students we find not only Johann Zwelfer (Zwölfer, 1618–68), who later became a professor of the medical faculty in Vienna, but also Otto Tachenius (1610–80), a doctor practicing in Venice and author of *Hippocrates chymicus* (1666), Johann Jakob Wepfer (1620–95), a Swiss pathologist, and Michael Sennert (1615–91), a medical professor of Wittenberg.[60] At the beginning of the 1650s, they were followed by Paul Sorbait (1624–91), a professor of medicine in Vienna and the personal physician of Queen Eleonore, the widow of Emperor Ferdinand III, and Polycarpus Bonanus, the physician and scientific advisor of Archbishop Georg Lippay.[61]

The Viennese group of these Paduan students and other medical doctors seems to have held tightly together. Its members were represented to the public in the first edition of the *Animadversiones in Pharmacopoeiam Augustanam* (Remarks on the Augsburg pharmaceutical rules) of Johann Zwelfer, published in 1652.[62] In this immense work, Zwelfer collected his corrections to the receipts of the Augsburg pharmacists, which was then widely

[59] See *Matricula nationis Germanicae artistarum in Gymnasio Patavino (1553–1721)*, ed. by L. Rossetti (Padua 1986), 271 (n. 2332); and *Acta nationis Germanicae artistarum (1637–1662)*, ed. by L. Rossetti and A. Gamba (Padua 1995), 343, 348.

[60] For references, see *Matricula nationis*, ed. by Rossetti, 265 (n. 2255: Iohann Zwelfer), 268 (n. 2287: Iohannes Iacobus Wepfer), 271 (n. 2326: Otto Tackenius), 273 (n. 2358: Michael Sennertus, filius Danielis).

[61] See *Matricula nationis*, ed. by Rossetti, 289 (n. 2563: Paulus de Sorbait Hannoniensis, Professor praxeos primarius Viennae, imperatricis Eleonorae protomedicus), 292 (n. 2593: Polycarpus Procopius Bonannus Austriacus Viennensis). Paul Sorbait received his doctorate in 1651, Polycarpus Bonannus in 1653. See *Acta nationis*, ed. by Rossetti, 392, 419, 429.

[62] Johann Zwelfer, *Animadversiones In Pharmacopoeiam Augustanam Et Annexam Eius Mantissam, Sive Pharmacopoeia Augustana Reformata, In Qua Vera Et Accuratissima methodo medicamentorum simplicium & compositorum praeparationes tam dextre traduntur, ac insuper Antiquorum errores deteguntur* (n.p.: Sumptibus Authoris, 1652).

used all over Germany, and at the same time harshly criticised some of his contemporaries.[63] Among the epigrams greeting the publication of this monumental volume, we find Johann Jakob Wepfer, Paul Sorbait and Schaidenperger, some of them mentioning explicitly the common Paduan background.[64]

The central figure of the Viennese medical school was undoubtedly Johann Zwelfer, and he took the responsibility of responding to Kircher's criticism against the practice of alchemy, too. The first edition of the *Animadversiones* of Zwelfer (1652) was quickly followed by the updated versions of 1657[65] and 1667,[66] and finally superseded by the one published in 1668, the last edition in Zwelfer's lifetime. The final edition was completely overhauled: the original title page etching of 1652 representing Hermes and Hippocrates was redesigned, and its central image now included six unidentified figures.[67] New elements appeared in the niches surrounding the title image, which represented an alchemical laboratory, a museum, a mine and a zoo. The dedicatee was changed, as well: instead of Emperor Ferdinand III, the book was rededicated to Leopold I, representing the close bond of Zwelfer to the Vienna court.[68] The preface itself became a manifesto in defence of the apothecary physicians (*pharmacus-medicus*): a doctor practising without pharmacy resembles a soldier without weapon and shield. According to Zwelfer, iatrochemical medicine was detested only by those who had never tried it, and he summarised his fundamental ideas in the preface, which are clearly influenced by Helmontian conceptions.[69]

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[63] The *Pharmacopoeia Augustana* was first published in 1564. See A. Adlung and G. Urdang, *Grundriß der Geschichte der deutschen Pharmazie* (Berlin 1935), 318.

