

Aurorae Borealis Studia Classica

Vol. XVI

Articles on the aurora borealis in the
Acta Literaria et Scientiarum Sveciæ
(1730–1739)

by Anders Celsius, Herman Spöring, Sven
Hof, Johan Göstaf Hallman, Johan
Sparschuch and Nils Wallerius

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

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The sixteenth volume in the series presents all articles on the aurora borealis that were published in the journal of the Swedish Societas Regia Literaria et Scientiarum (now Kungl. Vetenskaps-Societeten i Uppsala) from 1730 to 1739. The articles are by the society's secretary, the professor of astronomy in Uppsala, Anders (in Latin: Andreas) Celsius and by several other Swedish professionals and amateurs of science. In the introduction to this volume, neo-Latinist and historian of science Per Pippin Aspaas summarizes the contents of all articles dealing with the aurora and presents extracts of these texts in English translation. He also provides a short history of the society in the period and gives brief presentations of Anders Celsius, Herman Spöring, Sven Hof, Johan Göstaf Hallman, Johan Sparschuch and Nils Wallerius as auroral researchers.

Volumen Tertium was digitized and enriched with full-text searchability, probably by means of the legacy software ABBY (see below). As for Volumen Quartum, in March 2023, image-only scans of selected parts were enriched with full-text searchability by myself, for inclusion in this volume of *Aurorae Borealis Studia Classica*. OCR (optical character recognition) of the said parts of Volumen Quartum was done with the Transkribus software using the [NOSCEMUS model](#) for early modern Latin. I thank Dr. Stefan Zathammer for his assistance and guidance.

- The editor

Items digitized for this volume:

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THE SWEDISH *SOCIETAS REGIA LITERARIA ET SCIENTIARUM* AND THE SECOND DECADE OF ITS *ACTA* (1730–1739)

Introduction
by Per Pippin Aspaas

A *Societas Literaria*, or Society of Learning, was founded in Uppsala in November 1719. By royal decree, the society obtained a formal set of statutes in 1728 along with the official name *Societas Regia Literaria et Scientiarum* (Royal Society of Learning and Sciences, hereafter Society).¹ It persists to this day under the name Kungl. Vetenskaps-Societeten i Uppsala. Included in this volume are all articles on the aurora borealis printed in the proceedings (*Acta*) of the Society for the years 1730–1739. As context for the reader, the title page and table of contents for each annual issue of the *Acta* have been included, followed by the relevant articles in chronological order. In cases where the issue in question contains an *Errata* page of relevance, this has been included as well.

A key member of the Society was the secretary. This function was invariably given to someone affiliated to Uppsala University. The incumbent was to manage the daily business of the Society (organizing meetings, writing minutes thereof, corresponding with out-of-town members, and so on) on top of his daily chores at the university. The secretary was also the editor of the *Acta*.

The secretary from 1725 onwards was the astronomer and meteorologist **Anders** (in Latin: Andreas) **Celsius** (1701–1744), whose separate monograph on auroral observations from Sweden can be found in *Aurorae Borealis Studia Classica*, [vol. XV](#). During Celsius' absence on a Grand Tour of Europe in 1732–36 followed by a research trip to far-northern Sweden and Finland in the company of amongst others Pierre Louis Moreau de Maupertuis (1698–1759) in 1736–37, two other fellows of the Society substituted him as secretaries. First, the mathematician Samuel Klingenstierna (1698–1765) functioned briefly in 1732–33, before the

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

historian of languages Johan Ihre (1707–1780) took over in the autumn of 1733 and seemingly kept the post until Celsius returned to Uppsala in the autumn of 1737.

Klingenstierna, upon the initiative of astronomer Olof Peter (Olavus Petrus) Hiorter (1696–1750), instigated a massive program for observations of a solar eclipse taking place on 2 May 1733 (Julian style), resulting in more than 60 individual Swedish observation reports that were later published in the *Acta*.² By contrast, during Ihre's time in office, no minutes were made; perhaps he did not convene the Society for official sessions at all. Nor did he coordinate astronomical or meteorological observations on a national scale in the way Klingenstierna, Celsius and his predecessor, the late professor of astronomy Erik Johan Burman (1692–1729) once did. Nevertheless, as we shall see below most issues of the *Acta* covering this period do contain contributions on meteorology and other natural sciences alongside historical, archaeological and philological research. The cross-disciplinary nature of the Society was intact.

