

Aurorae Borealis Studia Classica

Vol. V

*Historische Demonstration und Anmerckung
über die Eigenschafften und Ursachen
des so genandten Nord-Lichts
(1724) / (1728)*

by Jens Christian Spidberg

digitized by UiT, with a biographical introduction
and summary of contents by Per Pippin Aspaas

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Copy of *Historische Demonstration und Anmerckung über die Eigenschafften und Ursachen des so genandten Nord-Lichts* from the Ultima Thule Collection of the University Library, UiT The Arctic University of Norway (see [e-book](#))

Pages from *Supplementum II. Curieuser und Nutzbarer Anmerckungen von Natur- und Kunst-Geschichten, Durch eigene Erfahrung und aus vielerley Correspondence gesammelt von Johanne Kanoldt* from the Bayerische Staatsbibliothek in Munich, Call Number 7411782 4 Acad. 43-38,b,1/4 7411782 4 Acad. 43-38,b,1/4 (see e-book, [extract 1](#) and [extract 2](#))

Pages from the *Nye Tidender om lærde og curieuse Sager* (20 February 1738), courtesy of the Royal Library of Copenhagen (see [digitized article](#))

JENS CHRISTIAN SPIDBERG (1684–1762)

Biographical introduction by Per Pippin Aspaas

Jens Christian Spidberg was born on 8 December 1684 in Skiptvedt in the county of Østfold in Norway (then Smaalenene in the Kingdom of Denmark and Norway). A pastor's son, he was largely educated in his own home up to the degree of theology, which he passed in Copenhagen in 1708. He thereafter served as a chaplain to the forces patrolling the border area between Sweden and Denmark-Norway, from Bohuslän to Trøndelag, in 1711–1715. The next couple of years, he visited the universities of Kiel and Groningen, before serving for several years as a vicar to the marine forces. In 1721, however, he was appointed a vicar in Kristiansand (Christiansand) in Agder in southernmost Norway, where he remained in the service of the church, rising through the ranks until he became appointed a bishop in 1759, not long before his death in April 1762.

Spidberg has been characterised as one of the most, possibly the most important figure in Norwegian natural history before the arrival of bishop Johan Ernst Gunnerus to Trondheim in 1758 (Nissen 1962). He was well read in the natural sciences and produced works on meteorology, earthquakes, whirlpools and tsunamies, as well as theology, history and runology; he also made several maps. Spidberg patriotically pleaded the case of Norway as an ideal place for research into natural phenomena, such as the aurora borealis. Like several other Scandinavian natural philosophers, Spidberg was piqued by the *Traité physique et historique de l'Aurore boréale*, published by Jean-Jacques Dortous de Mairan in 1733. “Had M. de Mairan taken care to procure from Norway, some accurate observations on the Aurora Borealis, his valuable *Traité Physique de l'Aurore Boreale*, had been much more complete and decisive; for the north light takes its rise from Norway, and particularly from the diocese of Drontheim”, he famously stated, in a letter quoted in the introduction to the first *Natural History of Norway* (published in 1752–53 by the Bergen-based theologian Erik Pontoppidan, here quoted from the Eng. transl., 1755, p. xv – see further *Aurorae Borealis Studia Classica*, vol. VII).

Most of Spidberg's manuscripts and books were consumed in a fire devastating large parts of Kristiansand in 1734. Little survives of his earlier writings, apart from the booklet presented here, *Historische Demonstration und Anmerckung über die Eigenschafften und Ursachen des so genandten Nord-Lichts* ('Historical Demonstration of, and Commentary on, the Properties and Causes of the so-called Northern Light', Halle 1724). Contrary to most scientific papers on the aurora that were published in early eighteenth-century Europe, it does not deal with any singular, unusually spectacular auroral outbreak. Rather, it conveys Spidberg's concept of the phenomenon based on continuous observations of numerous aurorae, systematically conducted over a two-year period. Exactly when he had compiled his set of recurring observations is not stated anywhere in the book, but one commentator (Truls Lynne Hansen) conjectures that the observations probably took place while the author served as an army chaplain in southern and middle parts of Norway, i.e., between 1711 and 1714.

