

BOOKS ABOUT KARST AND SUBTERRANEAN IN AUERSPERG'S »PRINCE'S« LIBRARY OF LJUBLJANA

KNJIGE O KRASU IN PODZEMLJU V TURJAŠKI »KNEŽJI« KNJIŽNICI V LJUBLJANI

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Abstract

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Stanislav Južnič: Books about karst and subterranean in Auersperg's »prince's« library of Ljubljana

For the first time the karst research books at the former Ljubljanian Auersperg "Prince's" library were put at the limelight by using the recently found manuscript catalogue 1668 (transcribed in 1762) and sales catalogues of 1982 and 1983. During the baroque times of Volf Engelbert Auersperg the science of karst was not born yet. The researchers had to wait for another century until the most fundamental facts about karst were proved by Carniolan scientists Hacquet, Gruber, and others. Nonetheless Volf collected several important books about karst with famous authors Aldrovandi, Ferrante Imperato, Johann Joachim Becher, Tommaso Buoni, Jakob Joannes Wenceslaus Dobrzensky de Nigro Ponte, and Athanasius Kircher. The special concern was put on the Count Volf Engelbert and his brother Prince Janez Vajkard interests in karst phenomena and their mutual influence on the younger visitors of their Ljubljanian palace, especially Schönleben and Valvasor. Volf and Janez owned several manors at now Slovenian and Croatian karst. Janez Vajkard personally managed the first systematic research of subterranean animals in Postojna cave as a part of his Postojna Manor.

Key words: Auerspergs, karst, karst literature, Baroque, Ljubljana, Slovenia.

Izvleček

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Stanislav Južnič: Knjige o krasu in podzemlju v turjaški »knežji« knjižnici

Opisane so knjige o krasu iz nekdanje ljubljanske turjaške knežje knjižnice. Pri njihovem iskanju smo si pomagali z rokopisnim katalogom iz leta 1668, prepisanim leta 1762 ter s prodajnimi katalogi iz let 1982 in 1983. Grof Volf Engelbert je v knjižnici zbral več zanimivih in pomembnih raziskav o krasu, ki so jih spisali Aldrovandi, Ferrante Imperato, Johann Joachim Becher, Tommaso Buoni, Jakob Joannes Wenceslaus Dobrzensky de Nigro Ponte in Athanasius Kircher. Podane so primerjave z Valvasorjevo in drugimi kranjskim knjižnicami 17. stoletja. Posebej so izpostavljena znanstvena nagnjenja in usmeritve prvih lastnikov knjig, predvsem turjaškega grofa Volfa Engelberta in njegovega brata kneza Janeza Vajkarda. Podrobno je raziskan pomen njunega zanimanja za kras in vpliv na mlajše obiskovalce njune palače, med njimi predvsem Schönleben in Valvasorja. Knjižnica služi kot osnova za razmišljanje o poznavanju krasa pri Turjačanih, ki so imeli več graščin na krasu. Lastnik postojnskega gradu knez Janez Vajkard je lastnoročno vodil prva raziskovanja podzemnega živalstva.

Ključne besede: Turjačani, kras, literatura o krasu, barok, Ljubljana, Slovenija.

INTRODUCTION

The library of the Count Volf Engelbert Auersperg was among the best private collections. He and his younger European baroque brother Prince Janez Vajkard Auersperg collected 7000 titles of the carefully selected predominantly baroque literature. There was no monograph devoted solely to the karst in their times, but Volf and his

brother's books contained several important researches of the karst and subterranean phenomena. Volf's first librarian and also his best personal friend Janez Ludvik Schönleben (* 1618 Ljubljana; † 1681) classified the books into eighteen classes. The description of classes didn't mention any karst phenomena. As a geological and biologi-

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cal oriented research, the karst would fit in to the sixth class of medicine, but only Imperato's karst research was listed among the medicine books. Aldrovandi's zoology books were noted as a profane history. Kircher and Dobrzensky's books were put at the mathematical class, and Travagini's work was added to the philosophical books because the baroque philosophy still included physics.

