

Aurorae Borealis Studia Classica

Vol. VII

The aurora borealis as described in

Norges Naturlige Historie (1752)
Natürliche Historie von Norwegen (1753)
Natural History of Norway (1755)

by Erich Pontoppidan

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

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ERICH PONTOPPIDAN (1698–1764)

Biographical introduction by Per Pippin Aspaas

Erich (Erik, Ericus) Pontoppidan was born in Aarhus, Denmark in 1698 and died in Copenhagen in 1764. He is primarily remembered as a theologian and the author of an explanation of Martin Luther's Catechism, first published in 1737 and serving as compulsory reading for the instruction to the Christian faith in Denmark and Norway for many decades thereafter. From 1746 to 1754, Pontoppidan lived in Norway, during which time he travelled extensively in western parts of the country as bishop of the diocese of Bergen. Along with several members of the Norwegian clergy, he belonged to a current of awakening interest in the study of nature in the north. However, with the exception of Johan Ernst Gunnerus, who served as bishop in Trondheim from 1760 onwards, few members of this 'awakening' published comprehensive works comparable to the grand *Natural History of Norway*.

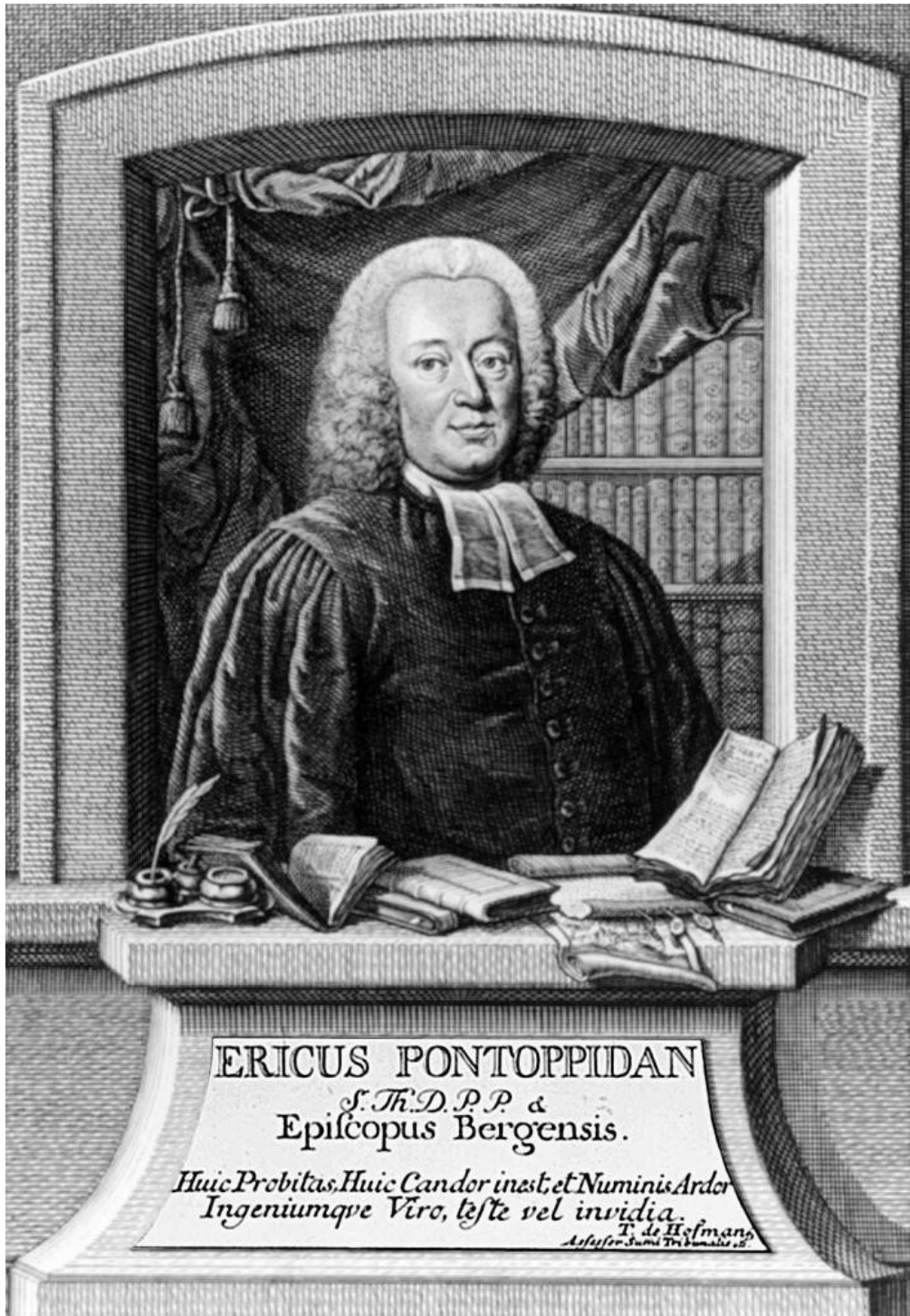
Pontoppidan produced many works throughout his career, in Danish, Latin, and German. His titles include contributions to history, theology, philosophy, linguistics, topography, statistics, agriculture – and even a novel, a fictitious travel account. He was a full member of the Royal Danish Society of Sciences from its inception (in 1742), founder and editor of the utilitarian journal *Danmarks og Norges Oeconomiske Magazin* (1757–1764) and pro-chancellor of Copenhagen University (appointed 1755).