[64] Ibid., a4r-b2r. Joannes Christophorus Hochwidtner mentions the teaching of Zwelfer in Padua, and an anonymous "G. C. S." dates his greetings from Padua. Schaidenperger contributed a longer epigram and a chronogram (dated to 1651) to the volume (b1r). In a similar vein, the *Hercules medicus* of Wolfgang Höefer, one of the physicians of Emperor Leopold I, was greeted by a number of doctors closely connected to the Vienna court, and Schaidenperger signed his gratulatory epigram there already as a doctor of the fortress Győr in Hungary. W. Höefer, *Hercules medicus sive locorum communium medicorum tomus primus* (Vienna: J. J. Kürner, 1657), 4r.

[65] Johann Zwelfer, *Animadversiones In Pharmacopoeiam Augustanam, Ejusque Mantissam* (Nuremberg: Endter, 1657).

[66] Johann Zwelfer, *Animadversiones ... Tertium Revisae, cum Appendica Annexa ... adiecta Mantissa Spagyrica* (Nuremberg: Endter, 1667).

[67] On the basis of their different headcovers, I would identify them with the six alchemists, who appear on the title page of the 1608 edition of the *Basilica chymica* of Oswald Croll: Hermes Trismegistus, Geber Arabs, Morienes Romanus, Rog. Bacchon Anglus, R. Lullius Hispanus, Th. Paracelsus Germanus. Cf. Osvaldus Crollius, *Basilica chymica* ([Francofurti]: Godefridus Tampachius, 1608).

[68] Johann Zwelfer, *Pharmacopoeia Regia, seu Dispensatorium novum locupletatum et absolutum cum annexa Mantissa spagyrica* Joannis Zwelfer Palatini, M.D. (Nuremberg: Endter, 1668).

[69] Cf. ibid., 7r-v. Zwelfer's plea for pharmaceutical medicine can be closely paralleled to the ongoing controversy between Galenist and chemical medicine in many other countries of Europe. See e.g. P. M. Rattansi, "The Helmontian-Galenist Controversy in Restoration England," *Ambix* 12 (1964), 353–75; B. T. Moran, *Chemical Pharmacy Enters the University: Johannes Hartmann and the Didactic Case of Chymiatria in the Early Seventeenth Century* (Madison, WI 1991).

In accordance with his iatrochemical ideas, Zwelfer added a short *Mantissa spagyrica* (Alchemical appendix) to the 1667 edition already, which he greatly extended for the *Pharmacopoeia regia* published in 1668.[70] This new version of the *Mantissa* included already a criticism of Kircher's *Mundus subterraneus*, and especially of his rebuttal of alchemy. Whereas Kircher criticises the obscure language of alchemical texts, Zwelfer justifies the use of allegories with the claim that it is needed for the secrecy of the art. To Kircher's charge that the alchemists disagree on many issues among each other, Zwelfer replies that disagreement is a general characteristic of philosophical discourse. If God has not uncovered the secret of making gold to his saints, it was only in order to save them from the burden of richness, and to the many questions that Kircher raises about Paracelsian practice, he will find an answer in the works of van Helmont. According to Zwelfer, the most important proof of the possibility of making gold is the success of former experiments, and the existence of real pieces of artificial gold. Van Helmont mentioned such successful transmutations in his works, and if Kircher did not believe him, he should believe Emperor Ferdinand III, whose golden coin, produced by Johannes Richthausen (Baron von Chaos), was then already in the possession of Emperor Leopold I and kept in his private chamber.[71] Moreover, if Kircher had still any misgivings about the possibility of transmutation, Zwelfer would have to cry out quoting Conrad Wechtler, the chief physician of Emperor Ferdinand III and Leopold I: "Who would not believe that the art of making gold was shared with men, when it was known to the benevolent spirits, and angels eminently possess this secret?"[72] In fact, Zwelfer could have hardly stated it more obviously that the possibility of alchemical transmutation was accepted in the imperial court on the highest level, and both Ferdinand III and the reigning Emperor Leopold I were firm believers in transmutation.

In the same year, an even harsher attack against Kircher's judgment on alchemy came from a practitioner of the art. Compared to Schaidenperger's sincere disappointment and Zwelfer's modest corrections, the pamphlet entitled *Interpellatio brevis ad philosophos pro lapide philosophorum* (A short interpellation, Biel/Bienne [?], 1667) by a certain Salomon de

[70] The *Mantissa*, which was 25 pages long in the 1667 edition, became 104 pages (cf. ibid., 314–418).

[71] Ibid., 324–28, for the golden coin of Ferdinand III, ibid., 328–9. About Richthausen, Baron von Chaos, see Soukup, 428–431 (n. 52).