Schönleben himself was one of the best baroque karst researchers. His book included the description of Cerknica Lake and Carniolan Caves (1681). It was eventually published eight years after Volf's death, to late to be mentioned at Volf's library catalogue (HHStA, FAA). But at least ten other Schönleben writings were catalogued and Schönleben certainly used Volf's library for his karst research.

ULYSSE ALDROVANDI

(Ullisse, * 1522 Bologna; † 1605 Bologna)

Aldrovandi was the director of Botanical Garden, professor of logic and medicine at the University of Bologna. He developed the first well off Natural History Museum, although the Botanical Gardens at Padua and Pisa were established somewhat earlier (Lines 2006, 132, 140).

Aldrovandi was the most influential zoologist of his time with special interest at the subterranean (Shaw

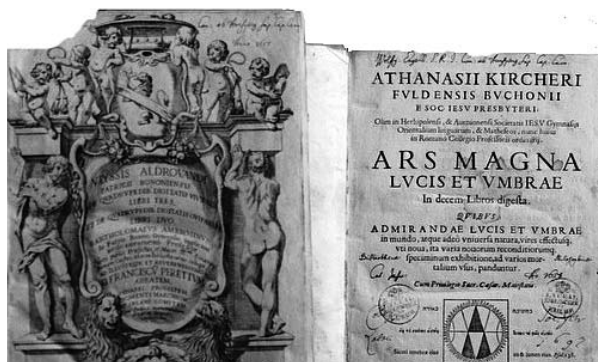


Fig. 1: Schönleben's handwriting of Volf's bookplate at the title page of Aldrovandi's description of the quadrupeds with toes, one of the five Aldrovandi's description of animals now kept at the National and University Library of Ljubljana (Aldrovandi 1637). On the right side is Kircher's optics with Schönleben's handwriting of Volf's exlibris above the later Ljublijanian Jesuit bookplate (Kircher 1646).

Sl. 1: Schönlebnov vpis turjaškega ekslibrisa na naslovnici Aldrovandijevega opisa štirinožcev s prsti. Eden od petih Aldrovandijevih opisov živalstva iz zbirke Volfa Engelberta Turjaškega v današnjem NUKu na prostorih nekdanje turjaške knežje knjižnice (Aldrovandi 1637). Na desni je Schönlebnov vpis turjaškega ekslibrisa na naslovnici Kircherjeve Svetlobe in sence s prepisom na ljubljanske jezuite 39 let pozneje (Kircher 1646).

Publication	Title and Place of Publication	HHStA, FAA page, class
1599, 1602, 1603	Orinthologia sive hist. De avibus, tom 1-3. Bologna	265, Profane History
1602	De insecti.	266, Profane History
1616, 1631, 1621	De quadrupedibus.	266, Profane History
1606	Animalibus exanquibus.	266, Profane History
1613	De piscibus et cetis. Bologna	266, Profane History
1640	De serpentis et dragonis. Bologna	266, Profane History
1599	De monstribus & paralipomeni. Bologna	266, Profane History
	11 books	416, added 1761

Table 1: Aldrovandi's books in Auersperg's "Prince's" library

2001, 286). Volf bought many Aldrovandi's books, and his brother's descendants added eleven more according to the catalogue listing of February 5, 1761 (HHStA, FAA, 416). Just five of those books are now kept at the National and University Library of Ljubljana. All five were published after Aldrovandi's death. By mere chance the building of National and University Library stands almost at the same place once occupied by Auersperg "Prince's" palace with a library.

FERRANTE IMPERATO

(* 1550 Naples; † 1625 Naples)

Volf bought several Academy dei Lincei and its member Galileo's books. Several Volf's authors were the Academy dei Lincei members from Naples. Volf didn't buy G.B. Stelluti's review of very influential Porta's *De Humana Physiognomia* (1586) or Stelluti's book about honeycomb (1625). Nonetheless Volf bought three Porta's books and one of Porta's fellow Naples citizen Imperato. The Karst researcher Imperato was also a member of Academy dei Lincei.



Fig. 2: The older illuminated handwriting as a cover of Aldrovandi's description of quadrupeds with toes (Aldrovandi 1637).

