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ON LEARNING LOGIC IN 17th CENTURY TRANSYLVANIA[1]

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ABSTRACT. The purpose of this paper is to provide a glimpse on the method and content of teaching logic/dialectic in the Principality of Transylvania in the 17th century from the perspective of Miklós Bethlen with references to two important local scholars: Pál Keresztúri and Janos Apáczai Csere, who is better known as being the first Hungarian encyclopaedist. In addition to this, the paper will contain for comparison a short survey of what Jan Amos Komenský had to say about teaching logic.

Keywords: *Logic, dialectic, teaching method, Miklós Bethlen, Pál Keresztúri, Janos Apáczai Csere, Jan Amos Komenský*

I.

Miklós Bethlen (1642-1716) was a Hungarian Protestant writer and statesman, the son of János Bethlen (1613-1678), the chancellor of Transylvania between 1659 and 1678. As it becomes obvious from his extant autobiography (Bethlen 2004), Miklós Bethlen had, given the polymathic intellectual climate of the age, many other interests: languages, educational method, architecture, etc. In his youth, he was subject to the application of educational reforms initiated in Transylvania by figures such as Janos Apáczai Csere (1625–1659) or Jan Amos Komenský (Comenius, 1592–1670), but also lesser known educators such as Pál Keresztúri (1594?–1655).

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The developments regarding educational methods in Hungary and Transylvania were linked to what was happening in the West. For example, in addition to foreign professors who were teaching at institutions of higher education – Johann Heinrich Alsted (1588–1638), Johann Heinrich Bisterfeld (1605–1655), and Philipp Ludwig Piscator (?–1647) in Gyulafehérvár (today Alba-Iulia), Jan Amos Komenský in Sárospatak – the local intellectuals studied and/or were in touch with their Western colleagues such as some of the members of the Hartlib Circle (cf. Murdock 1996, Hotson 2020). In terms of knowledge dissemination between the center and the periphery, instead of translational, monographic or systemic purposes, the endeavors of influential figures such as Janos Apáczai Csere are often seen as an adaptation of knowledge to the needs and wants of the periphery (Pallo 2006, 780): "These textbooks adapt universal knowledge to the local intellectual, pedagogical, institutional, very often political environments. By their help, universal knowledge translates into a specific local knowledge without losing its universal character." It can be reasonably inferred that something at least similar happened in the case of the study of logic or dialectic.

In this paper, my aim is to offer a glimpse of what and how was being taught within the fields of logic and dialectic around the middle of the 17th century in the Principality of Transylvania from the perspective of Miklós Bethlen, especially his relationship with the first Hungarian encyclopaedist, Janos Apáczai Csere. The latter is not celebrated for an innovative contribution to a specific field of knowledge, logic and dialectic not excepting; contrariwise, it is a known fact that more celebrated logicians – however still marginal from the point of view of classic histories of logic (such as, for instance, Kneale 1962) – were present and active in Transylvania around that time, e.g. Alsted and Bisterfeld. There was a strong and vital link between the displaced scholars of the Heborn Academy and, one the one hand, Jan Amos Komenský in Sárospatak (cf., for example, the three letters to Bisterfeld in 1652–1653), on the other hand, Janos Apáczai Csere (cf. Murdock 1996, 72, 79, et passim; Szentpéteri 2008, passim; Almási 2015, 2–3; Hotson 2020, 352–353). Bethlen follows his teachers in deploring the sad state of the Transylvanian *elite* in terms of learned competence. Following Pal Keresztúri, some standard reasons are invoked by Bethlen: lack of a competent teaching staff, lack of a proper educational method, the custom of viewing school as useless and early abandonment. The results are derided in general lines: for example, the nobles of Transylvania do not possess even a mediocre knowledge of Latin even though they spent almost twelve years learning it; a reasonable logical knowledge is lacking as a consequence of absurd laws, contradictory with each other in many cases, doubled with incompetent legislators, judges and lawyers. The boys are brought to school in an "asinine state"

and they leave school twelve years later being "even bigger asses", this time all the more dangerous, since the destiny of their community lies in their hands (Bethlen 2004). Something similar is said by Janos Apáczai Csere when he underlines in his *Oratio de studium sapientiae* (*A bölcsesség tanulásáról*) that without serious studies in dialectic and logic the people of Transylvania risk looking at things like "a dumb calf stares to a new gate." (Apáczai Csere 1976, 38-39)

The study of logic in Transylvania needs to be considered in the light of the Ramist influence on its teaching, related to a utilitarian purpose. As will become apparent later, one of its applications was in the context of local theological disputes.

