

ANTONÍN STRNAD (1746–1799) – THE FIRST PROFESSOR OF PHYSICAL GEOGRAPHY AT CHARLES UNIVERSITY IN PRAGUE

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ABSTRACT

The paper is concerned with the life of Antonín Strnad (1746–1799), who became the outstanding representative of mathematics, astronomy and physical geography at the Artistic Faculty of Charles University in Prague. Main professional activities, methodological approaches and research results of professor Antonín Strnad are emphasized, namely in relation to physical geography.

Key words: Antonín Strnad, physical geography, mathematics, astronomy, Charles University in Prague

1. Introduction

The 2nd half of the 18th century was one of the significant periods of progress in natural sciences at Charles University in Prague. Antonín Strnad (1746–1799) became the outstanding representative of mathematics, astronomy and physical geography at the Artistic Faculty. The presented study is concerned with the life of Antonín Strnad, his main professional activities, methodological approaches and research results, namely in relation to physical geography.

At the Faculty of Science of Charles University in Prague was realized in the year 2006 the conference at honour of 150 years of the significant event in history of the university. In 1856, Jan Kašpar Palacký (1830–1908), lecturing and going in for regional and physical geography, habilitated as docent (reader) of geography at the Faculty of Arts of this university. His habilitation thesis dealt with the morphographic patterns of central Africa. The extraordinary professor of geography at Prague University was Dionys Wilhelm Grün (1819–1896) who was promoted in 1872 and became a full professor in 1876. Jan Kašpar Palacký was later appointed extraordinary professor in 1885 and full professor of geography in 1891 (Horák 1954; Häufler 1967). The geographical sections of J. K. Palacký and D. W. Grün at the Department of Philosophy of Charles University were foundation stones for the progressively developing Geographical Institute (compare Jeleček et al. 2006).

However, geography oriented lectures and publications existed at Charles University long before the habilitation of the geographer J. K. Palacký in 1856. After the foundation of this university by Charles IV in 1348, the fundamentals of mathematical geography were included into the philosophically and theologically conceived lectures of Stanislav of Znojmo and Křišťan of Prachatice in the second half of the 14th and in the

15th centuries. For example, English-Czech contacts grew sensibly stronger after the foundation of Charles University in Prague (Goudie, Kalvoda 2007). It was at the time when the Czech princess, Anne of Luxemburg (1366–1394), became the Queen of England.

A fervent Czech explorer, who already in the first century of existence of Charles University used his extensive geographical experience from the whole of Europe (and Palestine) in his theological sermons and works, was the eminent philosopher and Church reformer Jerome of Prague (Hieronymus Pragensis, 1378–1416). It was exactly the master and later professor of the Faculty of Liberal Arts (or Artistic Faculty) of Prague University, Jerome of Prague, who brought to Prague from his studies at Oxford University copies of the reformatory works of the English theologian and Oxford professor John Wycliffe (1320–1384). Jerome of Prague was a follower of the theological teaching of the master Jan Hus and likewise was burnt at the stake after the Council of Constance.

Geographical findings of the 15th and the 16th century were taught at Charles University within astronomical, philosophical and historical lectures for instance by Jan Ondřej Šindel (1375–1456), Vavřinec of Březová (1370–1437), Jan Zahrádka of Prague (1501–1557), Daniel Adam of Veleslavín (1545–1599) and Tadeáš Hájek of Hájek (1525–1600). Doctor, astronomer, botanist and also geographer Tadeáš Hájek of Hájek was undoubtedly the most eminent Czech natural scientist of the 16th century (Horák 1954). He also promoted works by Nicolaus Copernicus, especially his important heliocentric work *De revolutionibus orbium coelestium* (1543). It is said that Tadeáš Hájek of Hájek arranged, as personal doctor of the Emperor Rudolf II, the invitation to Prague for the Danish astronomer Tycho de Brahe and for the German astronomer Johannes Kepler.