It is not known to what extent Spidberg contributed to contemporaneous journals and newspapers. His *Historische Demonstration* was, however, reprinted in a four-volume compilation of articles on physics, astronomy, medicine and related subject matters, edited by the medical doctor and member of the *Naturae Curiosorum Academia* of Breslau in Silesia (now Wrocław in Poland), Johann Kanold: the *Supplementum Curieuser und Nutzbarer Anmerckungen von Natur- und Kunst-Geschichten*, 4 vols., 1726–29). Spidberg's *Historische Demonstration* is included in the second volume, published in Budißin (Bautzen in Germany) in 1728. This reprint is accompanied by an introductory article by the editor Kanold. Another text on the aurora by Spidberg is his contribution to the Copenhagen weekly, *Nye Tidender om lærde og curieuse Sager*, 8 February 1738. This text deals with an aurora observed in Kristiansand on 16 December 1737.

Along with Heinzelmann's first edition of 1724, the 1728 reprint and Kanold's accompanying article, Spidberg's newspaper article in *Nye Tidender om lærde og curieuse Sager* is included in this issue of *Aurorae Borealis Studia Classica*.

Bibliography

Hansen, Truls Lynne: "En prest om nordlyset – Jens Spidbergs skrift fra 1724", in Marie-Theres Federhofer & Hanna Hodacs (eds.), *Mellom pasjon og profesjonalisme: Dilettantkulturer i skandinavisk kunst og vitenskap*, Trondheim: Tapir akademisk forlag, 2011, pp. 92–102.

Nissen, Kristian: "Jens Christian Spidberg", in *Norsk Biografisk Leksikon* vol. XIV, Oslo: Aschehoug, 1962, pp. 242–247.

HISTORISCHE DEMONSTRATION UND ANMERCKUNG ÜBER DIE EIGEN- SCHAFFTEN UND URSACHEN DES SO GENANDTEN NORD-LICHTS

Summary of Contents (first edition)

by Per Pippin Aspaas

Spidberg's own text fills less than thirty pages. In addition, the booklet includes one illustration, a dedication and foreword by the publisher Johann Bernhard Heinzelmann, as well as an advertisement for other titles for sale. The foreword explains that the original manuscript was in "Norwegian", but only the printed German version appears to have survived. Reference to page numbers in the 1728 reprint by Johann Kanold (hereafter referred to as **RE**) are included [in brackets].

[Title page], [Illustration] & [Dedication] (pp. [i]–[x])

Full title: *Herrn M[agister] Jens Christian Spidbergs, wohl meritirten Probsts zu Christians-Sand in Norwegen historische Demonstration und Anmerckung über die Eigenschafften und Ursachen des so genandten Nord-Lichts der gelehrten und curieusen Welt zum Urtheil und Vergnüen mitgetheilet von Joh[ann] Bernhard Heinzelmann* ('Historical Demonstration of, and Commentary on, the Properties and Causes of the so-called Northern Light by Herr Magister Jens Christian Spidberg, highly merited provost in Christiansand in Norway. Communicated to the assessment and pleasure of the world of learning and curiosity by Johann Bernhard Heinzelmann', Halle 1724). The editor's name is not only conspicuous on the title page, he has also composed a six-page dedication to Christian Friedrich von Hollstein (i.e., Christian Fredrik Holstein af Cathrineberg), dated Halle 16 April 1724. The dedication does not deal with the aurora borealis, but is an expression of Heinzelmann's lasting loyalty and gratitude to Holstein, in whose house he lived and served a few years earlier. The illustration is highly likely an engraving based on a drawing in Spidberg's own hand. It shows the rays of the sun being refracted and bent inwards above the northernmost regions of the Earth, a vivid expression of Spidberg's theory.