Histories of logic and argumentation, again, do not give much credit for originality even to such significant figures as Pierre de La Ramée (Petrus Ramus, 1515–1572), not to speak about Ramists, semi-Ramists, post-Ramists and scholars who taught logic at the "periphery", such as was the case of Alsted and Bisterfeld. For example, in William and Martha Kneale's *The Development of Logic* Ramus is mentioned as an essential member of the Humanist cohort (among Valla, Agricola, Vives and others) that led a charge against the reputation of medieval logic (cf. Kneale 1962, 300–306); in Józef Maria Bocheński's *History of Formal Logic,* Ramus is mentioned few times as perhaps the first historian of logic ever, having at the same time, however, an overactive imagination. As Father Bocheński does not forget to say, Ramus counts even the patriarchs of the Old Testament among logicians. Bocheński, however, definitely oversimplifies when he counts Ramus – and perhaps also Bartholomaeus Keckermann[2] who "seems to have given only a cursory reading to most of the logicians he cites" – among Humanists (Bochenski 1961, 4–5, 255). The situation seems to improve for Ramus at least in a more recent, collectively written scholarship on the history of logic (cf. Ashworth 2008). However, in the cases of Alsted, Bisterfeld or Apáczai Csere, the situation is the same: no mentions. In general, Humanists and Ramus are usually mentioned in the histories of logic just because historiographical necessity requires it, but not because they are considered important in themselves.

II.

The two most influential figures regarding educational reform in Transylvania in the 17th century were the native Janos Apáczai Csere and the better-known Moravian Jan Amos Komenský. The educational methods of both influenced the curricula of the schools from the Principality of Transylvania. And this is natural, not

[2] On Keckermann, see the comprehensive study of Facca 2005.

only because of the physical presence of both in the region during the middle of the 17th century (Komenský in Sárospatak; Apáczai Csere in Alba-Iulia/ Gyulafehérvár and Cluj/Kolozsvár), but also because of the parallels between the two. Miklós Bethlen in his *Autobiography* (*Gróf Bethlen Miklós önéletírása*; Bethlen 2004, 72 sqq) offers a relatively detailed account of his early studies in the Principality, before going abroad to further his studies in the West (Heidelberg, Utrecht, Leiden, etc.). While his relation to Apáczai Csere is evident and direct, his relation to Komenský appears to be only mediated by another of his teachers, considered extremely important by Bethlen himself, Keresztúri Bíró Pál, who was influenced by Komenský.[3]

The first teachers of Miklós Bethlen were Mihály Naményi and Mihály Fogarasi, about which we do not have much extant knowledge. Afterwards, he started to study under Pál Keresztúri, who has also been the teacher of his father, János Bethlen (1613-1678), the Chancellor of Transylvania between 1659 and 1678. His initial studies consisted of Latin and Hungarian. In 1652, the pupil and the teacher were both in Gyulafehérvár (today Alba-Iulia). As recounted by Bethlen, the methods used for teaching so far, especially by Fogarasi, implied various forms of punishment which he resented, and which he was fortunately spared under Pál Keresztúri. During this time, Bethlen also had another tutor, Bálint Békési, but he and his fellow students preferred to attend Pál Keresztúri's lectures, and thus János Bethlen agreed to leave him under the tutelage of Keresztúri until 1655, the year when Keresztúri died. Bethlen insisted that the method and teachings of Keresztúri were not well received in Transylvania because of the "arrogance of the educated and the ignorance of the uneducated" (Bethlen 2004, 73). Pál Keresztúri was well known locally not just as a teacher, but also as a preacher. As others, he travelled abroad (Germany, the Netherlands, England, etc.) to further his studies, and his good relationship with the princes of Transylvania ensured his appointment to important teaching and academic administrative positions in the Principality. He was also known as a fervent debater on political and confessional issues, studies of dialectic being highly relevant in this respect (for more details about his life and education see Dénes 2001). The pedagogical context in which Pál Keresztúri was formed has already been influenced by Ramism regarding methods and contents, the Hungarian puritans being open in adopting Ramus' educational reform proposals