Sl. 2: Starejši okrašeni rokopis na platnici Aldrovandijevega opisa štirinožcev s prsti (Aldrovandi 1637).

item. Ferrante published 640 pictures showing all three Natural History kingdoms beginning with the crystals, fossils of plants, fossils of animals, corals, and fungus (Imperato 1599, 643-734). The real nature of fungus was certainly not widely known in his times. On next pages Imperato described the plants (Imperato 1599, 756-777) and finally animals beginning with cuttlefishes and fishes (Imperato 1599, 778). The perfectly documented book full of lively observations simply had to attract a collector like Volf. Even in the later edition published shortly before Volf's death the editors included again a copperplate with Ferrante's Natural History cabinet during the demonstration.

At the year of Volf's birth (1610) Ferrante's son Francesco Imperato published a book about minerals (Thorndike 1958, 7, 247) showing that an apple doesn't fall far from a tree. He inherited at last some of his father abilities.

Besides Ferrante's description of the subterranean waters Volf also got Kircher's early description of Cerknica Lake and Volf was therefore certainly one of our early admirers of the Karst phenomena. Ferrante's book was especially useful for the Prince Janez Vajkard, because he happened to be the very first systematic researcher of the subterranean world of Postojna Cave which was a part of his manor Postojna.

Janez bought Pazin (June 18, 1665) and together with his brother Volf also Belaj and Paz (1666). Nearby Kršan was also Janez' property at now Croatian Istria and he incorporated Paz and Kršan into Pazin County.

After his political downfall the recently widowed Prince Janez Vajkard with his seven children went to his County Wels and somewhat later emperor eventually permitted Janez' return to his native Carniola. To forget the reversal of his fortune Janez amused himself with



Fig. 3: The title page of Imperato's Natural History (Imperato, 1599).

Sl. 3: Naslovna stran Imperatovega Naravoslovja (Imperato, 1599).



Fig. 4: The handy-colored two page copperplate of Imperato's museum in Naples with a rich library and different natural history curiosities during the demonstration for visitors (Imperato 1599).

Sl. 4: Ročno barvan dvostranski bakrorez Imperatovega muzeja v Neaplju z bogato knjižnico in raznovrstnimi naravoslovnimi znamenitostmi med demonstracijo obiskovalcem (Imperato 1599).

hunting and scientific studies of the Karst. Few months before his December 1669 political debacle he bought the Karst Inner Carniola manors of Snežnik and Lož from the Prince Janez Anton Eggenberg on July 3, 1669. Janez also took the possession of Postojna manor with the famous cave included.

The prince Janez Vajkard certainly knew a lot about Postojna Cave even before he bought it. Philippus Cluverius (Cluverij, * 1580 Danzig; † 1622) described Postojna Cave in his posthumous work as »a big Cave with rustling river at the hollow hill near Ljubljana«. That and other Cluverius' works were well known in Carniola because they were selling as much as five Cluverius' books in Ljubljana just after Janez' death (Mayr 1678, 71–72). Humanist Cluverius became famous with his geographical research of the Antique and Near East. After the long travels through Germany, Italy, France, and England he lectured at the University of Leyden. Shortly after Cluverius' death Otto Guericke studied in Leyden. Three decades later Guericke collaborated with the Prince Janez Vajkard Auersperg on vacuum experiments and they probably exchanged their opinions of the vacuum role at Cluverius' like hollow hills and siphons under Javornik which occupied later Valvasor's Cerknica lake description.

The Postojna Cave was already widely visited at those baroque times and subterranean flow of the Pivka River was researched »at a distance of a whole mile«. Therefore curious Prince Janez Vajkard »of gentle memory« undertook his own research as a new lord of the manor Postojna. Soon after Volf's death Janez hired one of his bondmen for the subterranean river research under the one foot thick Postojna Cave natural bridge. The bondman was inured fisherman carrying with him a fishing net because his thrifty master Janez wanted to prove the surmises about the subterranean animals he had read about at Imperato's and other books from Volf's collection which he recently inherited. The collaborators tied the bondman to the rope and let him slip slowly by the cliff until he reached the water level. His helpers and fellow bondmen at the open chattered a little bit too much and did not hurry enough to return a poor researcher to the open air again. They were certainly quite amused when he after all joined them at the bridge carrying at his net a luce, carp, and bleak. Those fishes were not especially thick, but, sorry to say, pretty skinny. But they looked like ordinary ones and that was the information the Prince was searching for.