The *Acta* covering the years 1720–1729 were presented in *Aurorae Borealis Studia Classica*, [vol. XIII](#). From the Anni 1730 onwards, the full name of the series was no longer *Acta Literaria Sveciæ*, but *Acta Literaria et Scientiarum Sveciæ* (Sweden's Proceedings of Learning and Sciences). As before, each five-year period was considered to constitute one volume. However, the trimester system (four issues per year) of the 1720s was dropped. In the decade covered in this issue of *Aurorae Borealis Studia Classica*, the *Acta* instead came out in annual editions, often with a significant time lag of up to three or four years. According to a recent history of the Society (Ellegren 2019), the following printing years apply:

Anni 1730 (ed. by Celsius, printing organized by Celsius): published 1732
 Anni 1731 (ed. by Celsius, printing organized by Ihre): published 1735
 Anni 1732 (ed. by Ihre, printing organized by Ihre): published 1735
 Anni 1733 (ed. by Ihre, printing organized by Ihre): published 1736
 Anni 1734 (ed. by Celsius, printing organized by Celsius): published 1738
 ...
 Anni 1739 (ed. by Celsius, printing organized by Celsius): published 1742

The length of each annual issue ranged between 94 and 128 pages of text plus table of contents, illustrations and other non-paginated material. Not long after the publication of the 1739 issue, in April 1744 Celsius died of tuberculosis. The *Acta* were subsequently edited by Carl von Linné (Carolus Linnæus, 1707–1778), who took over the post as secretary after Celsius' death.³

² *Historia Eclipseos Solis, quæ totalis cum mora Scandinaviæ, præcipuæ Gothiæ, incolis apparuit Anno 1733 die 2 Maji horis vespertinis, ex observationibus cum Societate Regia communicata excerpta ab AND. CELSIO* [i.e., History of the Eclipse of the Sun, which appeared with Total Duration to Inhabitants of Scandinavia, especially those in Götaland, in the Evening Hours of 2 May of the Year 1733, excerpted by Anders Celsius from Observations communicated to the Royal Society], in: Anni MDCCXXXV, pp. 48–67. Note that Sweden used the Julian calendar until 1751, when the Gregorian calendar was introduced. All dates in the *Acta* were thus given in the Julian style; this system has been kept in this Introduction as well.

³ Articles on the aurora borealis in the *Acta* covering the third decade of the Uppsala Society will be presented in *Aurorae Borealis Studia Classica*, vol. XVII.

Apart from the above-mentioned Celsius, who mentions or elaborates on the aurora borealis in papers for the Acta Anni 1730, 1731, 1734, 1737 and 1739, there were five other scholars whose papers on the northern lights were included in various issues of the 1730s.

[Herman \(Hermannus\) Diedrich Spöring the Elder \(1701-1747\)](#) grew up in Stockholm, studied medicine in Uppsala and then visited several continental universities before being appointed professor of medicine in Finnish Åbo (Turku) in 1726. Spöring had broad interests besides his core field of expertise and contributed to Celsius' 1733 treatise on Swedish observations of the aurora (*Aurorae Borealis Studia Classica*, [vol. XV](#)). In the Acta Anni 1730, his meteorological report for the year 1730 is included, including a brief paragraph on the aurora.

[Sven \(Sveno\) Hof \(1703-1786\)](#) is primarily remembered as a teacher and pioneer in the study of Swedish dialects (Eriksson 1971-73), but he had strong interests also in the natural sciences. In a paper for the Acta Anni 1734, he describes a rare meteorological phenomenon that he had witnessed in Näs near Enköping in Uppland during his time as a student at Uppsala University. In his paper, Hof also discusses the aurora borealis.

The gymnasium teacher and theologian [Johan \(Johannes\) Sparschuch \(1699-1781\)](#) graduated with a thesis in astronomy in 1730, with Celsius as *praeses*. In 1732-39, he was based at Linköping. During this period, he wrote three papers with weather reports for the Acta (Anni 1736, 1737 and 1738). In these meteorological papers, Sparschuch includes observations of the aurora, in accordance with the practice established by Burman and Celsius in the 1720s.