[3] Regarding Bethlen's education under Keresztúri Bíró Pál, the details are taken from Bethlen 2004 – Part I, Chapter 8 and 9. For his studies under Apáczai Csere, see Bethlen 2004 – Part I, the last part of Chapter 9 and Chapter 10). Regarding a possible contact with educational works by Komenský during Keresztúri's tutelage he states that he have not yet had an opportunity to study works by the Moravian educational reformer (Bethlen 2004, 77). For his studies under Keresztúri, see Bethlen 2004, 72–80.

it is to be expected that this also happened with regard to the particular case of the teaching of logic (cf. Dénes 2001, 47–48, 78). It is most important to emphasize the way in which logic was taught, that is, together with other basic studies of grammar and rhetoric (i.e. *trivium*), with an orientation towards accumulation of encyclopaedic knowledge and with the final purpose of preparing the student to grasp theological topics and eventually developing a debating ability as Pál Keresztúri himself did (see e.g. Dénes 2001, 51).

First of all, as indicated, Keresztúri did not employ violent means in order to educate his pupils preferring to praise them and reward them with fruits and gifts to give them more freedom while conversing in both Hungarian and Latin (Bethlen 2004, 74–75). This reminds us of Komenský's view on avoiding violence in education. In fact, Keresztúr's actual motto, recorded by Bethlen, was Comenian: "*Omnia sponte fluant, absit violentia rebus*" (Everything should flow naturally, violence should be absent from things). The examples and texts chosen for study were rather fun to read so that the pupils will not get eventually bored (Bethlen 2004, 75). This, again, reminds us of Komenský's *Schola ludus seu Encyclopaedia viva*, the didactic play written in 1654 and composed to be performed at the gymnasium in Sárospatak as a pedagogical tool.

Keresztúri also preferred to start with teaching the children reading and writing (via syllabication) in their native Hungarian, based on the principle that a child learns to read faster in a language he or she knows and understands already before in speaking and listening (Bethlen 2004, 74). Reading was taught in parallel with writing, the words to be learned being written down by the pupils in both Latin and Hungarian on paper and thus the memorization process was reinforced. This principle reminds us the method of Komenský's famous *Ianua linguarum reserata* (first published in Leszno, 1631), which provided the student with the mother-tongue and Latin (or other foreign) text in parallel columns, and also the later *Orbis sensualium pictus* (written in Sárospatak, 1652–1654, and first published in Nuremberg, 1658).

Keresztúri used to jump from one language to the other and then back. Instead of rote learning he employed a more flexible method (Bethlen 2004, 75): he used to teach things from "smaller to greater", illustrating his teachings usually by particular examples (Bethlen 2004, 74). So, in the case of grammar, he did not insist on theory, but rather examples and practice, using the *Colloquia* by Corderius and an illustrated Bible (Bethlen 2004, 75). After the students acquired the rules by this method, he continued with the direct study of texts, chosen depending on the learnt vocabulary (Bethlen 2004, 75). At this level, he started to focus more on dictating, the most complex practice being that the dictation was in one language while what the student wrote down was in the other. Also, the students were being

introduced to basics of composition, furnished with several words based on which they wrote their own piece (Bethlen 2004, 75). He then proceeded to prosody and the writing of poetry (Bethlen 2004, 75–76).

When it came to other foreign languages, the order was to be one by one, moving from one to another after mastering a good deal of basic vocabulary (e.g. after learning Latin, the Bethlen had to learn 1000-2000 words in *walachian*, i.e. Romanian, and so on, Bethlen 2004, 78). As regards to the other disciplines of the classical *trivium*, it seems that he considered it inopportune, at least at that level, instead, students were to actually get acquainted with other things such as natural studies of things together with names, genera, species and specific qualities, and only thereafter to pass on to rhetorical and poetic compositions (Bethlen 2004, 76; cf. the same order of studies in Komenský). The next item in the order of teaching Keresztúri taught his pupils were logic, philosophy and theology (Bethlen 2004, 76; for more on logic/dialectic see below, section III). Finally, at some point Keresztúri considered that it was an opportune moment to teach Bethlen rhetoric by way of examples (Bethlen 2004, 78).

With regard to the *quadrivium*, it seems that Keresztúri only taught the first part of arithmetic, while the others were taught to Bethlen later by Janos Apáczai Csere (Bethlen 2004, 78). Now, let us pass on to the content of his logical teaching.