At the beginning of the 17th century, geography was included in the lectures of Martin Bacháček of

Nauměřice (1539–1612). In 1724, the professor of philosophy and theology of Prague University Honorius Martin Czechura (1688–1726) published an extensive work including also parts dedicated to physical geography. An astronomical observatory was established in 1752 at the Jesuit Faculty of Philosophy at Charles University, where uninterrupted meteorological measurements have been done since 1771. These observations were initiated by Professor Josef Stepling (1716–1778) and continued by Professor Antonín Strnad (1746–1799). The latter was, after the general reforms by Emperor Maria Theresia, appointed professor of mathematics and physical geography in 1778.

After another reform by the Emperor Josef II (1784), natural science and physical geography became regular auxiliary subjects taught at the Faculty of Philosophy (Häufler 1967; Munzar 1996). At that time, mathematical geography and cartography were lectured at Prague University as parts of mathematics and astronomy. These reforms and Czech endeavours towards national revival in the first half of the 19th century set the basis for historical changes in geography studies at Charles University in particular and in the Czech countries in general, which were carried through by the generation of natural scientists at the time of Jan Kašpar Palacký.

2. A brief curriculum vitae of Antonín Strnad

Antonín Strnad was born on 10th August 1746 in Náchod (eastern Bohemia) and acquired an extensive education as a student of the Jesuit Order in Brno, Uherské Hradiště and Olomouc (Schuster 1931; Šolcová 1999; Vlčková 1999). He worked in Prague from 1771, firstly as an assistant of Joseph Stepling (1716–1778), who was the founder of the astronomical and meteorological observatory in the Clementinum College (1751, Figure 1). Antonín Strnad (written also as Anton Strnad or Sternat in manuscripts published in German or Latine language) was nominated director of the Clementinum observatory in 1781, worked as administrator of the Mathematical museum (1774–1785) and director of the Royal Czech Society of Science (1787–1788). In the year 1784, Antonín Strnad was also nominated as a member of the Meteorological Scientific Society in Mannheim. He was appointed as professor of mathematics and physical geography (1778), dean of the Artistic Faculty (1792) and the chancellor of Charles-Ferdinand University (1795). Antonín Strnad initiated a rescue and general repair of the Prague Astronomical Clock (1781), and was very famous for his scientific library, research and practical papers as well as excellent professional lectures and popular talks. Profes-



Fig. 1 Clementinum astronomic tower in the 1930's. Source: Archives of the National Library of the Czech Republic

sor Antonín Strnad died, after a severe disease, on the autumn equinox day, the 23th September 1799, at Sazená castle. He was buried in the cemetery of parish church of St. Climent in Chržín near Velvary in central Bohemia.

3. Orientation, style and scope of Antonín Strnad's professional activities

Professor Antonín Strnad tirelessly developed all major aspects of professional work that are essential also for contemporary science and university teaching. First, he systematically collected and studied written materials as valuable sources of data on natural environment as well as on efforts to preserve cultural values. He also tried to gather primary data on natural environment in view to analyse them correctly and to interpret them in line of laws of nature. He systematically published partial results of his work and transmitted them to his university students. A characteristic feature of Antonín Strnad's extensive professional work was his sharp sense for using research results for the profit of the society (Novotná, Kalvoda 2012).

The exact approach of Antonín Strnad to research and pedagogical work resulted both from his extraordinary talent and assiduity as well as from his systematic and universal education during his long studies. Antonín Strnad studied at grammar school in Hradec Králové thanks to financial backing from his uncle Jan Strnad, dean in Náchod and canon of Hradec Králové Chapter. On 21st of October 1763, Antonín Strnad jointed the Jesuit novitiate in Brno, where he studied up to 1765. He learned rhetoric, spoke both Czech and German, played musical instruments and was in a good physical condition. Then he left for scholastic studies to Uherské Hradiště (1766), where he followed courses in literature, languages and antique scientific disciplines. In 1767–1768, he studied philosophy and mathematics at the Jesuit College in Olomouc. In 1769, he was selected to the Klementinum College in Prague to be able to perfect his knowledge in mathematics and theology. Antonín Strnad spent his last two years in the Jesuit order (1771–1773) at the Klementinum College working as assistant of the prefect of astronomy, Father Josef Stepling (1716–1778). He ought to take holy orders and definitively join the Jesuit order. In 1773, however, the order was suppressed by a bull of Pope Clement XIV and its possessions passed to the hands of the Habsburg monarchy (Richterová, Čornejová 2006).

