

Aurorae Borealis Studia Classica

Vol. XVII

Articles on the aurora borealis in the
Acta Societatis Regiæ Scientiarum Upsaliensis
(1740–1750)

by Anders Celsius
and Olof Peter Hiorter

digitized, with an introduction and summary
of contents by Per Pippin Aspaas

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The seventeenth volume in the series presents articles on the aurora borealis published in the journal of the Swedish Societas Regia Literaria et Scientiarum (now Kungl. Vetenskaps-Societeten i Uppsala) covering the years 1740 to 1750. In this period, the Acta of the society were edited by the natural historian Carolus Linnaeus (Carl von Linné), who showed less interest in the aurora than his predecessors. One article on the aurora by Anders Celsius and another by his assistant Olof Peter Hiorter were however published. They are presented here along with the obituaries for three central auroral researchers from early eighteenth-century Sweden - Erik Johan Burman, Conrad Quensel and Celsius. In the Introduction, neo-Latinist and historian of science Per Pippin Aspaas summarizes these texts and provides a short history of the society in the period.

- The editor

Items digitized for this volume:

** An [article on the aurora borealis](#) in the *Acta Societatis Regiæ Scientiarum Upsaliensis Ad Annum MDCCXL* (printed 1744), digitized by the Biodiversity Heritage Library and provided with full-text searchability by Per Pippin Aspaas. The text recognition software Transkribus was used for the OCR (optical character recognition) process; the OCR generated by Transkribus was manually proofread according to the guidelines of the ERC-funded NOSCEMUS project. The entire volume can be found [here](#).

** An [article on the aurora borealis](#) and an [obituary for Anders Celsius](#) in the *Acta Societatis Regiæ Scientiarum Upsaliensis Ab Anno DMCCXLIV Ad MDCCCL* (printed 1751), digitized by the Biodiversity Heritage Library and provided with full-text searchability by Per Pippin Aspaas, methodology as above. The entire volume can be found [here](#).

** An [obituary for Erik Johan Burman](#) and [an obituary for Conrad Quensel](#) from the *Acta Literaria et Scientiarum Sveciæ*, Volumen Tertium (1730-1734), digitized and provided with full-text searchability by Uppsala Universitetsbibliotek in partnership with the [eBooks On Demand](#) service. The entire volume can be found [here](#).

THE SWEDISH *SOCIETAS REGIA LITERARIA ET SCIENTIARUM* AND THE THIRD DECADE OF ITS *ACTA* (1740–1750)

Introduction
by Per Pippin Aspaas

A cross-disciplinary learned society was founded in the Swedish university town Uppsala in 1719. In 1728, it acquired a set of statutes, and the epithet *Regia* (Royal) was added to its name. The *Societas Regia Literaria et Scientiarum* (Royal Society of Learning and Sciences)¹ still exists today, under the name of *Kungl. Vetenskaps-Societeten i Uppsala*. Since 1720, it issued a journal of *Acta* (proceedings). The driving forces – and chief editors of the *Acta* – of the Uppsala society during the 1720s and 1730s were the astronomer and meteorologist Erik Johan Burman (1692–1729) and his pupil and successor as professor of astronomy, **Anders** (Andreas) **Celsius** (1701–1744).² The latter passed away not long after the *Acta* for the year 1739 had been published. A new era began for Uppsala’s Royal Society, dominated by the famous natural historian and founder of the binomial taxonomy system still in use for botany and zoology, professor Carolus Linnaeus (later ennobled Carl von Linné, 1707–1778).

In the period covered here (1740 to 1750), the periodical of the society was known as *Acta Societatis Regiae Scientiarum Upsaliensis* (Proceedings of the Royal Society of Sciences in Uppsala). When it started in the 1720s, its name was simply *Acta Literaria Sveciae* (Learned Proceedings of Sweden); during the years 1730 to 1739, it was renamed *Acta Literaria et Scientiarum Sveciae* (Sweden’s Proceedings of Learning and Sciences). Responsible for the *Acta* during the third decade of their existence was Linnaeus, under whose editorship the aurora borealis was treated more sparsely and unsystematically than it had been before. Moreover, the

¹ All translations in this Introduction are by Per Pippin Aspaas.