The teaching was not done using textbooks, but rather excerpts. Bethlen recognized excerpts from Aristotle or Aristotelian authors; he also mentions Ramus and the *Logica* of Keckermann (Bethlen 2004, 77). The organization of these excerpts was in the form of questions and answers, this being the method of teaching of Keresztúri in logic, metaphysics or theology. Bethlen gives several examples of the didactical practices in logic: "*Quaestio: Quid est genus?*/ What is the genus? *Vel species?*/ Or a species?/ *Responsio*/The answer was the definition" (Bethlen 2004, 76). And these were learned by a modified form of repetition, employed also in teaching syllogistic, the next step in the teaching of logic after the elements were grasped by the pupils (Bethlen 2004, 77). After these, the students needed to master the writing of arguments (equivalent to the writing of poetry in language studies) on given topics. Bethlen adds jokingly that the arguments he produced could be compared to those of Raimundus Lullus (Bethlen 2004, 77). Keresztúri's instruction in logic had a quite practical purpose and result, the ability to debate in public. Bethlen recounts that Keresztúri was derided by his contemporaries because of his methods, but was eventually vindicated in public debates in which Bethlen himself, Keresztúri's pupil at the age of 12–13, participated (among others, in front of Bisterfeld and Prince Rakoczi), and in the end Bethlen received the nickname of "the little philosopher" because of his grand dialectical ability at such an extraordinarily young age (Bethlen 2004, 77–78).

III.

While in the case of Pal Keresztúri we do not have extant writings dedicated to the study of logic *per se*, the situation in the case of Apáczai Csere is more fortunate. Apáczai Csere was obviously very close to Keresztúri and it seems that his position in Cluj, towards the end of his comparatively short life, was obtained by the intervention of the latter, and this happened after Apáczai Csere had entered into a conflict with the local professors of Alba Iulia, where he was teaching for a time after his return from abroad. After Apáczai Csere came home, he received the Professorship of poetics in Alba Iulia; however, instead of teaching the customary contents of the curriculum, using the *Georgics* of Vergil, he began to teach physics, astronomy and geography, which made him a successful professor who attracted many students. Bethlen writes that this brought him the enmity of Bisterfeld (although the *Hungarian Encyclopedia* is dedicated among others to Bisterfeld too) and also other professors, and at some point he was even threatened to be thrown out of the tower of Alba Iulia (Bethlen 2004, 83).

After Keresztúri, Apáczai Csere was the other great teacher that Bethlen admired the most and it seems that he himself received praise from his teacher being called *optimus* and *charissimus discipulus* (Bethlen 2004, 83). Apáczai Csere was the one who brought order upon the chaotic knowledge, *confusum chaos*, that Bethlen acquired up to that point. He managed this via systematic public and private teaching: theology via William Ames (Guilelmus Amesius, 1576–1633), philosophy via René Descartes (Renatus Cartesius, 1596–1650) and Hendrik de Roy (Henricus Regius, 1598–1679), arithmetic via Petrus Ramus, and geometry via Adriaan Metius (1571–1635). It seems that at some point they had problems in acquiring instruments for the teaching of mathematics (Bethlen 2004, 84–85).

Regarding the teaching of logic in the case of Apáczai Csere, we can consider the following two sources: *Magyar Encyclopaedia. Az az, Minden igaz es hasznos Böltseségnek szép rendbe foglalása és Magyar nyelven világra botsátása* (The Hungarian Encyclopedia. That is, the right arrangement of all true and useful wisdom given to the world in Hungarian), published in Utrecht, 1653–1655; and *Magyar logikácska, mellyet a kitsindedek számára irt Apatzai Janos, egy a' tudomány dolgában meg kivántatot tanatstsal egyetemben* (A Short Hungarian Logic, which was written by Janos Apáczai for the young students, along with an introduction to science), published in Alba Iulia, 1654. Apáczai Csere is quite open when it comes to mention the sources of his textbook:

> "Thus, according to the diversity of subjects, the authors I follow are: in metaphysics Cartesius; in logic, Ramus and Amesius; in arithmetic, Ramus, Snellius, Schonerus; in geometry it was only Ramus (because it is a crime to confuse his method (...) the dichotomies (...) were mostly omitted from the so called twelfth edition in Hanover. I had to wonder whether such a systematic writer had forgotten his own method so much; I only realized later that it was the publisher's fault); in general science Cartesius and Regius; in astronomy, Copernicus, Cartesius, Regius, Phocylides, Alstedius, Scribonius; in geography, hydrography and music, Alstedius; in meteorology Cartesius, Regius and Scribonius; in anthropology, Scribonius and Regius; Regius alone in medicine; in zoology, Regius, Scribonius and Alstedius; in mineralogy Scribonius, Regius and Alstedius: in botany Scribonius and Regius; in mechanics Alstedius, Amesius, Metius; in ethics, economics, politics, law and theology Fennerus, Amesius, Althusius, etc.; in general grammar, Ramus; in special Greek and Latin grammar also Ramus, in Hebrew and its dialects Martinius, in Arabic Erpenius; in general rhetoric Talaeus, in special Greek, Hebrew and Arabic rhetoric different writers, and in Latin Talaeus."[4] (Apáczai Csere 1959, 34–37; 1977, 84–85)