Since 1774, Antonín Strnad worked as assistant at Klementinum Observatory (at that time known as Prague Royal Observatory) and in 1781 became its director with the title of Astronomer Royal (Pejml 1975). The geographic position of this observatory was specified by Antonín Strnad in his studies *Astronomische Beobachtung des oberen Sonnenrandes und daraus gezogene Polhöhe der hiesigen Sternwarte* (1777) and *Berichtigung der geographische Länge der Stadt Prag* (1786). During his regular

meteorological observations, Antonín Strnad measured several times a day temperature, air pressure and humidity as well as magnetic declination. Thanks to Antonín Strnad, meteorological stations were established also outside Prague, the most important of them being Žitenice near Litoměřice, Telč and Teplá Monastery near Mariánské Lázně.

The professional library of Josef Stepling was, after the death of this leading astronomer in 1778, bequeathed to the University Library. Antonín Strnad progressively constituted a new collection, the major part of which is now deposited in the Premonstratensian Library at Strahov (Seydl 1939), some prints are in the library of the Astronomical Institute of the Academy of Sciences of the Czech Republic and other ones in different castle libraries. Antonín Strnad was also in charge of collections in the so-called Klementinum Mathematics Hall. In 1774–1785, he was custodian of the Mathematical Museum founded as the first public museum in the Czech lands as soon as in 1722.

After the death of his teacher Josef Stepling, Antonín Strnad, as his successor, was appointed as extraordinary professor of mathematics and physical geography at Prague University. Up to 1797, he gave lectures on practical astronomy and physical geography at the Faculty of Arts. Besides regular lectures, Antonín Strnad organized on Thursdays “colleges” on mathematical geography, meteorology and knowledge of heavens. In 1792, Antonín Strnad was appointed as dean of the Faculty of Arts and in 1795 as rector of the Charles-Ferdinand University (Čornejová 1995; Šolcová 1999).

Since 1781, Antonín Strnad collaborated with several European meteorological societies, for example with those of Mannheim, Berlin, Vienna and Leipzig. In Mannheim, he contributed to *Ephemerides Societatis meteorological Palatina* (1781–1792). His astronomical observations were published from 1786 until his death in Vienna and Berlin Astronomical Calendar and in the treatises of the Royal Society of Science (Munzar 1996, 2001). He observed for instance eclipses of the Sun, the Moon and the Jupiter's Moons. Projection of parhelia was dealt with in 1790 in his work *Kurze Beschreibung, Erklärung und Abbildung der am 17. May 1790 erschienen Nebensonnen*. Antonín Strnad published also in Dresden edition *Sammlung physikalischer Aufsätze* his reflections on degrees of temperature (*Betrachtung über die verschiedenen Grade der Wärme ihren Nutzen, aus Versuchen und Beobachtungen*) and dealt also with mean barometric altitude of Prague. In 1788, he published a physical and meteorological calendar. Antonín Strnad wrote in total 23 meteorological studies, 31 works, reports and treatises on astronomy, four casual speeches and four popularization works. He also published 13 translations of Josef Stepling's Latin studies.

In 1784, Antonín Strnad married Kateřina Marsanová, an Italian living in Prague. They had four children: Kateřina, Leopold, Antonín and Aloisie. Although the

family lived in a very modest way, they were in contact with many Prague intellectuals and revivalists. For instance, Josef Jungmann gratefully used to think back to Strnad's lessons and support, which helped him to get a teaching post at a grammar school in Litoměřice. In his biography, he wrote about his great involvement in physical and astronomical geography.