The prince Janez Vajkard was very satisfied anyway and wished to repeat the experiment. Therefore he offered the same bondman a whole crown for his efforts again. But obstinate farmer did not want to go to the cave depth once more even if the Prince offered him a whole manor of Postojna. He also refused to share any useful information: "I would not tell what I saw or hear at the depth; and I would even not confess why I don't want to descend again!" He was so persuasive that the Prince was unable to force him nor with a word nor with a sword. Even worse: the Prince had to abandon the further research because certainly there were no more volunteers.

Everybody believed that there was something timid waiting just for him at the deep bottom. At that way one of the very first modern systematic Carniolan experiments came to its ill-humoured end. In 1679, a year and a half after Prince Janez Vajkard Auersperg's death, Janez Vajkard Valvasor found the aged cave-fisherman and tried to gain some information about his famous descent into the cave (Reisp 1983, 144). But even this time the bondsman did not want to tell any practicable details about his subterranean research, certainly among the first planned ones in this part of the world. From his behavior Valvasor concluded that the bondsman obviously met some kind of monster at the dark cave which scarred him to his guts.

At that way or another Prince Janez Vajkard Auersperg proved Imperato's hypotheses even if Janez never published his own research in print. He lived in different time and social conditions when the high nobility was quite satisfied to share their knowledge at oral or manuscript form leaving the publications to the people of lower classes. Even without the publications of his own the Prince Janez Vajkard was the most influential promoter of the early new scientific ideas at Central Europe. In 1654 he became a patron of the very first German translation of the English pioneer of the new way of experimenting Francis Bacon Lord Verulam.

ATHANASIUS KIRCHER

(* 1601 Geisa; † 1680 Rome)

Volf was certainly an admirer of Tommaso Buoni's work and therefore bought two Buoni's books about the cosmography. At the first volume a member of the Roman Academy Buoni wrote about the angels, subterranean worlds, beauty, circumstances on Heaven and Earth, virtues, light, and animals. His treatise on the subterranean worlds was therefore almost the only scientific part of the book. At the second part he discussed the human virtues. He also wrote many librettos and is considered to be the author of some funny stories of the invented »*Compagnia della lesina*« which were republished several times during the 17th century.

Buoni's native Lucca attracted the Jesuit Kircher strong enough to write a book about it. Among the many books Kircher wrote just the one about Lucca remained unpublished because of too many errors even for Kircher's publishers. Valvasor owned almost all Kircher books, but Valvasor's paragon Volf also had many of them. In fact, Volf collected more than a half of all Kircher publications. Several of them discussed the Karst and subterranean phenomena. In 1658 Volf's librarian Schönleben wrote Volf's exlibris into Kircher's *Iter Extaticum II* also known as *Structura globis terrestris*. Kircher discussed there the very first useful description of the changing level of the Cerknica Lake, published eight years before

the famous Kircher's *Mundus subterraneus* which Volf certainly also had. It's a pity that Kircher did not see our Cerknica Lake with his own eyes but used the descriptions and letters of other visitors. Kircher also wrote about the interior of Earth, volcano, winds, and waters. He explained the structure of the Earth, fossils, minerals, and oceans. Among the first Kircher published the list of earthquakes and tried to find their causes. Volf's interest in earthquakes is also seen in his acquisition of Travagini's book and Kircher's *Diatriba* (1661) in which Schönleben wrote »ex dono Authoris« in 1663. »Ex dono Authoris« certainly did not mean that Kircher himself visited Volf in Ljubljana.