A standard reference work by a revered author, Pontoppidan's two-volume natural history had a wide readership. Following the original, Danish edition, German and English translations followed in quick succession. The work is characteristic of Pontoppidan's broad interests and his ability to assemble and summarize information from a variety of sources. The aurora borealis figures in the book's preface and it is also the subject of an elaborate discussion in one of its chapters. Although he quotes his senior colleague, Jens Christian Spidberg (see *Aurorae Borealis Studia Classica*, [vol. V](#)) in favourable terms, he does not support his theory on the aurora as the reflection of sunbeams in ice crystals high in the atmosphere. With considerable caution, Pontoppidan instead leans towards an electricity theory, one of several 'schools of thought' regarding the aurora during the eighteenth century.

Bibliography

Austad, Torleif: “Erik Pontoppidan 2”, in *Norsk biografisk leksikon*, online at https://nbl.snl.no/Erik_Pontoppidan_-_2 (last updated 13 February 2009)

Ehrencron-Müller, H. “Pontoppidan, Erik Ludvigsen”, in *Forfatterlexikon omfattende Danmark, Norge og Island indtil 1814*, vol. VI (1929), pp. 321–336.



Portrait of Erich Pontoppidan from 1749. Public Domain.

NORGES NATURLIGE HISTORIE

Summary of Contents pertaining to the Aurora Borealis (Danish edition) by Per Pippin Aspaas

The two-volume “Natural History of Norway” is a comprehensive description of the natural phenomena, wildlife and inhabitants of Norway. The early-modern term natural history included meteorology and geophysics, and even ethnography and folklore. It is in the very first chapter of the first volume, describing “the air [i.e. climate] of Norway”, that a detailed description of the aurora borealis is found. The same phenomenon is also highlighted in the Preface.

All parts of Pontoppidan’s *Norges Naturlige Historie* that pertain to the aurora borealis are included in this volume. Reference to other contemporaneous editions – namely, the German edition by Johann Adolph Scheibe (hereafter referred to as GER) and the anonymous English edition (ENG) – is found in [brackets]; the editions in question are also summarized separately below.

All quotations have been translated into English by the author of this summary.

[Title page], Fortale, & Indhold (no pages) [= GER, (1), 26–53, (54)–(62)]; ENG, (i)–(xxi)]

Full title: *Det første Forsøg paa Norges Naturlige Historie, forestillende dette Kongeriges Luft, Grund, Fielde, Vande, Væxter, Metaller, Mineralier, Steen-Arter, Dyr, Fugle, Fiske og omsider Indbyggernes Naturel, samt Sædvaner og Levemaade. Oplyst med Kobberstykker. Den viise og almægtige Skaber til Ære, saavel som hans fornuftige Creature til videre Eftertankes Anledning* (“The first attempt at the natural history of Norway, presenting the air, soil, mountains, waters, plants, metals, minerals, stones, animals, birds, and fish of the Kingdom and, lastly, the character of the inhabitants as well as their habits and way of life. Illustrated by copper prints. To the honour of the wise and almighty Creator, and as occasion for further reflection by the creature of reason”). The author’s own Preface (“Fortale”,

altogether 34 unpaginated pages) and Table of Contents (“Indhold”, two pages) provide details about the aims and scope of the work and its overall structure.