An dem geehrten Leser [Preface] (pp. [1]–[2]) [*summarized in RE, 67*]

“To the honoured reader”, a preface by the editor Johann Bernhard Heintzelmann (JBH), whose brother lives in Scandinavia. The said brother¹ has received the manuscript from Spidberg, translated it from the original “Norwegian” language into German, and dispatched it to JBH, who in turn has prepared it for publication. JBH has not asked for permission from Spidberg to publish the book (or so he claims), but he expects the author’s pardon nonetheless, based on their friendship from former times, when they both lived in Copenhagen.

§ I. Phænomena (pp. [3]–6) [=RE, 68–69]

The opening chapter lists altogether ten “phenomena”, or general remarks by the author. Translated into English, they are as follows:

Phenomenon I: “The aurora borealis never appears in the sky earlier than one hour after the day has ended. Likewise, it always ends one hour before daybreak.”

Phenomenon II: “It is impossible to gain sight of the aurora borealis without a clear sky, for as soon as clouds appear, the aurora disappears.”

Phenomenon III: “When more than six days have passed since the new moon, the aurora borealis is rarely seen until the moon has gone down. Moreover, the very moment when the full moon rises in the night sky, the aurora becomes invisible, even if it has been sighted earlier the same evening.”

Phenomenon IV: “The beginning of an aurora manifests itself in the evening, as a hazy cloud in the northeastern sky. Its upper parts ascend like white smoke, and all the while, it presents itself as a semi-circle or rainbow, which, however, does not rise above ten degrees from the horizon. The longer one beholds this semi-circular, white band of fragrance [sic], the clearer will it appear to the eye, until it displays its entire self, with a shiny, bright silver-lustre in its uppermost parts. The closer it gets to midnight or morning, the more will this semi-circular fragrance turn towards the north and, after that, towards the north-west, and all the while will its periphery disappear.”

Phenomenon V: “Occasionally, this semi-circular light stays regular the entire night, in case there is a completely clear sky and a lack of wind. As soon as a wind rises, it will begin to emit bright rays, which in turn will spread themselves across ever larger parts of the north sky, where they will turn into various notable figures, such as men, armies, ships, houses, mountains, swords, and so forth. As a result, anyone gifted with the imagination of a Don Quixote will there be able to see whatever he wishes to imagine. What a philosopher on such an occasion observes, calmly and with much delight, will fill the superstitious common folk with fear and astonishment.”

¹ According to Nicolai Wergeland, *Christiansands Byes Beskrivelse* (posthumous edn., 1963, p. 369) the name of this brother was Johann Gottfried Heintzelmann, who had lived in Kristiansand from 1721 to 1723 as a private teacher in the home of a magistrate.

Phenomenon VI: “If a storm or strong wind arises during the night, at a time when the sky is clear, is the aurora rarely seen.”

Phenomenon VII: “This light should, in itself, be regarded as thin, clear bands of cloud, which, however, are transparent at all times, so that each and every star can be perceived through it.”

Phenomenon VIII: “The aurora borealis rarely rises as high as the Tropic of Cancer, and never above it. Further, the closer it comes to the Tropic, the weaker its light becomes.”

Phenomenon IX: “The farther north one travels, the clearer the aurora becomes. I have myself observed a considerable difference in Norway, between Christiania [Oslo] at 59 degrees 28 minutes North and Trondheim at 64 degrees, and from various northern travelogues we learn how bright it is between the 70th and 80th degree North.”

Phenomenon X: “The common folk make up many a foreboding or miraculous sign from the aurora borealis. If nothing else, they at least interpret it as a sign of the weather and the seasons to come. I have, however, on the basis of observations that I eagerly assembled over a two-year period, been able to ascertain how false and misleading such notions are. Even by the strongest, rarest and most conspicuous auroral outbreaks was I unable to find any other effect than, on some occasions, cold and frost; on others, rainy or dry weather; storm and wind every now and then, as well as the occasional calm weather – all this without any regularity or fixed pattern.”