² On Burman, see *Aurorae Borealis Studia Classica*, [Vol. XIII](#); on Celsius, see especially [Vol. XV](#) and [Vol. XVI](#).



publication pace of the *Acta* proved difficult to sustain, with only five issues appearing in Linnaeus' early period as a secretary (Table adapted from Ellegren 2020, p. 43):

Anni 1740 (132 pages. Nine articles, incl. one mentioning the aurora): published 1744
 Anni 1741 (122 pages. Ten articles, incl. one mentioning the aurora): published 1746
 Anni 1742 (128 pages. Ten articles, none on the aurora): published 1748
 Anni 1743 (140 pages. Five articles, none on the aurora): published 1749
 Ab Anno 1744 ad 1750 (170 pages. 22 articles, none on the aurora): published 1751

There then followed a hiatus of more than twenty years, during which time no proceedings were issued whatsoever. Finally, towards the very end of Linnaeus' period as secretary, a series of *Nova Acta* were launched in 1774 (official year of printing: 1773). That series falls outside the scope of this volume of *Aurorae Borealis Studia Classica*, however.

Although the Royal Society of Uppsala had ambitions to serve as *the* national switchboard for exchange of scientific ideas and empirical observations, it never quite achieved its goal. Instead, in 1739 a Royal Academy of Sciences (*Kungl. Vetenskapsakademien*) was founded in the capital. The two scientific bodies co-existed alongside each other, the Uppsala society continuing to publish its proceedings in Latin, whereas the Stockholm academy launched a series of proceedings (*Handlingar*) in Swedish as well as German (*Beiträge*). The Stockholm Academy's proceedings came out at a much quicker pace than the Uppsala Society ever managed. There appears, however, not to have been any animosity between the two societies. Celsius, for instance, published papers in the *Handlingar* as well as the *Acta*. His former student at Uppsala, the Stockholm Academy secretary Pehr Wilhelm Wargentín (1717–1783), besides editing and writing for the *Handlingar*, also contributed to the *Acta*. Moreover, Linnaeus himself frequently participated at sessions of the Academy in Stockholm and published a substantial number of articles in its *Handlingar* as well as in the *Acta* that he edited in Uppsala.

During the 1740s, the aurora borealis was only treated in two articles in the *Acta*: one by Celsius containing his meteorological report from Uppsala for the year 1740, another by his assistant, **Olof Peter** (Olavus Petrus) **Hiorter** (1696–1750), who published an analogous meteorological report for the year 1741.³ A military lawyer's son, Hiorter was raised at Rödön and educated at Frösön and Härnösand in Jämtland Province before moving to Uppsala for studies at university level in 1713. After a one and a half years as a student of astronomy he became a private teacher. In this capacity, he escorted a young nobleman on a Grand Tour to the Dutch Republic, during which he lingered in Utrecht as an assistant of Pieter (Petrus) van Musschenbroek (1692–1761) before returning to Sweden. Thanks to noble sponsorship Hiorter was able to return to Uppsala University in 1732, where he was quickly chosen to substitute Celsius as a teacher of astronomy during the latter's Tour of Europe, which lasted nearly four years. Since then, Hiorter collaborated ever more closely with Celsius, whose sister he married in 1742. Hiorter applied

³ The following account of Hiorter's life is based on Nordenmark 1942.

to become Celsius' successor as professor of astronomy after his untimely death in 1744 but failed to obtain this post. He managed, however, to become the head of the recently constructed Observatory of Uppsala, with the title *Observator Regius*. As Royal Observer, he continued his studies of meteorology and astronomy until he passed away in April 1750.