Of particular interest regarding the aurora is a lengthy quotation from Pontoppidan’s colleague, Jens Chr. Spidberg in Christiansand (Kristiansand) [*no pages* = GER, 45–48; ENG, xiv–xvii]. Spidberg – whose extant writings on the aurora are included in [Vol. V](#) of *Aurorae Borealis Studia Classica* – argues in a letter to the author that European science would have benefited from empirical data from the farthest north. Pierre Louis Moreau de Maupertuis, who found evidence for the shape of the Earth by measuring a degree of meridian in the Tornedal Valley (northernmost Sweden) in 1736–37, would according to Spidberg have found more accurate evidence by travelling even farther north, to the Norwegian region of Finnmark. Similarly, the widely read *Traité Physique et Historique de l’Aurore Boréale* (1733) by the French natural philosopher Jean-Jacques Dortous de Mairan would have become a far more reliable book if only he had conducted his research in the Kingdom of Norway, since “Norway, and in particular the diocese of Tronhiem, is the homeland of the Northern Lights” [*no page* = GER, 46; ENG, xv].¹

Det første Capitel. Om Luften, og det som deri ytrer sig (pp. [1]–56) [= GER, (3)–64; ENG, (1)–34]

“The first chapter. On the air, and that which expresses itself therein”.

In §§. 1–2 of the chapter, Pontoppidan confesses that he has little personal experience with regions inside the Polar Circle [p. 3 = GER, 4; ENG, 2]. Nevertheless, he does describe the polar winters of the far north, during which time “a dim dusk, lasting for about one and a half hours” constitutes the only ‘daylight’ [p. 6 = GER, 9; ENG, 4]. It is in this context that he introduces the Aurora Borealis, which often glows so bright as to facilitate outdoor activity [pp. 6–7 = GER, 9; ENG, 4].

§. 3 deals with the Aurora Borealis as well as the so-called *morild*, or luminescence of the sea at night.

According to a lengthy quotation from a work by Johan Heitman (*Physiske Betænkninger over Solens Varme, Luftens skarpe Kuld og Nord-Lyset*, 1741), the aurora originates from salty matter (“salpeteragtige Dunster”, or vapours resembling potassium nitrate) evaporating from the sea during certain climatic conditions. Heitman places the aurora in the same

¹ Tronhiem (or Nidaros, now Trondheim) was at that time the northernmost administrative part of Norway, reaching all the way up to the North Cape and the Russian border. By singling out two of the most influential exponents of French science for criticism, Spidberg stakes his claim that first-hand experience with natural phenomena trumps theoretical ingenuity. The quality of observations, in turn, hinges on the geographical area in which they are recorded.

category as *morild*, which only takes place when the sea is stirred at night and is never witnessed in sweet water [pp. 8–11 = GER, 10–14; ENG, 5–7].

Pontoppidan further mentions theories of the aurora as related to lightning, a phenomenon which allegedly also has to do with sulphurous matter in the air, except that in the case of an aurora no thunder accompanies it. As an example of this school of thought, Pontoppidan quotes Nicolaus Börner (*Physica, oder Vernünfftige Abhandlung natürlicher Wissenschaften*, 1742), who in turn cites [Christian] Wolff [p. 11 = GER, 14; ENG, 7]. In support of this ‘lightning-without-thunder’ theory are reports that Pontoppidan have heard from “one or two friends in this country”, who “have assured me that these *fulgura spuria* [‘false lightnings’] are not always absolutely devoid of bang and noise, since they often, in quiet weather conditions during a strong aurora have heard an audible howling and even creaking in the air, not unlike the sound of ice as it cracks and gives in” [p. 11 = GER, 14–15; ENG, 7].