§ II. Hypothesis cl[arissimi] autoris (pp. 7–31) [=RE, 69–80]

“The highly praiseworthy author’s hypothesis”. Spidberg claims that very few authors have tried to explain the cause of the phenomenon. He refers, however, to various physicists, above all to Descartes. In contrast to the Cartesian theory, Spidberg argues that the aurora is likely to originate from frozen ice crystals floating around in the air above the northern regions: “[...] the aurora borealis is nothing but innumerable particles of snow and ice assembled in the air, which are illuminated by the rays of the sun as a result of the reflection and refraction. These are sent back and forth high up in the air, leaving behind this rare sight to us on the Earth” (p. 9 = RE, 71). According to Spidberg, the phenomenon only occurs when the sun is below the horizon and the sky is dark and clear; furthermore, the moonlight should be feeble enough to avoid lighting the sky to such an extent that the aurora becomes invisible. After a detailed discussion of basic literature on physics and optics, Spidberg returns to his ten “Phænomena” and explains them according his physico-optical theory (pp. 26–30 = RE, 78–80).

Bey dem Verleger dieses tractats ist ferner zu haben (pp. 31–32)

“At the publisher of this treatise [i.e., Johann Adam Spörl in Halle] the following titles are also available”. Advertisement listing several books, none of which deals with the aurora borealis.

HISTORISCHE DEMONSTRATION UND ANMERCKUNG ÜBER DIE EIGEN- SCHAFFTEN UND URSACHEN DES SO GENANDTEN NORD-LICHTS

Summary of Contents (1728 reprint)

by Per Pippin Aspaas

Spidberg's text was reprinted in the journal *Supplementum Curieuser und Nutzbarer Anmerkungen von Natur- und Kunst-Geschichten, Durch eigene Erfahrung und aus vielerley Correspondence gesammelt von Johanne Kanoldt* ('Supplement to the Interesting and Useful Commentaries on Natural- and Art History. Compiled, using his own experience and widespread correspondence, by Johann Kanoldt' vol. II, 1728). At the beginning of the reprint, the editor Kanoldt includes a brief foreword summarizing information found in the original preface by Johann Bernhard Heinzelmann (p. 67). Kanoldt's reprint does not, however, include the illustration of the phenomenon found in the first edition. Reference to page numbers in the first edition by Johann Bernhard Heinzelmann (hereafter referred to as **JBH**) are included [in brackets].

[Title] & [Preface] (p. 67) [=JBH, (1)-(2)]

The title is identical to the first edition. The preface is a brief summary of information found in the original preface by Johann Bernhard Heinzelmann.

§ I. Phænomena (pp. 68–69) [=JBH, (3)–(6)]

The opening chapter lists altogether ten "phenomena", or general remarks by the author. Translated into English, they are as follows:

Phenomenon I: "The aurora borealis never appears in the sky earlier than one hour after the day has ended. Likewise, it always ends one hour before daybreak."

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full moon rises in the night sky, the aurora becomes invisible, even if it has been sighted earlier the same evening.”

Phenomenon IV: “The beginning of an aurora manifests itself in the evening, as a hazy cloud in the northeastern sky. Its upper parts ascend like white smoke, and all the while, it presents itself as a semi-circle or rainbow, which, however, does not rise above ten degrees from the horizon. The longer one beholds this semi-circular, white band of fragrance [sic], the clearer will it appear to the eye, until it displays its entire self, with a shiny, bright silver-lustre in its uppermost parts. The closer it gets to midnight or morning, the more will this semi-circular fragrance turn towards the north and, after that, towards the north-west, and all the while will its periphery disappear.”

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§ II. Hypothesis clarissimi auctoris (pp. 69–80) [=JBH, 7–31)

“The highly praiseworthy author’s hypothesis”. Spidberg claims that very few authors have tried to explain the cause of the phenomenon. He refers, however, to various physicists, above all to Descartes. In contrast to the Cartesian theory, Spidberg argues that the aurora is likely to originate from frozen ice crystals floating around in the air above the northern regions: “[...] the aurora borealis is nothing but innumerable particles of snow and ice assembled in the air, which are illuminated by the rays of the sun as a result of the reflection and refraction. These are sent back and forth high up in the air, leaving behind this rare sight to us on the Earth” (p. 71 = JBH, 9). According to Spidberg, the phenomenon only occurs when the sun is below the horizon and the sky is dark and clear; furthermore, the moonlight should be feeble enough to avoid lighting the sky to such an extent that the aurora becomes invisible. After a detailed discussion of basic literature on physics and optics, Spidberg returns to his ten “Phænomena” and explains them according to his physico-optical theory (pp. 78–80 = JBH, 26–30).