In 1781, Antonín Strnad contributed to rescue and reparation of Prague astronomical clock (Figure 2). Already in 1760, Jan Klein tried to draw attention to this unique piece of work and to the necessity of its reconstruction. However, Prague city fathers were convinced that it was nothing else than scrap iron and intended to put it away (Horský 1988). Antonín Strnad initiated a commission charged to establish the extent of damage and the sum needed for reparation and to propose a solution. The Prague astronomical clock was then repaired under Strnad's supervision in the years 1787–1791. In 1788, he wrote a study on the astronomical clock *Von der Prager Uhr auf dem Altstädter Rathause aus Balbins Miscellaneen, mit Zusätzen und Anmerkungen*. Another work describing famous clockmaker's and artistic works in Prague Old Town City Hall and in Prague Observatory was published in Prague (1791) and in Dresden (1794). The Prague City Council acknowledged Antonín Strnad's merits and in 1793 took him and his sons among freemen of Prague.

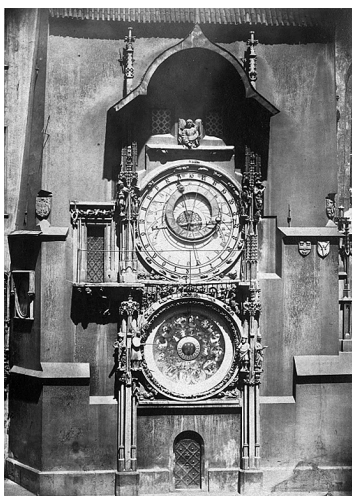


Fig. 2 Old Town astronomic clocks in 1890. Sources: Prague City Museum

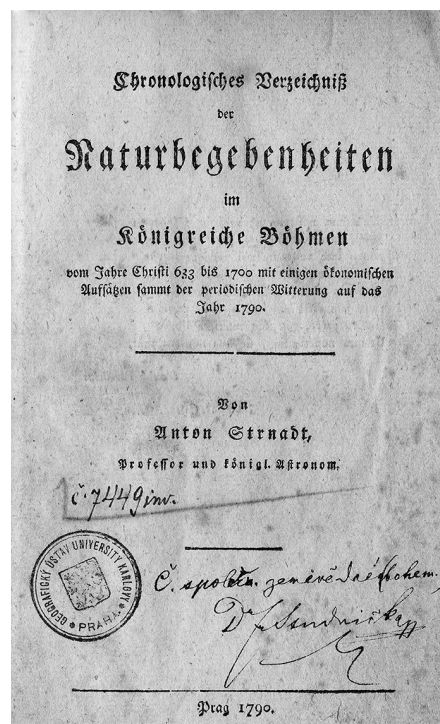


Fig. 3 Front-page of the book by Antonín Strnad (Anton Strnad) from 1790: *Chronologisches Verzeichniß der Naturbegebenheiten im Königreiche Böhmen vom Jahre Christi 633 bis 1700 mit einigen ökonomischen Aufsätzen sammt der periodischen Witterung auf das Jahr 1790*. Source: Royal Bohemian Society of Science, Prague

In 1784, Antonín Strnad became regular member of the Meteorological Scientific Society in Mannheim. He was also one of the founder members of the first Bohemian Learned Society, where he published in 1775 his first article on meteorology. This learned society was in 1784 called Societatis scientiarum Bohemica and since 1790 used the honorary title the Royal Bohemian Society of Science. Antonín Strnad published in *Abhandlungen* of the Royal Bohemian Society of Science in total 18 studies dealing mostly with meteorological subjects. He worked also as archivist, librarian and custodian of collections of this Society. In 1790, Antonín Strnad published in Prague his work *Chronologische Verzeichniß der Naturbegebenheiten in Königreiche Böhmen von Jahr 663–1700 mit einigen ökonomischen Aufsätzen auf das Jahr 1790* (Figure 3). Inspired by chronicles and old manuscripts, he described historically interesting natural phenomena, lists of comets, solar and lunar eclipses, hard winters and hot summers, crop failures, meteorite falls, floods and other catastrophes. In 1791, he gave lecture on solar eclipse at a solemn session of the Royal Bohemian Society of Science in which also the Emperor Leopold II took part.