Pontoppidan is less inclined to believe in theories of the aurora being caused by volcanos supposedly situated beyond Greenland [pp. 11–12 = GER, 15; ENG, 7].

According to a theory that Pontoppidan finds more plausible, the aurora takes place when clouds high in the atmosphere of the polar regions are lit up by the rays of the sun from below the horizon. Pontoppidan here quotes Georg Venzky (or Venzki, *Vermischte Anmerkungen*, 1747–) and [Leonhard] Euler (“Recherches Physiques sur la cause de la queue des comètes, de la lumière boréale, et de la lumière zodiacale”, 1746/48) [p. 12 = GER, 15–16; ENG, 7–8].

Finally, on pp. 13–19 Pontoppidan introduces the theory to which he himself, albeit with considerable caution, adheres. “If I were to present my own opinion about this problematic phenomenon [...], it would be that it is reasonable to imagine that the aurora should appear as a result of electricity in the atmosphere. It is present everywhere and at all times, but only visible to our eyes under certain circumstances” [p. 13 = GER, 16; ENG, 8]. As foundation for his theory, Pontoppidan refers to a French collection, *Bibliothèque Britannique* (Tome 21, Part 2, 1743), detailing British laboratory experiments on electricity. Among the works rehearsed in that volume is the article “Some Conjectures concerning Electricity, and the Rise of Vapours” by [John Theophilus] Desaguliers. Pontoppidan quotes Desaguliers’ work in French translation on pp. 14–16 [= GER, 17–19; ENG, 8–10]. The article by Desaguliers explains how evacuated glass tubes can emit light when rubbed by a hand (i.e., static electricity). Vapours in the air, Desaguliers argues, can be electrical as well, at least under certain atmospheric conditions. Along this line of reasoning Pontoppidan argues that the air itself is comparable to a glass tube, with electric light (i.e., Aurora Borealis) occurring under

favourable conditions. Various properties of the phenomenon are easy to reconcile with this theory, Pontoppidan argues [pp. 16–19 = GER, 19–22; ENG, 10–11].

As a sequel to the discussion of the state-of-the-art in contemporaneous auroral research, Pontoppidan touches upon the folklore of former times. In the previous century, the aurora appears to have been observed more rarely, a circumstance that contributed to the spread of superstitious beliefs, he conjectures [p. 19, including footnote continued on p. 20 = GER, 22–23 (with footnote on continued on p. 24); ENG, 12].

The rest of the chapter deals with the winter climate and its influence on society (§. 4–8), followed by similar descriptions of the summer climate (§. 9–11), precipitation (§. 12–15), and winds (§. 16).

References to literature on the Aurora Borealis in the Danish edition

[Spidberg's letter in the Preface] “Monsr. De **Mairan** ... *Traité Physique de l'Aurore Boreale*” = Jean-Jacques Dortous de Mairan, *Traité Physique et Historique de l'Aurore Boréale* (Paris, 1733)

[Spidberg's letter in the Preface] “Von dem Nordlicht” = Jens Christian **Spidbergs** *Historische Demonstration und Anmerckung über die Eigenschafften und Ursachen des so genandten Nord-Lichts* (Halle, 1724) [see *Aurorae Borealis Studia Classica*, [vol. V](#)]

[p. 7] “Justice-Raad J. F. **Ramus** ... in Actis Societatis Hafniens. Tom. I. No. IX og Tom 3. No. VI.” = Joachim Frederik Ramus, “Historisk og physisk Beskrivelse over Nordlysets forunderlige Skikkelse, Natur og Oprindelse”, in: *Skrifter, som udi det Kiøbenhavnske Selskab af Lærdoms og Videnskabers Elskere ere fremlagte og oplæste*, vol. I (1743), pp. 317–396 & vol. III (1747), pp. 147–212 [Latin edition: Joachimi Friderici Rami “Historico-Physica enarratio de stupendis Luminis Borealis phoenomenis, natura et origine”. In: *Scriptorum a Societate Hafniensi bonis artibus promovendis dedita Danice editorum, nunc autem in Latinum sermonem conversorum* Pars Prima (1745), pp. 317–394 & Pars Tertia (1747), pp. 209–272]