The pastor, historian and poet [Johan Göstaf \(Johannes Gustavus\) Hallman \(1701-1757\)](#) from Närke studied at Uppsala University, where he graduated in 1726 with a thesis on the local history of his home region. He evidently had interests in the natural sciences as well, as his article in the Acta Anni 1730 demonstrates. He there discusses some optical/meteorological phenomena, including the aurora.

[Nils \(Nicolaus\) Wallerius \(1706-1764\)](#) had started out as a student of physics at Uppsala, though he had a wide set of research interests and ultimately ended up with professorships in logic and theology. For the Acta Anni 1737, he authored a paper on a series of auroral observations that he had made in Uppsala in late 1736 and early 1737 (during Celsius' absence).

References

Ellegren, Hans: *Hvad nytt och nyttigt: Tillkomsten av landets första lärda sällskap: Kungl. Vetenskaps-Societeten i Uppsala*. Uppsala 2019 (also available [online](#))

Manne Eriksson: Sven Hof, in *Svenskt biografiskt lexikon* (orig. 1971-73), [online version](#)

XIII.

Meteoron ignitum

d. 3 Martii ann. 1731 Upsalæ observatum ab
ANDREA CELSIO.

Vesperis satis splendens erat Luna, splendentes stellæ & cœlum serenum, si exceperis spatium inter caput *Ursa majoris* & humeros *Boota* usque ad *Eclipticam* & *Leonis* stellæ &c. qua latitudinem, qua longitudinem vero ad utrumque fere horizontem, ortivum puta & occiduum, perque plagas ONO & WSW. Hoc spatium obtinuit fascia lucens aut Aurora borealis, instar tenuioris & intermittentis nubeculæ, subobscura & parum sese commovens.

In boreali plaga NNW clarior quidam arcus, sed pallidus & omni motu carens inter 7 & 8 gradum supra horizontem attollebatur. Hæc facies cœli erat, quum hora vespertina 9. 20 min. subito existeret maxime fulgens radius, qui instar globi cum cauda acuminata circa stellam β in capite *Bootis* accensus illuxit, pergens recta per eam regionem cœli, quam obtinebat memorata luminosa fascia, omne peragravit spatium, quod inter *Booten* & *Hados*, inque 45 gradu altitudinis cœli occidentalis exstinctus est.

Erat, eximii hujus fulgoris duratio 5, vel 6 secundorum, & mox omnia in eodem quo antea statu. Sed post aliquod temporis, quod semiminutum primum vix excedebat, tonitru exstitit, non cum fragore; verum a meridie per occidentem versus boream eundo murmurans, & ejusdem durationis fere cum dicta lucidissima facula.

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Ab

ACTA LITERARIA ET SCIENTIARUM SVECIAE, 1730-1739

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

VOLUMEN TERTIUM Continens annos 1730. 1731. 1732. 1733. & 1734.

In the Anni MDCCXXX issue, there are three articles that mention the aurora borealis. The first, on pp. 67-69, is by Johan Göstaf Hallman. When presenting his **Observatio Meteoris Igniti ad officinam sulphuream in Nericia A:o 1727 die 11 Octobr. facta á JOH. GUST. HALLMAN** (Observation of an Ignited Meteorological Phenomenon near the Sulphur Mine in Närke, on 11 October 1727), Hallman claims that the region in question is more prone to be filled with sulphureous exhalations than any other place in the north because the ground is so replete with sulphur. Besides, the mining activity itself produces sulphureous emissions. Both circumstances - both the spontaneous exhalations and the man-made emissions - creates various phenomena of light. "These differ from ordinary *casmata* or *lumina borealia* by always being spotted closer to the earth itself, even inside of buildings" (p. 68), he explains. One particular light phenomenon is then described in some detail (p. 69).⁴ As an afterthought, Hallman adds that:

What profit - in the form of light shed on other *lumina borealia* and *casmata* - there can be extracted from the notable origin of this particular meteorological phenomenon, is not for me to say. I will submit that question to the examination of the learned world; as for my own contribution, let it suffice that I have described the phenomenon meticulously.

The next article of relevance in the Anni MDCCXXX issue is **ANDREÆ CELSII Observationes Meteorologicae habitæ Upsaliæ Anno 1730** (Anders Celsius' Meteorological Observations made in Uppsala in the Year 1730), on pp. 101-106. After an account about barometer and thermometer measurements along with more narrative accounts of peculiarities about the general weather conditions in the country that year in general, Celsius adds a short paragraph on the aurora, inserting some advertisement for his forthcoming book in the process (p. 106):⁵

⁴ Strangely, Hallman refers to an illustration (Tab. II), but there is no illustration accompanying the article, at least not in the copy consulted for this issue of *Aurorae Borealis Studia Classica*.