In the history of auroral research, Hiorter is primarily remembered for a paper, published in Stockholm's *Handlingar*, in which he documented that a compass needle would exhibit irregular behaviour when an aurora was seen in the sky (Hiorter 1747; see also Widmalm 2012). This, he claimed, had first been noticed by his mentor, the late Celsius. Supported by Celsius, Hiorter had made several observations ever since the years 1740–41 corroborating that effects on the magnetic needle coincided with auroral outbreaks. Celsius/Hiorter's discovery, foreshadowing the nineteenth-century discovery of electromagnetism (see *Aurorae Borealis Studia Classica*, [Vol. X](#)), was an important step in the development of geophysics.

The meteorological reports in the *Acta* – Celsius' on the year 1740 and Hiorter's on the year 1741 – are both silent on the variations of the magnetic needle. The discovery is, however, mentioned in an anonymous obituary for Celsius, published in the issue of the *Acta* covering the years 1744 to 1750 (printed 1751).⁴

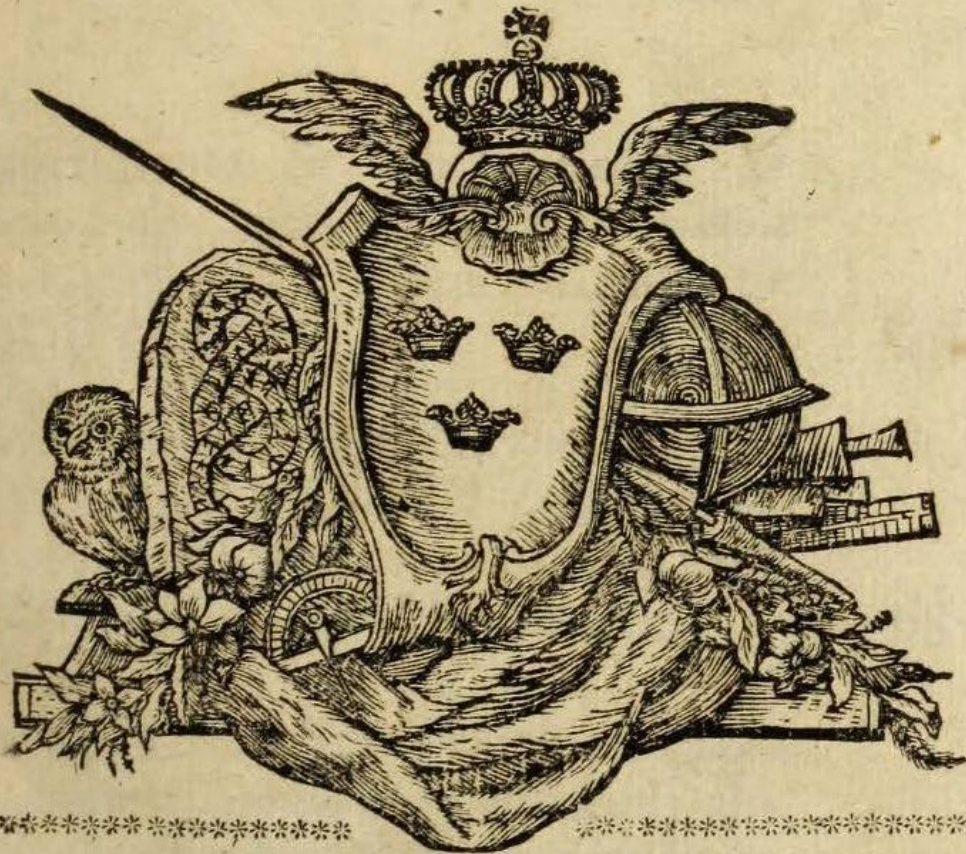
With this volume, a mini-series of the *Aurorae Borealis Studia Classica* covering Latin texts by Swedish scholars from the first half of the eighteenth century has reached completion. Although the *Acta* of the Uppsala society from the 1740s contained only two articles on the aurora, the obituaries of three major characters in Swedish auroral research have been included here as a supplement – on Erik Johan Burman, Conrad Quensel and Celsius. A brief description of their contents can be found below.

⁴ See below, p. 9. This obituary in the *Acta* appears to be a slightly abbreviated version of Höpken 1745, translated into Latin.

ACTA
SOCIETATIS REGIÆ
SCIENTIARUM
UPSALIENSIS.