Apáczai Csere treats dialectic and logic in the second and third parts of his *Encyclopaedia*. The contents are the following:

[4] Or in Hungarian: "Így hát az általam követett szerzők a tárgykörök különfélesége szerint a következők: a metafizikában Cartesius; a logikában Ramus és Amesius; az aritmetikában Ramus, Snellius, Schonerus; a geometriában csak Ramus (véteknek tartottam ugyanis összezavarni az ő módszerét, egy dolog kivételével, hogy tudniillik az ő kommentáraiból nem kis fáradsággal összekeresgettem és napfényre hoztam a dichotomiákat, melyek többnyire kimaradtak a hannoveri, úgynevezett tizenkettedrét kiadásból. Mivel történetesen ez az egy kiadásom volt, csudálkoznom kellett, hogy ilyen módszeres író ennyire megfeledkezett saját módszeréről. Csak később jöttem rá, hogy ez a kiadó hibájából történt); az általános természettudományban Cartesius és Regius; az asztronómiában Copernicus, Cartesius, Regius, Phocylides, Alstedius, Scribonius; a föld- és vízrajzban, valamint a zenében Alstedius; a meteorológiában Cartesius, Regius és Scribonius; az antropológiában Scribonius és Regius; az orvostudományban egyedül Regius; a zoográfiában Regius, Scribonius és Alstedius; az ásványtanban Scribonius, Regius és Alstedius: a botanikában Scribonius és Regius; a mechanikában Alstedius, Amesius, Metius; az etikában, ökonómiában, politikában, jogtudományban és teológiában Fennerus, Amesius, Althusius stb.; az általános grammatikában Ramus; a speciális, mégpedig a görög és latin grammatikában ugyancsak Ramus, a héberben és annak dialektusaiban Martinius, az arabban Erpenius; az általános retorikában Talaeus, a speciális, mégpedig a görög, héber és arab retorikában különböző írók, a latinban viszont Talaeus." For a discussion of Apáczai Csere's background, inspiration, studies, and contributions as an encyclopedist, see Hotson 2020, 352–359. For a visualisation of Apáczai Csere's sources, see *ibid*., p. 357.

Hungarian	English
II. Dialektika. A dolgoknak közönséges tekintetei és azoknak feltalálások - Ok-okozat - Ellentmondások - Rész-egész - Bizonzosság	II. Dialectic. On the ordinary view of things and their finding/invention - cause-effect - contradictions - part-whole - certitude
III. Logika. A dolgoknak egybeköttetett tekintetek - Következtetés - Szillogisztika - Általánosítás - Származtatás	III. Logic. On the gaze at things in an interconnected manner - consequence/inference - syllogistic - generalization - derivation

The direct source of Apáczai Csere, as for the second and third parts of his *Encyclopaedia*, is Ames – his *Demonstratio logicae verae* (1632) is actually an explanation of Ramus' *Dialectice libri duo*. He also partially relies on Ramus' texts. However, Apáczai Csere does not link logic and dialectic with grammar and rhetoric in the fashion of Ramus; instead they are used as tools for science. As regards content, Apáczai Csere is mostly unoriginal since all he usually does is a fragmentary translation from the textbooks he encountered in his studies abroad. And he justifies this, since „borrowing" from great predecessors was what many prominent authors have done (Apáczai Csere 1959, 38–42; 1977, 85–87). The content of the *Magyar logikácska* is compiled analogically, but this time it is intended for the education of younger students, the first part starting from ontological concepts, discussing causes, genera, species, definitions, etc., and the second part being dedicated to argument construction.