⁵ As for the separate treatise by Celsius, published in 1733, see *Aurorae Borealis Studia Classica*, [vol. XV](#).

We observed the *aurora borealis* in the evening hours of 4 and 26 February; 19 and 24 September; and 22, 24, 23, 25 and 29 October. In a separate treatise (if God wills) we intend to give a more comprehensive description of these lights as well as others that were recorded at various other places in Sweden.

Immediately after the report by Celsius, on pp. 106–109 there follows **HERMANNI D. SPÖRING Epitome Observationum Meteorologicarum Aboëns. Anni 1730** (Herman D[iedrich] Spöring's Summary of Meteorological Observations from Åbo [=Turku] in the Year 1730). His article follows the same structure as that of Celsius. Its concluding two paragraphs can be translated thus (p. 109):

The *lumen boreale* lit up the evening sky on twenty-three occasions, namely, 23 February; 4 and 11 March; 3 and 21 April; 3, 13, 18, 22 and 24 August; 26, 27, 28 and 30 September; 1 and 24 October; 1, 3, 10, 21 and 28 November; 6 and 14 December.

Especially noteworthy in its outward appearance was yet another *lumen boreale* of 24 April, which exhibited a triple bow that soon merged into one. I saw a double bow of this kind on 30 September.

The next year, Anni MDCCXXXI, has only a single article mentioning the aurora, titled **Observationes Meteorologicae Upsaliae habitae Anno 1731, ab ANDR. CELSIO, Astron. Prof. & Soc. Reg. Secr.** (Meteorological Observations made in Uppsala in the Year 1731 by Anders Celsius, Professor of Astronomy and Secretary of the Royal Society), on pp. 39–44. It follows the same format as his weather report from the preceding year, including a brief paragraph towards the end, listing auroral observations (p. 44).⁶

The *lumen boreale* illuminated the evening sky on 24 January; 19 and 21 February; 3 March, 10, 16, 19 and 20 August; 15, 19, 22, 23, 26 and 27 September; 5 and 12 October; 20, 23, 25 and 26 December.

In the Anni MDCCXXII and MDCCXXIII, edited by Ihre, there are no articles on the aurora borealis. In the Anni MDCCXXXIV, however, the aurora is mentioned in a series of short papers on unusual phenomena of meteorology or optics. On pp. 78–79 there is a report on a **Meteoron igneum observatum á SVENONE HOF** (An Igneous Meteorological Phenomenon Observed by Sven Hof). The report is about an extraordinary phenomenon of light that filled at least a quarter of the sky in Näs, Uppland and that was followed by thunderous sounds. Hof mentions that the following day (2 October 1729) was “serene, only with mild breezes”. That evening, “a major *chasma*, or luminous phenomenon of the north, in Swedish *Norrskien* appeared” (p. 79). There then followed several days of stormy weather.

On pp. 81–82 of the same issue, there is a similar report on a **Meteoron ignitum d. 3 Martii ann. 1731 Upsaliae observatum ab ANDREA CELSIO** (An Ignited Meteorological

⁶ For a comprehensive list of observations recorded in the Acta in the period up to the year 1732, see the dataset P.P. Aspaas: “Swedish observations of the Aurora Borealis in the period 1716–1732 in contemporaneous scholarly publications”, DataverseNO, 2023, <https://doi.org/10.18710/G5J4YS>.

Phenomenon of the 3rd of March 1731, Observed by Anders Celsius). On a serene night Celsius saw “a luminous band, or *Aurora borealis*, like a very thin and intermittent cloud, rather obscure and displaying very little movement” (p. 81). Like Hof’s report, the main point of Celsius’ article is not to contribute to the study of the aurora, but to discuss and describe in detail a rare phenomenon of light, namely “a very bright circular object, which, in the form of a ball with a pointed tail, seemingly caught fire and started shining” (p. 82). This “ball” travelled through the part of the sky occupied by the aurora before being extinguished some five or six seconds later. Celsius was later informed that exactly the same phenomenon had been seen the same evening at another place in Sweden. Such *globi igniti* (ignited balls) or *dracones volantes* (flying dragons) may be useful for the calculation of longitudes, Celsius suggests, provided that the exact time of their emergence or disappearance is recorded (p. 82).