AD ANNUM MDCCXL.

U. I.



STOCKHOLMIÆ
Typis & sumtibus LAURENTII SALVII.
Anno 1744.

S.

ACTA SOCIETATIS REGIÆ SCIENTIARUM UPSALIENSIS (1740–1750)

Summary of contents pertaining to the aurora borealis by Per Pippin Aspaas

The report on **OBSERVATIONES METEOROLOGICÆ HABITÆ, Upsaliæ Anno 1740 ab AND. CELSIO** (Meteorological observations conducted in Uppsala in the year 1740 by Anders Celsius) was published in the issue Ad Annum MDCCXL (printed 1744), on pp. 38–47. After tabular overviews of barometer and thermometer observations there follows an account of the extremely harsh winter (pp. 39–40), a tabular overview of precipitation (p. 41) and a section about *Aëris constitutio & Venti* (condition of the air and winds) (pp. 41–43). In this section, observations of distant lightning close to the horizon – “*Kornblixt* in our language” – are mentioned on the nights following 18 and 20 August (p. 42). There are also descriptions of thunder on 29 August (p. 42) and lightning on 5 December (p. 43). These descriptions are of interest since one influential eighteenth-century theory regarding the aurora considered it to be related to thunderstorms (see for example *Aurorae Borealis Studia Classica* [Vol. XI](#)).

The fifth and last section of the article deals with the *Lumen Boreale* (pp. 43–47). As for the possible connection between the aurora and thunderstorm, this is not explicitly mentioned. Only one of the above dates coincides with an auroral observation (p. 46):

On the night between the 18th and 19th [of August], an immobile shiny bow. At 1:20 past midnight, the upper edge of the bow lay just underneath the end of the tail of Ursa Major; the same vertical circle did however pass through the top of the bow and through the *Gamma* [Phecda] and *Beta* [Merak] of *Ursa Minor*, although tilting slightly towards the west.

The lack of discussion of the silent lightning phenomena observed on the same night implicitly suggests that Celsius saw no connection between *Kornblixt* and *Norrskjen* (northern lights), in contrast to the Lund professor Conrad Quensel, who discussed this extensively in his 1726 dissertation (*Aurorae Borealis Studia Classica*, [Vol. XIV](#)). The rest of the observations – 33 in total – are described with a level of detail ranging from one short sentence to about half a page. Like in the example above, theoretical deliberations are avoided. The observations are

distributed as follows (all dates according to the Julian style calendar in use in Sweden at the time):

January	14 th , 19 th , 21 st
February	12 th , 16 th , 17 th , 22 nd , 29 th
March	8 th , 12 th , 13 th , 15 th
April	-
May	11 th
June	midnight 29 th /30 th
July	-
August	6 th , 10 th , night 18 th /19 th
September	1 st , 4 th , 14 th , 15 th
October	5 th , 9 th , 12 th , 13 th , 16 th , 20 th , 23 rd , 31 st
November	5 th , 26 th
December	7 th , 9 th

In the issue *Ab Anno MDCCXLIV Ad MDCCCL* (printed 1751), on pp. 95–111, is the report on **OBSERVATIONES METEOROLOGICÆ, habitæ Upsaliæ Anno 1741. ab OLAV. PETR. HIORTER** (Meteorological observations conducted in Uppsala in the year 1741 by Olof Peter Hiorter). Tabular overviews of air pressure, temperature and precipitation (pp. 95–97) are followed by sections on *Aëris constitutio & Venti* (condition of the air and winds) (pp. 98–100) and *Lumen Boreale* (northern light) (pp. 100–111). The section on the aurora is thus by far the most extensive and detailed. Theoretical deliberations are, however, avoided.

Hiorter mentions *parhelius* (mock sun) and *halo* (ring around the moon) among weather phenomena (pp. 98–99) but without comparing these optical phenomena with northern lights or placing them in the same category as these, as certain eighteenth-century investigators were inclined to do (see *Aurorae Borealis Studia Classica*, [Vol. IV](#)). Nor are descriptions of thunderstorms in the section on the air and winds commented upon in the *Lumen Boreale* section.