Another place where we can find information about Apáczai Csere's views on logic is the *Oratio de studium sapientiae*, published as an appendix to the *Hungarian Encyclopaedia* in Utrecht in 1655 (Apáczai Csere 1976). Here, logic and dialectic are considered in the light of a Platonist, Neo-Platonist, and Ramist traditions, i.e. as a "divine gift", the logical method being "stolen" for the benefit of humanity by a Prometheus (cf. the *Philebus* of Plato, 16c). The question tackled by Apáczai Csere was the following: why is encyclopaedic knowledge fundamental and why logic, as an essential part of it, relevant?

Dialectic and logic were taught as a fundamental part of encyclopaedic learning. Encyclopaedic knowledge is essential to understanding and explaining the Bible (Apáczai Csere 1959, 16–17; 1977, 75–76). Also, it has a utilitarian purpose

regarding human life (Apáczai Csere 1959, 42; 1977, 87). Apáczai Csere's encyclopaedic endeavours were inspired, as he professes, by the *Encyclopaedia* of Alsted (Apáczai Csere 1959, 16–17; 1977, 76). Apáczai Csere emphasizes the importance of efficient memorisation, and requires any student to write down common places when he or she studies his *Encyclopaedia* (and any other book for that matter). Practical exercise and use of memory are to be intertwined in this respect (see Apáczai Csere 1959, 50–52; 1977, 90–92; see also Hotson 2020, 353).[5]

IV.

Did these studies of logic and dialectic have any result and significant improvement on the person of Miklos Bethlen, besides, as we have seen above, him being named the "little philosopher" in the age of c. 12? If we are to believe what he wrote in his autobiography, then the answer is yes. An interesting detail about what Pál Keresztúri taught is the one related to the teaching of *Localis memoria* and *Ars Lulliana*, something that he only taught, somewhat similar to the Sophists of Ancient Greece, to earn money (see Bethlen 2004, 74; cf. Dénes 2001, 94–95). Bethlen expresses ambivalent thoughts about this art of memory: he does not consider all of it to be a genuine art, on the other hand, he himself found and developed a personal method of memorization. This memorization of common places was an essential part of dialectical and logical knowledge insofar as the use of common places is used in the actual practice of argumentation when the arguer is required to produce a proof or an authoritative passage in order to force consent from his or her. Since, as mentioned above, these argumentative encounters were in many cases dedicated to theological issues, or because authoritative passages from the Bible had a highly persuasive value in debates about other matters as well, it can be surmised that the art of memorization was mainly concerned with biblical content, and only eventually, secondarily, with *loci* from classical authors.

It seems that Keresztúri's sophistic endeavours were quite expensive. Credulous aristocrats, Transylvanian "Calliasses",[6] were the perfect victims of the charming "secret" methods, promising to bestow a perfect memory to anyone who

[5] It seems that Apáczai Csere read Joachim Sterck van Ringelbergh (Joachimus Fortius Ringelbergius, c. 1499–c. 1531), *De ratione studii*. Cf. Apáczai Csere 1959, 26–27, 52; 1977, 80, 91–92. In a parallel, Komenský strived to boost diligence of his pupils in Sárospatak using two works of the same name – *De ratione studii* – by Erasmus (Strasbourg, 1512) and Fortius (Antwerp, 1529). However, he was unsuccessful. As a follow-up, he wrote his own work for this purpose: *Fortius redivivus* (written 1652–1654 in Sárospatak, first published 1658 in Nuremberg). Cf. Murdock 1996, 98.

[6] For who was Callias, one of the wealthiest Athenians who could afford an education in Sophistry, see some of Plato's dialogues (e.g. the *Apology* or the *Protagoras*).

needs to impress his acquaintances or adversaries with his or her knowledge of the Bible. First of all, Keresztúri dismissed his pupils when a nobleman came to learn the secret wisdom of the *loci*. Bethlen mentions at least two Calliasses, Kemény Ferenc and Bocsárdi Ferenc. Keresztúri proceeded thus: he excerpted from the Bible a couple of thousands common places and presented them to the student in combination with signs, images and stories (laughable stories in Bethlen's view), in the fashion of Giordano Bruno (1548–1600) and other early modern proponents of *ars memoriae*. And eventually through repetition and psychological inclination towards memorizing ridiculous stories and images, these Calliasses managed to remember at least certain parts of the Bible (Bethlen 2004, 78).