[72] Ibid., 329. Zwelfer refers to the *Liber secundus de homine occidente* (disput. 3. difficult. 6.) from the *Homo oriens et occidens* of Johann Conrad Wechtler (Frankfurt: Wechtler, 1659), 41–2, which was similarly dedicated to Leopold I. In fact, Wechtler only raises the question, if the angels are capable of changing material substances, while Zwelfer positively attributes this opinion to him. This is a further proof that Zwelfer manipulates his references in order to stress the strong support of the imperial court on his side.

Blawenstein did not fall short of a violent verbal aggression.[73] Despite the somewhat mythological sounding pseudonym,[74] the author seems to have changed his name only in part: Leibniz identified Friedrich Meurs von Blewston/Blauenstein as the author of this anti-Kircherian invective in his correspondence.[75] In fact, it seems that his work was well remembered in Leibniz's circles, and he was known for vainly boasting of having created gold out of silver by adding salt.[76]

This *Interpellatio brevis* questioned Kircher's authority already on its title page, by calling his anti-alchemical arguments made-up, while Blauenstein proclaimed himself the "real student of this art." Blauenstein also claimed that Kircher, whose clear vision was blinded by having resided so long in the subterranean worlds, could be called but a dabbler in matters of alchemy, although he might have contributed to the development of other scientific fields.[77] As most of Kircher's arguments were superfluous ("the words of Thersites," *verba Thersitis*), Blauenstein decided to confute only the statements which targeted disagreements between alchemists. As Kircher claimed, the students of the art could not define clearly what they meant by the philosophers' stone, they named it variously, though they were hardly able to produce it according to the recipesfound in the alchemical texts.[78] Against these epistemological doubts concerning alchemy, Blauenstein replied that obscurity belonged to the essence of alchemy: quoting the Proverbs of Solomon ("Wise men lay up knowledge: but the mouth of the fool is next to confusion"), he claimed that alchemical secrets resemble the mysteries of faith, and great social confusion would follow their eventual revelation.[79] There was factual evidence for the existence of the *lapis philosophorum*; in fact, its spirit is capable of permeating not only metals, but wood, as well: "Such a [golden] piece, born into a branch and growing out of it, was shown to me by a very illustrious Hungarian magnate in 1663 at the Imperial Diet in Regensburg. I have held in my own hands many golden branches grown

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[73] Salomon de Blawenstein, *Interpellatio brevis ad philosophos veritatis amatores, quam scrutatores pro lapide philosophorum, contra antichymisticum Mundum Subterraneum P. Athanasii Kircheri Jesuitae* ([Biennae apud Bernates], typis Desiderii Suitzij, 1667). It is very possible that "Biennae" is only a purportedly distorted form of "Viennae."

[74] When the Jesuit Gottfried Kinner informed Kircher about this attack against him, he guessed that it must be a pseudonym, and at the same ridiculed the author of this pamphlet. APUG, ms. 564, 1r-v.

[75] G. W. Leibniz, *Sämtliche Schriften und Briefe*, ser. 3, *Mathematischer, naturwissenschaftlicher und technischer Briefwechsel, Juli 1683-Dezember 1690*, vol. 4, ed. by H.-J. Heß, J. G. O'Hara, and H. Breger (Berlin 1995), 120 (n. 57, 23 July 1684).

[76] Ibid., 188–9 (n. 76).

[77] Ibid., a2v.

[78] Ibid., a3r-v. Salomon von Blauenstein summarises the criticism of Kircher against alchemy in seven points.

[79] "Sapientes abscondunt scientiam, os autem stulti confusioni proximum est" (Proverbs 10:14). The Proverbs of Salomon might have inspired Friedrich Meurs von Blauenstein in choosing his own pseudonym. Cf. ibid., a3v-a4r.

on vine near Tokaj."[80] Kircher, who was not initiated into alchemical practices, and often selectively or distortedly quoted his sources, was not a truthful critic of alchemy, or its greatest authors, Paracelsus and Sendivogius. In sum, according to Blauenstein, the greatest problem with Kircher's approach to alchemy was his dilettantism and his little or no practical experience in the field.[81]

Unlike Schaidenperger's criticism, the work of Blauenstein seems to have reached wider circulation. As we have seen, he was read in Leibniz's circles, and the text was republished more than thirty years later in Manget's *Bibliotheca chemica curiosa*[82] along with later responses to the *Mundus subterraneus*.[83] Although we do not have any documentary evidence about his Viennese contacts in this period, it seems quite possible that Blauenstein was personally connected to Zwelfer and the imperial court, as Schaidenperger mentions his pamphlet in his third letter to Kircher next to Zwelfer's *Mantissa*.[84] Similarly, Zwelfer, the major medical authority of Vienna, had no qualms about publishing his criticism of Kircher. If we compare the success of Schaidenperger, Zwelfer and Blauenstein in reaching a wider public, the history of this debate clearly demonstrates the limitations of epistolary communication in comparison to print.