[p. 8] “Søe-Captaine Joh. **Heitman** ... om Solens Varme etc. saavel som om Nord-Lyset” = Johan Heitmans *Physiske Betænkninger over Solens Varme, Luftens skarpe Kuld og Nord-Lyset* (Kjøbenhavn, 1741)

[p. 11] “Doct. Nicol. **Borners** Physica Cap. XI. Pag. 284” = D. Nicolai Börners *Physica, Oder Vernünfftige Abhandlung Natürlicher Wissenschaften, Worinnen nicht nur Sämmtliche Welt-Cörper nach mathematischen Gründen betrachtet, sondern auch andere zur Natur-Lehre gehörige Sachen untersucht, und die vorkommenden Phänomena hinlänglich erkläret werden* (Franckfurth etc., 1735)

- [p. 12] “Doct. Georg **Ventzky** til Prentzlau i hans tredie Fortsettelse af de saa kaldede vermischte Anmerkungen” = Georg Venzky, *Fortsetzung Vermischter Anmerkungen ...* [c. 1750, not seen]
- [p. 12] “Hr. **Eulers** Untersuchung des Nordlichts i den anden Deel af Histoire de l’Academie Royale” = Mr. [Leonhard] Euler, “Recherches Physiques sur la cause de la queüe des comètes, de la lumière boréale, et de la lumière zodiacale”, in: *Histoire de l’Académie Royale des Science et Belles Lettres de Berlin Année MDCCXLVI* (1748), pp. 117–140
- [p. 13] “**Biblioth. Britannique** Tome XXI. P. II. Pag. 336 hvor blant andre Piecer af de Engelske Philosophical Transactions recenseret” = *Bibliothèque britannique, ou Histoire des ouvrages des sçavans de la Grande-Bretagne* Tome vingt-unième, Seconde partie (1748)
- [p. 13] “Mons. **Desaguliers** Conjectures sur l’Electricité & sur l’elevation des vapeurs” = “Quelques Conjectures sur l’Electricité & sur l’Élévation des Vapeurs par Mr. Desaguliers”, in: *Bibliothèque britannique, ou Histoire des ouvrages des sçavans de la Grande-Bretagne* Tome vingt-unième, Seconde partie (1748), pp. 336–340 [English original: J. T. Desaguliers, “Some Conjectures concerning Electricity, and the Rise of Vapours”, in: *Philosophical Transactions of the Royal Society of London* Vol. XLII. For the Years 1742 and 1743, No. 462 (1744), pp. 140–143]
- [p. 11] “Petr. Van **Muschenbroeck** Elementa Physicæ §. 1116 p.m. 479” = *Elementa Physicæ conscripta in usus academicos* a Petro van Musschenbroeck. Editio altera (Lugduni Batavorum, 1741)
- [p. 19] “Jo. Henr. **Feustkingii** Gynæceo Hæret. Fanat. p. m. 658” = Io. Henr. Feustkingii, *Gynaecium haeretico-fanaticum, oder Historie und Beschreibung der falschen Prophetinnen, Quäckerinnen, Schwärmerinnen, und anderen sectirischen und begeisterten Weibes-Personen* (Franckfurt, 1704)

NATÜRLICHE HISTORIE VON NORWEGEN

Summary of Contents pertaining to the Aurora Borealis (first German edition) by Per Pippin Aspaas

The “Natural History of Norway” is a comprehensive description of the natural phenomena, wildlife and inhabitants of Norway. The early-modern term natural history included meteorology and geophysics, and even ethnography and folklore. It is in the very first chapter of the first volume, describing “the air [i.e. climate] of Norway”, that a detailed description of the aurora borealis is found. The same phenomenon is also highlighted in a Preface by the German translator as well in the Preface by Pontoppidan himself.

All parts of Pontoppidan’s *Natürliche Historie von Norwegen* that pertain to the aurora borealis are included in this volume. Reference to other contemporaneous editions – namely, the original Danish edition (hereafter referred to as DAN) and the anonymous English edition (ENG) – is found in [brackets]; the editions in question are also summarized separately below.