UNVORGREIFFLICHE GEDANCKEN VON DENEN URSACHEN DER ENT- STEHUNG DES SO GENANNTEN LUMINIS BOREALIS

Summary of Contents (article by J. Kanold)
by Per Pippin Aspaas

The 1728 reprint is preceded by an article by the editor, Johann Kanold (or Kanoldt, 1679–1729). Its full title is “Unvorgreifliche Gedancken von denen Ursachen der Entstehung des so genannten Luminis Borealis, insonderheit auf Veranlassung der ohnlängst ans Licht getretenen Historischen Demonstration und Anmerckung über die Eigenschafften und Ursachen des Nord-Lichts Herrn M. Jens Christian Spidbergs wohl-meritirten Probsts zu Christians-Sand in Norwegen entworffen” (‘Open-minded thoughts regarding the causes and origin of the so-called Lumen Boreale, occasioned primarily by the recently published Historical Demonstration of, and Commentary on, the Properties and Causes of the so-called Northern Light by Herr Magister Jens Christian Spidberg, highly merited provost in Christiansand in Norway’, pp. 51–67). In this article, Kanold discusses the essentials of Spidberg’s theory in light of his own observations from Silesia as well as reports and theories on the phenomenon that had been put forward by others.

Kanold explains that he has published an earlier article on the aurora in 1721 (p. 52). After a brief account of existing theories regarding the cause of the aurora (pp. 52–54), Kanold compliments Spidberg on the difficulty of his topic, “which may well belong to the category of natural phenomena whose true causes hardly lend themselves to be thoroughly explored, nor comprehensively explained, by our generation” (pp. 54–55). Kanold then lists altogether 29 auroral observations that he himself has made, from 17 March 1716 to 9 January 1725 (pp. 55–57). Based on the details of these observations, plus eyewitness accounts from Spitsbergen and Greenland, he proceeds to a critical assessment of Spidberg’s theory (pp. 57–67). “The material cause of the aurora borealis is therefore, according to my conjecture, nothing else than an outbreak of fervid and sulphureous exhalations, occasioned by a particular agitation or excitation of the central fire of the earth. These exhalations take place close to, or at, the earth’s Arctic Pole on special occasions”, Kanold concludes (p. 65).

CHRISTIANSAND I NORGE DEN 30 JAN. 1738

Summary of Contents (newspaper article) by Per Pippin Aspaas

On 16 December 1737, an unusually strong auroral outbreak was observed in Hamburg. Upon reading news about this observation, Jens Christian Spidberg wrote a letter to the editor of the influential Copenhagen weekly, *Nye Tidender om lærde og curieuse Sager* ('News regarding learned and interesting subject matters', No 8, Den 20 Februarii 1738, pp. 116–118). The letter is dated "Christiansand i Norge [i.e., Kristiansand in Norway] den 30 Jan. 1738" and contains Spidberg's own observation of the above-mentioned aurora, along with his deliberations regarding its cause.

Spidberg recounts how the phenomenon began around 6 pm and lasted until the sky became covered by clouds shortly before 10 pm; when the clouds lifted around 5 am the next morning, the phenomenon was sighted again by the city guardians. The aurora filled the sky with a bright red colour, leading many beholders to mistake it for the glow of some huge fire in the countryside outside the city. In an effort to explain the conspicuous red appearance, so rarely seen in Christiansand, Spidberg points to the study of de Mairan [i.e., the *Traité physique et historique de l'aurore boréale*, 1st edn. 1733] and surmises that the hue of this particular aurora was caused by the Zodiacal light.