Bethlen, however, derides the efficiency of this method and professes that he was able to develop one of his own, more efficient, which would put him on a par with Keresztúri. For this, Bethlen claims to have found two "secrets" that he considered quite helpful to advance greatly his knowledge of the Bible:

1. One should extract several hundreds or thousands of passages (places) from the Bible considering one of the following two ways of doing it: either considering the biblical books and historical chronological order, or considering an initial classification of common places, i.e., a thematic taxonomy of disputable theological issues. He adds that it is recommended that all these should be written down in different booklets, depending on the chosen criterion. Moreover, the booklets should have two columns, one for questions and one for answers, and then practice should involve covering one of these columns and trying to remember what the answer to the question would be and what the question corresponds to, that is, a certain answer and a passage from the Bible. All this practice and repetition should involve alternation between these, so that the pupil would eventually develop his memory of *loci*.

2. The second "secret" involves the usage of "markers" or "signs" that one needs to put next to every usable common place. It appears that Bethlen believed that the role of these markers is differentiating the common places from the perspective of the possible encountered adversaries – a certain mark will indicate that a locus is efficient against Catholics, another that a common place is usable against Anti-Trinitarians, etc. (cf. Bethlen 2004, 79).[7]

To sum it up, due to the efforts of certain singular scholars and unique networks, the Transylvanian pupils were able to receive logical instruction that became useful later in life, as the career of Miklós Bethlen demonstrates. Even though from pan-European perspective originality was lacking in terms of both method and content, didactics of logic of this sort is a telling evidence of the local,

[7] The most important scholar who has imported Lullism into Transylvanian context seems to be Alsted (Murdock 1996, 79).

Eastern-European reception and adaptation of the top early modern science, considering the diverse interdenominational context of the Principality of Transylvania in the 17th century (Keul 2009), where a good training in dialectic/logic could seriously improve one's chances to win a debate.

Conclusion: Komenský on learning logic

In conclusion, it might be worth of consideration to investigate what Komenský said about the teaching of logic/dialectic.[8] From the beginning, it must be underlined that Komenský was not an advocate of a „dialectical" approach in education, and he considered it to be more important for the pupils to study nature (Lewalski 1994, 204). Although Komenský's perspective in education does not include much details regarding the teaching of logic/dialectic, he is nevertheless influenced by the Ramist approach (via Alsted, e.g. *Theologia scholastica didactica*, first published 1618, Hanau) to method and dialectic from a pedagogical perspective (Triche & McKnight 2004, 53–54; also Ong 1958, 163–164, 298, 305, to name just a few). He proves that he had rigorous training in dialectic through Ramus' writings (see Hubka 1978).

In the *Didactica magna* (written 1633–1638 in Leszno and first published 1657 in Amsterdam as an important part of the first volume of *Opera didactica omnia*) one can find information regarding the teaching of dialectic/logic in relation to matters such as the place of dialectic in the curricular ordering, the necessity of a similar method of teaching as in the case of other disciplines such as grammar, the importance of practical application, and the order of proper teaching from simple to more complex, from the items of knowledge known to the student towards something unknown.

The teaching of dialectic should take place at a pre-university level, in what Komenský calls "Latin-school":

> "[…] in the Mother-School the external sense should be exercised and taught to distinguish the objects that surround them. In the Vernacular-School, the internal senses, the imagination and the memory, in combination with their cognate organs, should be trained and this by reading, writing, painting, singing, counting, measuring, weighing, and committing various things to memory. In the Latin-school, the pupil should be trained to understand and pass judgment on the information collected by the senses, and this by means of dialectic, grammar, rhetoric, and other sciences and arts that are based on principles of causation. Finally, to the University belongs those subjects that

[8] For this topic, see the pioneering but extremely concise contribution of Berka 1972.

> have special relation to the will, namely, the faculties, of which theology teaches us to restore harmony to the soul; philosophy to the mind; medicine, to the vital functions of the body; and jurisprudence, to our external affairs" (Comenius 1896, 408–409).

When it comes to the place of dialectic/logic in the curriculum, Komenský insists that it should not be taught simultaneously with other disciplines from the *trivium* such as grammar or rhetoric. Moreover, before teaching any specific discipline, a general panorama of knowledge should be presented to students. This is done with a twofold purpose and at two levels: at the first level – understanding the role of any discipline and its relation with other disciplines; and at the second level - grasping of the central concepts of any discipline and also understanding the relations between these concepts. Komenský insists that true proficiency involves these and recounts a personal example of bad teaching referring in part to dialectic: "I remember well that, when we began to learn dialectic, rhetoric, and metaphysics, we were, at the very beginning, overburdened with long-winded rules, with commentaries and notes on commentaries, with comparisons of authors and with knotty questions" (Comenius 1896, 274).