In *Diatriba* Kircher described many unusual objects at the sky just before the eruption of Vesuvius between August 16, 1660 and October 15, 1660. Kircher described similar events that took place in the years 363, 419, 958, and 1550. By the books Kircher personally donated to Volf we can judge that their mutual personal connections lasted at least between the years 1658 and 1663. During that time Kircher gave at least three books to Volf

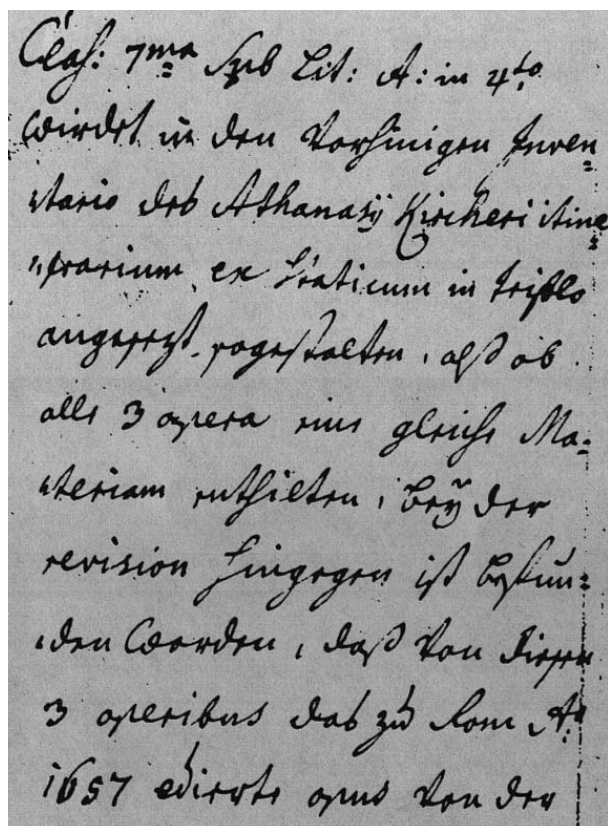


Fig. 5: Long description of Kircher's *Iter extaticum II* (1657) at the catalogue of Volf's books in 1668 according to the copy made in 1762 (HHStA FAA, 327).

Sl. 5: Daljši zapis o Kircherjevem *Iter extaticum II* (1657) v katalogu Volfovih knjig iz leta 1668 po prepisu iz leta 1762 (HHStA FAA, 327).

and certainly judged that kind of gift as a good business stroke which would help his books to sell better because of Volf's reputation and high official post.

FRANCISCO TRAVAGINI

(Travagino, Travaginus, * 1613 Dubrovnik; † after 1688 Venice)

The Venice physician and merchant Travagini described the Dubrovnik (April 6, 1667) earthquake two years after the tragedy. He dedicated his work to the otherwise unknown Venetian Habert Mammor in April 1669 (Travagini 1669, unpagged dedication IV, 19). At the title Travagini even separately stated the importance of the Copernicus »invention« of the daily rotation of Earth which proved to be very important for the Travagini's theory of earthquakes. Travagini stated that the daily rotation of Earth causes the pressures in unsteady subterranean.

Travagini was pretty popular at Ljubljana and besides Volf's acquisition Mayr also offered Travagini's book to Ljubljanians in 1678. Volf's exemplar of Travagini's book was bound with the older Bernegger's Latin translation of the very first Galileo's published work about the use of geometric and military "compass" (1612). The instrument later became an ancestor of the logarithmic and mechanical computing tools.

In 1679 Petreus summarized Travagini's works about the medicine and Dubrovnik earthquake, but Volf didn't buy Petreus' work. Travagini's book (1669) has Volf's bookplate: »Exlibris... Wolfgangi Engelberti S:R:J: Comitis ab Auersperge Ducatus Carniolae Capitanei Catalogo inscriptus«. The book has the supposed Radics's bookplate at the inner side of the front cover with a coat of arms and heading »Fuerstlich Auerspergische Fideicommissionbibliothek zu Laybach«. The geographer and publicist Peter Pavel von Radics from Postojna was the last Auersperg's Ljubljanian Librarian.

The bounding of Travagini's book with the Galileo's one was not mentioned at the catalogue of 1668/1762, but it's stated at the selling catalogue (HHStA FAA; Sotheby's 1982, 46). Probably they were not bound together before 1762.