VOLUMEN QUARTUM Continens annos 1735. 1736. 1737. 1738 & 1739.

The Anni MDCCXXXV contains no article on the aurora borealis.⁷ In the Anni MDCCXXXVI, however, one paper lists several aurorae: **JOHANNIS SPARSCHUCH Observationes Meteorologicæ Lincopiæ habitæ A:o 1734. [& 1735.]** (Johan Sparschuch’s Meteorological Observations made in Linköping in the Year 1734 [and 1735]) on pp. 185–192. In total, he reports eighteen auroral observations over the two years. Each observation is usually characterized by means of a simple adjective, such as “weak” (*exiguum*), “faint” (*debilis*) or “obscure” (*obscura*), though some are singled out as “significant” (*insignis*), “more bright” (*illustrius*) or “bright, yet hindered by clouds” (*illustris nubibus tamen impedita*) (p. 189). Sparschuch uses the terms *aurora borealis*, *lumen boreale* and *Chasma boreale*, seemingly without any clear typology. Theoretical deliberations are avoided.

The Anni MDCCXXXVII includes three articles on the aurora, the first titled **Observationes nonnullæ circa Lumen Nocturnum Boreale, Upsaliæ ad finem Anni 1736 & initio sequentis habitæ à NICOLAO WALLERIO** (Numerous Observations of the Nocturnal Northern Light, made in Uppsala towards the End of the Year 1736 and in the Beginning of the Following Year), on pp. 220–229). In May 1736, Wallerius had published an 88-page dissertation on meteorology where he gave an overview of the theoretical foundations of the study of the weather. Using Conrad Quensel’s term *lumen nocturnum boreale*⁸ and referring also to Erik

⁷ However, in the comprehensive *Historia Eclipsos Solaris* (see footnote 2 above), one of the observers, the provost Petrus Rydhenius (1679–1741), states that: “the Sun, just as it was about to lose all light and also when it was about to regain it, threw out fluctuating rays, similar to those of an *aurora borealis*, and of a reddish hue” (p. 61).

⁸ See *Aurorae Borealis Studia Classica*, [vol. XIV](#).

Burman's theoretical deliberations published in the Acta of 1724,⁹ Wallerius touches upon the aurora on the very last page of his dissertation:¹⁰

§. CCXIX. All this being explained, it is easy to see that some meteorological phenomena (*meteora*) are produced by *effluvia* only, others by rays of light acting together with effluvia. The former we name *hypostatica*, or real meteora; the latter, *emphatica*, or apparent ones. The hypostatic meteora are generated either by effluvia of water (for the most part) (§. 126) or by effluvia that are inflammable (§. 128). For example, fog, clouds, dew, rain, frost, snow and hail we call *meteora hypostatica aqueae* [i.e., aqueous hypostatic meteorological phenomena], whereas meteora like lightning, thunder, sheet lightning, falling or wandering stars, dancing goats, the *ignis fatuus*, licking fire, etc. are *igneae* [i.e., igneous meteorological phenomena]. We do not, however, categorize the emphatic meteora into different species, but group them all together in one: rainbow, halo or corona, parhelion and paraselene.

§. CXXX. Until now, it is unclear whether the *Lumen Nocturnum Boreale*, that most frequent of meteora in our lands, is to be categorized as an igneous phenomenon or as an emphatic one. Perhaps we should follow our late Eric Burman, still a very famous man after he passed away, in defining this phenomenon partly as an igneous one, partly as an emphatic one, see *Acta Literaria Sveciæ*, Trimestre Tertium, Anni 1724. We do not come to a conclusion with these general statements, as the subject is too broad to be treated in a few sentences only.