Conclusions

Kircher's public image was clearly blemished after the publication of the *Mundus subterraneus*: more and more readers started to attribute the decreasing quality of his work to his aging and to the many visitors he received in Rome, and even his fellow Jesuits had less confidence in him.[85] Despite the positive response which might have followed a public critique, none of the reactions to Kircher's work from Hungary would be published in the seventeenth century, and the manuscript sources remained inaccessible to interested readers for a long while. Misch's accounts of light phenomena and his alchemical experiments lay

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[80] Ibid., c1v.

[81] Blauenstein's judgment stands close to the modern appreciation of Kircher's hermetic research: C. Gilly, "Ermetismo per turisti, ovvero come fare di Ermete un pezzo da museo: Athanasius Kircher," in vol. 1 of *Magia, alchimia, scienza dal '400 al '700, L'influsso di Ermete Trismegisto*, ed. by C. Gilly and C. van Heertum (Venice and Amsterdam 2002), 483–507.

[82] *Bibliotheca chemica curiosa*, ed. by Johann Jacob Manget ([Coloniae Allobrogum]: Chouet et al., 1702), 113–19.

[83] Gabriel Clauder, *Dissertatio de tinctura universali (vulgo Lapis Philosophorum dicta)* (Altenburg: Richter, 1678).

[84] APUG, ms. 559, 204r. (Nagyszombat, 6 Dec. 1669).

[85] See e.g. the letter of Adam Adamandus Kochański to Leibniz (7 June 1670), where the Prague Jesuit calls Kircher apologetically "senex," and excuses the small amount of his mathematical publications with Kircher's lack of time because of tourists. G. W. Leibniz, *Sämtliche Schriften und Briefe*, ser. 2, *Philosophischer Briefwechsel, 1663–1668*, vol. 1 (Berlin 2006), 78–9.

long in the archives of Rome, about the alchemical experiments of Archbishop Lippay we have only second-hand information in the letters of Schaidenperger, and Kircher had obviously no intention of publishing the series of letters addressed to him by Georg Schaidenperger, who remained a firm believer of Paracelsian medicine and alchemy despite the Roman admonitions. The failed publication project of the mineralogical collection of Procopius Bonanus shows that there were not enough local resources to finance the publishing of such a large scale scientific enterprise, even if the Viennese doctor was patronised by Archbishop Lippay and Ferenc Nádasdy, the judge of the royal court. Only those reports from Hungary could be published which were filtered and judged positively by Kircher, as it happened in the case of the Schemnitz mining processes. Under these circumstances, courtly science, the primary context of scholarly patronage, remained necessarily secretive in Hungary and did not aim at reaching a wider public. This communicational situation fitted very well with the search for the "miracles of the country" and the practice of alchemy, where obscurity and inaccessibility were stipulated in the research. The certain popularity which the miraculous natural features of Hungary enjoyed in early modern alchemical works might be related to the meagre communication lines between the war-ridden country and the international intellectual world. As we have seen, the Jesuit Andreas Schaffer praised exactly the miraculous features of the subterranean world in Hungary, and Kircher accepted the role of mediating the wonderful natural resources of the country ("naturae, quibus Hungaria abundat, miraculis") to the world in his letter to Archbishop Lippay. The fragile scholarly infrastructure of the country was in a way predisposed to communicate miracles instead of the ordinary. The primary method of reaching the international public from within the country was through epistolary exchange, thus the local intellectuals had to rely continuously on the benevolence of mediators and scientific patrons who played a major role in the international republic of letters. Speaking through mediators had obvious consequences: On the one hand, the transmitted information tended to be poignant in order to break through, thus spreading the fame of the "miracles" of the country. On the other hand, information was necessarily filtered, and figures such as Georg Schaidenperger or Johann Misch—even if sharing the confessional and patriotic allegiances of their scholarly patron, Kircher—did not have their scholarly observations published.