Travagini became famous with his geometrical model of the traveling waves of lateral side vibrations between the epicenter of the earthquake and the point at the surface or between one and another point at the surface. He described the spreading of Dubrovnik earthquake from the South Adriatic to Venice and Naples (Travagini 1669, 11). Travagini considerably influenced later Robert Mallet's (* 3. 6. 1810 Dublin; † 1881) theory and as the very first described the waves without long-distance moving of the Earth mass. He verified his theory at the waves of Venice canals during the Dubrovnik earthquake. Near the canals he offered jet another useful illustration

Volf's <i>exlibris</i>	Publication	Title and Place of Publication	HHStA, FAA page, library class; number in Sotheby's catalogue
1655	1641	<i>Artis Magnetica</i> . Rome	327, Mathematics; 209
1658	1646	<i>Ars Magna lucis</i> . Rome	-; -
	1650	<i>Musurgia Universalis</i> . 1-2, Rome	397, Music; 211, 2: 314
	1650	<i>Musurgia Universalis</i> . 1 st part, Rome	397, Music; 212
	1650	<i>Musurgia Universalis</i> . 2 nd part, Rome	397, Music; 212
	1652, 1654	<i>Oedipus Aegyptiacus</i> . Rome	
1658	1656	<i>Itinerarium</i> . Rome (Donum Authoris)	329, Mathematics; 204
	1656	<i>Structura globis Coelestis (Iter Extaticum I)</i> . Rome (duple)	327, Mathematics; 204, 205
1658	1657	<i>Structura globis terrestris (Iter Extaticum II)</i> . Rome	327, Mathematics; 206, 207
	1658	<i>Scrutinum physico medicum</i> . Rome	315 Medicine; 218
1663	1661	<i>Diatribes di prodigiosis</i> . Rome (Donum Authoris)	233, Church History; 203
	1663	<i>Polygraphia</i> . Rome (Donum Authoris)	-; 217
	1667	<i>Historia Chinensis</i> . Amsterdam	244, Profane History; 202
	1667	<i>Regnum natura magneticum</i> . Rome	337 Philosophy; 210
	1669	<i>Ars Magna sciendi seu combinatorica</i> . Amsterdam	369, Linguistic; 201
	1671	<i>Descriptio Latium veteris et nova</i> . Amsterdam	244, Profane History; 208

Table 2: Kircher's books in Volf's library

of the oscillation with a vertically oriented beats of the hammer at the surface of Earth, which causes side waves (Travagini 1669, 17). At that way he joined the Venetian lagoon experience with a domestic smithy to present his own ideas to the reader as clear as possible. He compared the earthquake waves with the water waves and also with the pendulum oscillations (Travagini 1669, 26).

Travagini found that the same earthquake causes three different mixtures of the sequenced moves and side or inclined vibrations. At some distances from the source of the motion the sequence of beats could be stronger than the side vibrations. The succession of motions has a limited reach but the side vibrations could transverse a long distance. That enabled the vibrations of the Dubrovnik area earthquake to travel as far as Venice, where Travagini observed motion of the church chandeliers and the water fluctuations at canals.

Travagini imagined the Earth interior composed of sulfur, nitrogen, and water to make the spreading of the waves possible. At the same time he believed at the exhalations of fire and fragrances that were supposed to spread from the Dubrovnik epicenter to the other places (Travagini 1669, 9).

On December 22, 1666 Travagini of Dubrovnik began to mail letters to the secretary of the London Royal Society Oldenburg. Montagu brought the first Travagini's letter to London on April 2, 1667 together with the Tra-

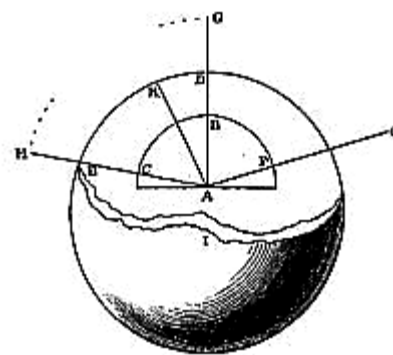


Fig. 6: Travagini's model of the Earth used to describe the spreading of earthquake oscillations.