The following autumn, Wallerius embarked upon a systematic study of the properties of the aurora. His report covers observations made on 21 different dates from 6 September 1736 until 17 February 1737. Wallerius differs from Celsius and others by not including thermometer or barometer measurements, although he occasionally mentions that “A shiny and clear day preceded the phenomenon. At night, cold set in, causing water to be covered in ice” (p. 221, on 13 September) or “This night, frost covered the ground; on the following day, there fell a lot of rain with floes of ice, [in Swedish] *ijsbark*” (p. 222, on 16 September). Wallerius' descriptions of the aurora as such are generally quite detailed, at times covering several pages in length (e.g., pp. 225–228, on 9 October). There is however no discussion of causes or theories, and the paper lacks both an introduction and a conclusion. The very last observation may serve as an example (p. 229, on 17 February):

At 7 o'clock in the evening, a very large *lumen* was seen. It had various rays, as usual. In the northeast, there was a very deep red disk; this suddenly rushed upwards to the zenith. Having arrived there, it took the form of a whitish matter that emitted short rays in various directions. In the north and northwest there were two bows, one above the other, consisting of thin rays. These paid no heed to the direction of the wind, but began moving in various directions. As they clashed into each other, they often displayed colours – deep red, green and violet.

Throughout his paper, Wallerius focuses on the visual properties of the aurora. He often compares the phenomena with other natural observations. For example, its movement can resemble “water spilling over into a flood” (p. 221) or its shape be “exactly like rainbows” (*ibid.*).

⁹ Presented in *Aurorae Borealis Studia Classica*, vol. XIII.

¹⁰ *Dissertatio physica, sistens meteorologiam generalem, quam, suffragio ampliss. facultatis philosophicæ in illustr. academ. Upsal. publicæ bonorum censuræ modeste subjiciunt*, auctor Nicolaus Wallerius, Erii fil. et respondens Arvidus Arvidi Roman, Nericius. *In audit. Gust. maj. ad diem 29 Maji, A.O.R. MDCCXXXVI. Horis ante meridiem solitis* (Upsaliae, [1736]), p. 88. [Digitized](#)

Furthermore, a bow can be “resembling in shape a major and quite dense flame” (p. 222–23). As regards its sound, Wallerius on 17 September 1736 reports that (p. 223):

At this point [i.e., shortly after 9 pm] I had to interrupt my observations because of other duties. I did, however, learn from others that this *lumen boreale* had reached its absolute maximum in the middle of the night, when it displayed various very shiny and flame-like pyramids that spread themselves throughout the entire sky, all the way from the horizon and up to the zenith. The same persons told me that they heard a hissing (*sibilus*) or whispering sound (*susurrus*), just as the said pyramids were thrown out at high speed and raced into each other. Personally, I have never observed any sound of this kind, yet I would not venture to deny its existence. Be that as it may, there can be no doubt that this phenomenon was very strong, for still at 4 am the entire north was seen burning, now elevating, now depressing its flame.

This is, in fact, the only mention of sound in the context of auroral observations in this entire decade of the Acta.

On pp. 249–254 of the Anni MDCCXXXVII issue one finds **Observationes Meteorologicæ habitæ Lincopiæ Anno 1736. à JOHANNE SPARSCHUCH** (Meteorological Observations made in Linköping in the Year 1736 by Johan Sparschuch). The thirteen observations are usually described by a single adjective, such as “obscure” (*obscura*), “indistinct” (*indistincta*), “rather strong” (*satis insignis*). Puzzlingly, however, Sparschuch on two occasions says that an aurora is “rather strong, but due to rather dense clouds it could not be observed” (p. 252, on 24 August) or “inobservable due to clouds” (p. 253, on 16 October). How he managed to observe aurorae that were not observable is unclear.

The Anni MDCCXXXVII continues with a set of **Observationes de Lumine boreali ad Circulum polarem habitæ ab ANDREA CELSIO** (Observations of the *Lumen boreale* made at the Arctic Circle by Anders Celsius), on pp. 254–262. The 47 observations were made by Celsius during his expedition with Maupertuis to the Tornedalen Valley in far-northern Sweden, where they examined the shape of the Earth. The auroral observations span virtually the same period as Wallerius’ observations in Uppsala, from 20 September 1736 to 11 April 1737. Like Wallerius’ paper, this report by Celsius lacks theoretical deliberations. Movements, positions in the sky, colours etc. are described in some detail on several occasions, although one also finds certain rather nude records (p. 255):

17th October, in the town of Torneå [i.e., Tornio, Haparanda].
At 8 pm, a *Lumen boreale*.

18th October, the same place.
In the evening and night, a *lux borealis*.