Antonín Strnad was busy with popularization of science and since 1789 cooperated with the Patriotic Economic Society (Seydl 1947). His handbook *Physikalisches Taschenbuch auf das Jahr 1789 für Freunde der Ökonomie und Witterungskunde* was intended for farmers. Since



Fig. 4 Commemorative plaque of Professor Antonín Strnad by sculptor J. Plíšek in Náchod. Source: Náchod City Museum (Photography: Zdeněk Halíř)

1749 to his death, he reviewed Housekeeping Calendars published in Czech, although his scientific works were published in German and Latin. The first of them, published by the famous Czech patriot V. M. Kramerius, *Stoletý Kalendář na způsob Kryštofa z Helwiku* (1793), is at the same time a pioneering work on agrometeorology. In his Housekeeping Calendars he wrote also about the position of the Sun, planets, about animals' behaviour before rain and storm, he gave advice what to do each month in the field, vineyard, forest and garden. He occupied himself also with healthy diet and instructed lecturers on suspicious and poisonous plants and mushrooms. He wrote about beekeeping and about their treatment. He explained spontaneous ignition of hay, described smut fungus and how to remove it, he wrote about conservation of eggs. He paid attention to heating with hard coal, which was then only little known.

Exhausting work and distress due to bad economic situation of his family ruined Antonín Strnad's health. At the invitation of the Prince Ferdinand Kinský (1781–1812), he left Prague for Sazená Castle near Velvary to recuperate. Unfortunately, his serious illness was going worse and on September 23, 1799, he died in Sazená, aged only 53 years (Figure 4). His death inspired many of his contemporaries, patriots and near friends to speeches and literary works reminding of his scientific, human and patriotic qualities.

4. Conclusions

The progress in physical geography is a consequence of an expansion of theoretic conceptions and technologic means used in Earth and Space sciences. Since the 2nd half of the 18th century, the extent of space and time, in which it is possible to observe and investigate natural processes and objects, has sensibly increased. However, variability and style of professional activities of Antonín Strnad, especially his methodological approaches and scientific results, reflected pioneer stages of research efforts to apply mathematical and physical methods with specialized techniques and devices for determination, description and measurement of the components of the natural environment. He emphasized systematic and precise observations of natural processes and phenomena, cultivated and taught mathematics and physical geography as a part of natural sciences and published many papers concerning meteorology and mathematical geography. Professor Antonín Strnad is now recognized as one of the most significant personalities of Charles University in Prague during the Age of Enlightenment.

Acknowledgements

The article was prepared with support provided by the Ministry of Education, Youth and Sports of the Czech Re-

public, project MSM 0021620831 "Geographical Systems and Risk Processes in the Context of Global Change and European Integration".

REFERENCES

- ČORNEJOVÁ, I. (ed.) (1995): Dějiny Univerzity Karlovy. 2. sv. 1622–1802. Karolinum, Praha.
- GOUDIE, A. S., KALVODA, J. (2007): Variable faces of present-day geomorphology. In: Goudie, A. S., Kalvoda, J. (eds.): Geomorphological variations. P3K, Prague, pp. 11–17.
- HÄUFLER, V. (1967): Dějiny geografie na Univerzitě Karlově 1348–1967. Univerzita Karlova, Praha, 421 p.
- HORÁK, B. (1954): Dějiny zeměpisu I. a II. ČSAV, Praha.
- HORSKÝ, Z. (1988): Pražský orloj. Panorama, Praha.
- JELEČEK, L., CHROMÝ, P., MARTÍNEK, J. (2006): Vývoj geografie na Univerzitě Karlově v kontextu české geografie od poloviny 19. století. Geografie, 111, 4, 343–367.
- KOUKLOVÁ, M. (1989): Knihovna astronoma Antonína Strnada. Astronomický ústav ČSAV, Ondřejov.
- MUNZAR, J. (1996): Antonín Strnad (1746–1799): průkopník české meteorologie. Meteorologické zprávy, 49, 6, 161–166.
- MUNZAR, J. (2001): 200. výročí úmrtí astronoma Antonína Strnada (1746–1799). Bibliotheca Strahoviensis, No. 4–5, 269–271.
- NOVOTNÁ, E., KALVODA, J. (2012): Antonín Strnad (1746–1799) – the first professor of physical geography at Charles University in Prague. – Poster and Abstracts of the XV. International Conference of Historical Geographers, August 6–25, Prague, Czechia.
- PEJML, K. (1975): 200 let meteorologické observatoře v pražském Klementinu. SNTL, Praha.
- RICHTEROVÁ, A., ČORNEJOVÁ, I., et al. (2006): Jezuité a Klementinum. Národní knihovna ČR, Praha.
- SEYDL, O. (1939): Knihovna Antonína Strnada ředitele pražské hvězdárny (1746–1799): podle rukopisu knihovny královské kanonie premonstrátů na Strahově v Praze a jiných pramenů. Prometheus, Praha.
- SEYDL, O. (1947): Vědecká a buditecká činnost král. Astronoma Antonína Strnada: k dvoustému výročí jeho narozenin. Praha: Říše hvězd, 1947. Zvláštní otisk časopisu Říše hvězd, 27, No. 7–9.
- SCHUSTER, F. (1931): Život a dílo astronoma Antonína Strnada. Říše hvězd, 12, 6, 97–107.
- ŠOLCOVÁ, A. (1999): Život a zásluhy matematika, astronoma a meteorologa Antonína Strnada (1746–1799). Okresní muzeum v Náchodě, Náchod.
- VLČKOVÁ, V. (1999): Antonín Strnad: náchodský rodák (1746–1799): astronom, meteorolog, matematik: 200 let výročí úmrtí. Město Náchod, Náchod.