Sl. 6: Travaginijev model Zemlje za širjenje potresnih nihanj.

vagini's message for the recently passed Kenelm Digby. Oldenburg answered from London to Venice on May 15, 1667. He praised Travagini's enthusiasm for experiments and offered him his own *Philosophical Transactions* of the London Royal Society asking Travagini to help him at the sales in Italy (Oldenburg 1966, 3, 303). Mayr offered the same Oldenburg's *Philosophical Transactions* to his Ljubljanian customers a decade before Travagini's death.

Oldenburg certainly made some money with Philosophical Transactions sales.

Oldenburg highly praised Travagini's experimental philosophy, and on May 1, 1668 Travagini reported about the research of Riccioli, Kircher and others in Italy (Boas Hall 2002, 86; Oldenburg 1967, 4, 328). At the same time Travagini exchanged the letters with Marcello Malpighi about medicine. With the Secretary Oldenburg's support Travagini became a Fellow of the London Royal Society on February 10, 1676 (Oldenburg 1986, 12, 6). A decade later (December 14, 1687) Valvasor was elected too. Oldenburg knew Travagini's *Synopseos Novae* about the acids and alkalis (Thorndike 8, 216). Oldenburg kept Travagini's research of the Dubrovnik earthquake at his library. As a Venice physician Travagini also occupied himself with profitable trade. He was even supposed to accomplish two successful transmutations of the quicksilver to pure silver with a help of herbal extracts. But he was unsuccessful at other fifty experiments of that kind. In October 1675 Boyle examined the silver acquired at Travagini's way and mailed to Oldenburg, but Boyle's opinion was the not quite favorable (Oldenburg 1971, 8, 62; Oldenburg 1977, 11, 231, 292, 355-356).

JAKOB JOANNES WENCESLAUS DOBRZENSKY
DE NIGRO PONTE

(Jakub Jan Vaclav (Wenčeslav) iz Černeho Mostu
(Schwartzbrug), * 1623; † 1697).

Volf certainly followed the alchemistic quarrels between his three years older fellow Carniolan Janez Friderik Rain (* 1613 Strmol; † after 1686) and Dobrzensky. Therefore Volf bought the book about hydro technique which Dobrzensky published already during his studies at Ferrara, after he spent some time as a classmate of Volf's friend and first librarian Schönleben at Padua. It's hard to decide which side Volf supported during the quarrel as he certainly knew both protagonists in person.

Dobrzensky was a descendant of the famous Prague physician family, but his own father was an administrator at the salt storehouse. Dobrzensky studied at the Italian universities of Padua, Ferrara, Bologna, and Modena as many Carniolans did at the same time. Only Kircher's friend Marcus Marci was able to arrange Dobrzensky's return back to Prague where he finished his studies in 1663. Dobrzensky worked for some time at Karlovi Vari and began to lecture at the University of Prague only in 1664. At the year of Marci's death Dobrzensky became an assistant professor. In 1682 he was promoted to the ordinary professorship and next year he got a chair for practical medicine (Svobodný 1998, 79; Štoll 1998, 132; Minařík 2000, 351). At the years 1670 and 1685 Dobrzensky was a rector of the Prague University (Šolcová 1998,

194). He exchanged the letters with Kircher and most of all admired Marcus Marci (Lienkauf 1993, 62; Marek 1968, 130).

Dobrzensky cited Riccioli, Copernicus, and Galileo's opinions about the influence of Earth rotation on the fountains. He even found useful Helmont's hypotheses that there is thousand times more water in the subterranean than in all oceans put together. Dobrzensky tried to prove that quicksilver contained water which filled the supposed vacuum during Torricelli's experiment. He went even further and claimed that his own friend Kircher was the real inventor of barometer (Thorndike 1958, 7, 584-585, 8, 202-203).