Celsius’ more elaborate descriptions are of auroral outbreaks that exhibit unusual colours or movements. The observation made on 1 December 1736, between *Övertorneå* and *Torneå* (in

Finnish, Ylitornio and Tornio), is not only quite specific regarding the properties of the aurora observed, it also draws upon the experience of local informants (pp. 255–256):

Having halted our travel, between 7 and 8 pm in the evening, I noticed that the sky was illuminated, first in the southeastern region close to the star of Saturn, thereafter in the southwest. The colour of the light was a constant and pure deep red, seemingly with no other colour mixed with it, as if the sky had been adorned by a scarlet carpet. This *lumen* consisted of numerous deep red rays that were running squarely in a right angle to the horizon and whose lowermost edges were rather white.

At 9 pm the entire Orion was dressed in a purpur toga. In the meantime, a whitish bow lit up the south, and all the while the rare *lumen* played around in the north and the entire sky with different forms and colours. Last but not least, the Moon was shining very brightly, in order that no element that could contribute to the majestic splendour of the night sky should be wanting. Its face was only half, however, so that it did not appear to spoil the weaker light of either the stars or the northern flashes [*coruscationes boreales*]. My charioteer, a Finn living by the banks of the Torne River [i.e., Torneälv, Tornionjoki], admired together with me the phenomenon, which he considered unusual. Also a Sámi from Jukkasjärvi claimed that this deep red colour was extremely rarely seen; this could only be an omen signalling war and bloodshed, he said. He had come to see me because he was interested in meeting me as the author of almanacs, which he was capable of reading.

A single article in the Anni MDCCXXXVIII mentions the aurora: **Observationes Meteorologicæ Lincopiae habitæ annis 1737 & 1738. à JOH. SPARSCHUCH** (Meteorological Observations made in Linköping in the Years 1737 and 1738), on pp. 435–443. In total, 26 observations are recorded over the two years. Many of these are “faint” (*debilis*) or “languid” (*languida*), some are “bright” (*insignis*) or similar, but there are also some without any description whatsoever.

In the Anni MDCCXXXIX, there is only one article mentioning the aurora borealis: **Observationes Meteorologicæ habitæ Upsaliæ Anno 1739 Ab AND. CELSIO** (Meteorological Observations made in Uppsala in the Year 1739 by Anders Celsius), on pp. 539–547. Nearly exactly half the article – four full pages – consists of auroral observations. The observations are listed chronologically, according to month and date. Altogether 44 observations were made, distributed across all the months of the year except June.

The account is dry and brief, focusing on the visual properties of the phenomenon. Theoretical deliberations are lacking. One of the longest descriptions may serve as an example (p. 544, on 1 March 1739):

A *lumen boreale* formed a rather bright arch between 7 and 9 pm in the evening, 35 degrees high and rising upwards from the northeast. In addition, there were other arches reaching all the way up to the Zenith. Around 10 pm the light was very strong and coloured, especially in the northwestern region; afterwards, perpendicular and very mobile rays adorned the Zenith with a crown. The *lumen* was still ongoing at midnight.

Only one of the 44 instances reported by Celsius 1739 contains a remark about the weather: “During this entire time [i.e., as long as the phenomenon lasted] a wind blew from the southwest, strength three” (p. 544, on 23 February).

The general absence of remarks about weather conditions before, after or during auroral observations in the reports from the latter half of the 1730s may be expressions of a significant shift in research approach. While still being listed among the *Meteora* (meteorological phenomena) in Celsius’ very last meteorological reports from Uppsala, the northern lights appear to have stood on the brink of becoming an object of research in their own right, separate from meteorology. The two articles on the physical properties of multiple auroral outbreaks – by Wallerius and Celsius in the *Acta Anni 1737* – are especially noteworthy. They contrast to Celsius’ own treatise from 1733 (see *Aurorae Borealis Studia Classica*, [vol. XV](#)), where the weather conditions accompanying the aurora was given close attention.

As for terminology, one notices that a variety of synonyms are in use. The terms used by Celsius, Spöring, Hof, Sparschuch, Hallman and Wallerius in this decade of the *Acta* are *aurora borealis*, *lumen* or *lumen boreale* (in the plural, *lumina borealia*) or even *lumen nocturnum boreale*, *lux borealis*, *coruscationes boreales*, *c[h]asma* or *Chasma boreale* (plur., *Chasmata borealia*).