Hiorter's descriptions of auroral observations – a record 76 in total – vary from one short sentence to more than one page in length. They are recorded on the following dates (Julian style):

January	3 rd , 8 th , 9 th , 10 th , 12 th , 13 th , 15 th , 22 nd , 27 th , 28 th , 29 th
February	6 th , 14 th , 19 th , 22 nd , 24 th
March	1 st , 2 nd , 15 th , 8 th [probably a misprint for 18], 19 th , 24 th , 26 th , 29 th , 30 th
April	2 nd , 4 th , 5 th
May	-
June	-
July	12 th , 28 th , 29 th , 30 th
August	2 nd , 3 rd , 8 th , 9 th , 10 th , 11 th , 12 th , 24 th , 25 th , 26 th , 27 th , 28 th , 29 th , 30 th , 31 st
September	4 th , 21 st , 22 nd , 23 rd , 24 th , 27 th , 28 th , 29 th , 30 th
October	4 th , 5 th , 6 th , 8 th , 24 th , 26 th , 31 st
November	1 st , 3 rd , 6 th , 18 th , 20 th , 21 st , 23 rd , 27 th
December	1 st , 6 th , 7 th , 10 th

The **Vita ERICI BURMAN** was published in the *Acta Anni MDCCXXX*, pp. 114–120. The anonymous author provides a sketch of the private and professional life of the late professor and does mention that he was active within the fields of astronomy and meteorology. He fails, however, to single out Burman’s work on the aurora borealis. For more on Erik Johan Burman, see the Introduction to *Aurorae Borealis Studia Classica*, [Vol. XIII](#).

The **Vita CONRADI QUENSEL** was published in the *Acta Anni MDCCXXXIV*, pp. 88–94. Here as well, the anonymous author sketches the private and professional life of the deceased fellow of the society. Although several publications are referred to in the obituary, Quensel’s contributions to auroral research are missing, as are his meteorological studies altogether. For a presentation of Conrad Quensel as an auroral researcher, see the Introduction to *Aurorae Borealis Studia Classica*, [Vol. XIV](#).

The **Vita ANDREÆ CELSII** was published as the last item in the *Acta Ab Anno MDCCXLIV Ad MDCCL*, pp. 158–170. In the chronological enumeration of important stages in Celsius’ career, the anonymous author briefly mentions that on his journey between Berlin and Bologna in 1732, Celsius “stopped for some time in Nuremberg, where he [...] published a little book on the *Lumen Boreale*, noteworthy for the observations of this bewildering meteorological phenomenon made by himself and others” (p. 162). Other achievements – like Celsius’ role in the famous expedition of Maupertuis – are far more amply described. Yet, later in the obituary, the author does return to the aurora (p. 168):

He paid attention to the declinations, inclinations, and annual as well as diurnal variations of the magnetic needle. In this area, he discovered many things that had never been noted before. One thing he noted in particular was that the northern lights (*aurorae Boreales*) affect the needle and often disturb it quite significantly.

The efforts of Hiorter in this domain are not mentioned at all. Nevertheless, when approaching the end of the story, the writer of the obituary brings in the role of Celsius’ assistant (p. 169):

He [i.e., Celsius] was furnished with a very fragile bodily health, which by no means corresponded to his vivid intellect. At daytime, he lectured for the youth, at night, he stayed up observing. With this lifestyle he would likely have deserted us sooner than he did, if it were not for his associate Mister Hiorter, whose enduring and trusted partnership he relied on in his work. It is true that Hiorter was related to our friend Celsius by blood, but their love and passion for science made their relationship even closer: the former was to the latter the same as Theseus was to Hercules or Achates to Aeneas.

Translated into modern popular culture, one could say that Hiorter was to Celsius what Sam was to Frodo. Judging from the *Acta* of the 1740s they were, however, marginal figures to the natural historian Linnaeus, under whose editorship their passion for the science of the aurora was far less prominent than it had been in previous decades.

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