JOHANN JOACHIM BECHER

(* 1635 Speyer; † 1682 London)

Becher was for a while the most influential Viennese authority on the natural history and economy. Volf bought three Becher's works, and Mayr in 1678 offered another three, among them two Becher's *Physics of Subterranean* (1669). Primary Mayr listed a second part of Becher's title *Physica Subterranea Libri duo*, and on the second occasion the first part of the title *Actorum Laboratorii Chymici Monacensis*. At that book Becher published the iatrochemical research at the style of Paracelsus or Helmont. In fact Becher refused Paracelsus' school with sulfur as the principle of all inflammable mater including metals. Becher preferred *terra pinguis* which Stahl half of a century later rechristened to the phlogiston (Pavšek-Baždar 1994, 12). Four years after Kircher's *Mundi Subterranei* (1657) Becher tried to describe subterranean worlds on his own terms in *Actorum Laboratorii Chymici Monacensis* (Thorndike 1958, 7, 578).

As the personal tutor of Robert Boyle's nephew Jones during his European "grand tour" Oldenburg paid a visit to the still young but already famous Mainz physician Becher in 1658 (Boas Hall 2002, 34, 36). In 1666 Becher became a lecturer of medicine in Mainz and the personal physician of Archbishop and Prince-Elector Johann Philipp von Schönborn (* 1605; † 1673). At that function he met the Jesuit Gaspar Schott from the nearby Würzburg, who was Kircher's best student. Schott dedicated his book (1664) to Schönbörn and Volf certainly did not hesitate to acquire the item.

In 1666 Becher also became the commercial adviser at Vienna and that high position certainly helped to popularize his works at our lands. After the political downfall of the Prime minister Prince Janez Volfgang Auersperg in December 1669 Becher enjoyed the political support of Count Albrecht Zinzendorf (* 1619; † 1683), the son of the Johann Joachim von Zinzendorf (* 1570; † 1626). The Count Albrecht Zinzendorf became a new prime minister of the emperor Leopold I and the member of the secret

council (Sienell 2001, 173). The Emperor sent Becher to Holland where Becher adopted the mercantilism ideas. Stahl later used Becher's theories to develop the doctrine of the phlogiston which influenced all research of heat phenomena until Lavoisier. In 1668 with reprint six years later Becher published his didactic studies (Lind 1992, 369) and Volf hurried to get as much as three exemplars of that masterpiece. In January 1680 Becher described his accurate clock to the Royal Society of London. Becher even tried to take over Galileo and Huygens' priority claiming that he himself used the very first pendulum for the time measurements. Ljubljanians bought Becher's

London work on clocks bound with the older Boyle's experiments, Sturm's Altdorf letter about the hydrostatics of air mailed to Henry Moore, Peter Mousenk's edition of Joannis Danielis, Joannes Alfonz Borelli and Lyon issue of Fabri's book about the physics of the local motion (1646). Besides the inventor of the telescope Cornelius Drebbel Becher mentioned many discoveries of the Jesuits Riccioli, Kircher, Schott, and Sturm. At the end Becher made some propaganda for his publications and listed them sorted by the field of research (Becher 1680, 3, 15, 17, 22).

CONCLUSION

Volf's library was among the best of his time. He and his brother Janez were personally interested in the karst phenomena as the patriotic Carniolian nobles. Janez even organized some first rate research at Postojna Cave.

The enviable education of Carniolan high nobility and their interest in the local Carniolan curiosity was the

base for Valvasor and even later Hacquet and Gruber's work. With a close look at Volf's rich library the success of continuators of his endeavours wasn't any real surprise.

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KNJIGE O KRASU V TURJAŠKI »KNEŽJI« KNJIŽNICI V LJUBLJANI

POVZETEK

Opisane so knjige o krasu iz nekdanje ljubljanske turjaške knežje knjižnice. Pri njihovem iskanju smo si pomagali z rokopisnim katalogom iz leta 1662 prepisanem leta 1762 in s prodajnimi katalogi iz let 1982-1983.

Posebej so izpostavljena znanstvena nagnjenja in usmeritve prvih lastnikov knjig, predvsem turjaškega grofa Volfa Engelberta in njegovega brata kneza Janeza Vajkarda. Podrobno je raziskan pomen nekaterih njunih nabav. Knjižnica služi kot osnova za razmišljanje o poznavanju krasa pri Turjačanih, ki so bili lastniki več graščin na krasu, med drugim postojnskega gradu. Podane so primerjave z drugimi knjižnicami 17. stoletja v cesarstvu in drugod po Evropi.

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