RÉSUMÉ

Antonín Strnad (1746–1799) – první profesor fyzické geografie na Univerzitě Karlově v Praze

Druhá polovina 18. století byla jedním z významných období rozvoje přírodních věd na Univerzitě Karlově v Praze. Významnou osobností matematiky, astronomie a fyzické geografie Artistické (Filosofické) fakulty se v té době stal Antonín Strnad. Narodil se 10. srpna 1746 v Náchodě ve východních Čechách a získal rozsáhlé

vzdělání jako student Jezuitského řádu v Brně, Uherském Hradišti a Olomouci. Antonín Strnad pracoval v Praze od roku 1771, a to nejprve jako asistent Josefa Steplinga (1716–1778), který byl zakladatelem astronomické a meteorologické observatoře v Klementinu (1751). Ředitelem této observatoře se Antonín Strnad stal v roce 1781, dále byl administrátorem Matematického muzea (1774–1785) a ředitelem Královské české společnosti věd (1787–1788). V roce 1784 se Antonín Strnad stal členem Meteorologické vědecké společnosti v Mannheimu a spolupracoval s podobně zaměřenými společnostmi v Berlíně, Vídni a Lipsku. Profesorem matematiky a fyzické geografie byl jmenován v roce 1778, děkanem Artistické fakulty v roce 1792 a rektorem Karlovy-Ferdinandovy Univerzity v roce 1795.

Antonín Strnad inicioval záchranu a generální opravu Staroměstského orloje, proslulá byla jeho vědecká knihovna a vynikající odborné i populární přednášky. Zdůrazňoval nezbytnost systematických a přesných pozorování přírodních procesů a jevů, rozvíjel

matematiku a fyzickou geografii jako součásti přírodních věd a publikoval řadu odborných i populárně-naučných prací, zabývajících se zejména meteorologií a matematickou geografii. Podstatným rysem Strnadovy rozsáhlé činnosti byl vyhraněný smysl pro využívání výsledků odborné práce ve prospěch společnosti. Upřesnil geografickou polohu observatoře v Klementinu, prováděl zde pravidelná meteorologická měření, včetně sledování změn magnetické deklinace, pozoroval zatmění Slunce a Měsíce, popsal historicky známé katastrofické jevy, např. velmi chladné zimy, horká léta, krupobití, povodně a pády meteoritů a byl zaníceným průkopníkem agrometeorologie.

Vyčerpávající práce a neutěšená ekonomická situace rodiny podlomily jeho zdraví. Antonín Strnad zemřel po těžké nemoci 23. září 1799 na zámku Sazená a je pohřben na hřbitově u kostela Sv. Klimenta v Chržíně u Velvar ve středních Čechách. V současné době je uznáván jako jedna z nejvýznamnějších osobností Univerzity Karlovy v Praze v osvícenských dobách.

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