After this general outline of sciences and arts is provided, it is important to teach all disciplines in an arranged order. Comenius seems to favor the following ordering: grammar, then dialectic, and then rhetoric. This goes somewhat against the generally accepted method of the *trivium* that involves teaching these three disciplines in parallel. This would be the case because, Komenský insists, "it is impossible to concentrate the mind on any one thing, when it has to busy itself with several things at once" (Comenius 1896, 271). This is explained in more detail later on in a "naturalistic" fashion ("*Nature does not overburden herself, but is content with a little*"), in a chapter discussing the efficiency of teaching and learning: "The mental energies of the scholar are therefore dissipated if he has to learn many things at once, such as grammar, dialectic, rhetoric, poetic, Greek, etc., in one year" (Comenius 1896, 288).

Komenský grounds his method of teaching in what he considers to be a principle of uniformity: "*Nature is uniform in all its operations.*" This means that the teacher should focus mainly on common features and similarities between the objects of learning, not the differences, and on what Komenský calls "the harmony of the universe, and the universal and intimate relations that exist between objects and words." Such uniformity not only warrants but also requires a single method, in order not to confuse students: "The same method of instruction must be used for all sciences, the same for all the arts, and the same for all the languages," and this also involves the teaching of dialectic (Comenius 1896, 292–293).

This natural grounding provides, in order to facilitate learning for students, a propensity towards understanding the essential nature of practice and relevance of practical application: "*Nothing is produced by nature of which the practical application is not soon evident.*" This should be considered as true not only in the case of languages, mathematics and sciences, but also dialectic. This is possible, in Komenský's view, because the student can draw satisfaction if he is able to apply and use what he learns (Comenius 1896, 292).

The recommended sequence of teaching dialectic is the following (similar to the sequences in language learning and later rhetoric): 1. understanding of concepts and references to things by means of genera and species with the purpose of comprehending the classification of things; for this, first, a student needs to understand similarities, and then differences, and this way he will be able to produce definitions of things and understand what is their place in nature; 2. then the student can pass on to questions regarding other (Aristotelian) categories (quality, time etc.) and distinguish between what is necessary and what is accidental or contingent. 3. Only after mastering this, the student is to move on to syllogistic, conclusions grounded on premises; 4. The final step, after sufficient practice in syllogistic, should contain the teaching of argumentative reasoning with the purpose of the student being able to participate in argumentative disputes (Comenius 1896, 348–349).

Komenský also provides illustrations for these:

1. For the learning of conceptual basis:

> "In dialectic, for example, a tree may be taken, and its genus, its species, its relation to other objects, its characteristic peculiarities and the logical definition and distribution of the term may be treated of. We may then proceed to the various ways in which a statement may be made about a tree. Finally, we may show how, by a perfect train of reasoning, and by taking the facts already ascertained as our starting-point, we may discover and demonstrate other properties of a tree. In this way, if, in each case, the use of the rules be illustrated by the same familiar example, the boy will easily master their application to all other subjects" (Comenius 1896, 349–350).

2. For the learning of more advanced reasoning, practice with what the tradition calls the stoic indemonstrables, *modus tollendo ponens* and *modus ponendo tollens*:

> "So too in logic, if the well-known dilemma be given: 'It is either day or night. But it is night; therefore it is not day'; the boy may learn to imitate it by similarly opposing contradictory conceptions to one another. As, 'He is

> either unlearned or learned. But he is unlearned; therefore is not learned'; 'Cain was either pious or impious, but he was not pious'; and so on" (Comenius 1896, 350–351).

At the very end, what can be said of the relationship between Pál Keresztúri and Jan Amos Komenský? Both Keresztúri and Komenský considered visual education very important (Horn 2014, 48). Sometimes Apáczai Csere is considered to be even a disciple of Komenský (Buisson 1882, 1286). But, Pal Keresztúri is also considered as being familiar with the works of Komenský by historians (see Dénes 2001, 96). We can corroborate it as highly probable, given what we have described above. However, the intellectual-genealogical ancestry is much clearer in the case of Komenský–Apáczai Csere relationship: they both were students of Alsted, the first at the Herborn Academy in 1611–12, and the second later in Alba Iulia (see Hotson 2020, 211). Still, there is much work to be done in research on the intellectual genealogy of early modern Transylvanian pedagogy and encyclopaedism.

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