For this issue of *Aurorae Borealis Studia Classica*, only the first German edition, translated by Johann Adolph Scheibe and published in Copenhagen by Franz Christian Numme (in two volumes, 1753–54), has been investigated. There were, however, at least two further German editions during the eighteenth century: a seemingly unchanged reprint of the Numme edition published by Johann Christoph Korte (Flensburg & Leipzig, 1769) and an abridged version by August Mylius (in *Sammlung der besten und neuesten Reisebeschreibungen in einem ausführlichen Auszuge ... Zweyter Band*, pp. 115–239. Berlin, 1764).²

² These versions are available online, see the permanent links: <http://mdz-nbn-resolving.de/urn:nbn:de:bvb:12-bsb11095463-0>; <http://data.onb.ac.at/rep/10365F16>.

All quotations have been translated from the German by the author of this summary, even in cases where Scheibe's 1753 translation is considered to be an inaccurate rendering of the Danish original.

[Title page], Vorrede des Uebersetzers (pp. 9–25; missing in DAN & ENG), Vorrede des Verfassers (26–53 = DAN, no pages; ENG, iii–xx) & Inhalt ([1]–[9] = DAN, no pages; ENG, ([xxiv])

Full title: *Versuch einer natürlichen Historie von Norwegen, worinnen die Luft, Grund und Boden, Gewässer, Gewächse, Metalle, Mineralien, Steinarten, Thiere, Vögel, Fische und endlich das Naturel, wie auch die Gewohnheiten und Lebensarten der Einwohner dieses Königreichs beschrieben werden* (“Attempt at a natural history of Norway, presenting the air, earth and soil, waters, plants, metals, minerals, stones, animals, birds, and fish of the Kingdom as well as the character and way of life of the inhabitants.”). The translator's Preface (“Vorrede des Uebersetzers”), the author's own Preface (“Vorrede des Verfassers”), and Table of Contents (“Inhalt”) provide details about the aims and scope of the work and its overall structure.

In the “Vorrede des Uebersetzers”, the translator Johann Adolph Scheibe [or Scheiben, 1708–1776] praises Pontoppidan as a skilful compiler, able to extract useful information from a variety of sources. “His interspersed assessments and remarks are likewise worthy of their noble author, and are evidence of his praiseworthy insight in the natural sciences” (p. 17). Scheibe here highlights Pontoppidan's theory of the aurora as particularly noteworthy and likely to be true, essentially for two reasons. He has observed the aurora himself from Copenhagen and found it to resemble electrical phenomena; and he has read in Barhow's book on the Northern Lights [i.e. Laurids Barhow, *Richtig angestellte und aufrichtig mitgetheilte Observationes von dem seit eines halben Seculi in den meisten europäischen Ländern sehr merklich zeigenden und bekannt gewordenen Phaenomeno, unter dem Namen von Nord-Licht*, 1751] about eyewitness accounts from far northern Norway that lend further weight to the theory (p. 18).

In the “Vorrede des Verfassers” (author's Preface), a lengthy quotation from Pontoppidan's colleague, Jens Chr. Spidberg in Christiansand (Kristiansand) is of particular interest regarding the aurora (pp. 45–48 = DAN, no pages; ENG, xiv–xvii). Spidberg – whose writings on the aurora are included in [Vol. V](#) of *Aurorae Borealis Studia Classica* – argues in a letter to the author that European science would have benefited from empirical data from the farthest north. Pierre Louis Moreau de Maupertuis, who found evidence for the shape of the Earth by measuring a degree of meridian in the Tornedal Valley (northernmost Sweden) in 1736–37, would according to Spidberg have found more accurate evidence by travelling

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Von der Luft und von dem, was sich darinnen äussert (pp. [3]–64) [=DAN, [1]–56; ENG, (1)–34]

“The first chapter. On the air, and that which expresses itself therein”.

In §§. 1–2 of the chapter, Pontoppidan confesses that he has little personal experience with regions inside the Polar Circle [p. 4 = DAN, 3; ENG, 2]. Nevertheless, he does describe the polar winters of the far north, during which time “a moderate dusk, lasting for about one and a half hours” constitutes the only ‘daylight’ [p. 9 = DAN, 6; ENG, 4]. It is in this context that he introduces the Aurora Borealis, which often glows so bright as to facilitate outdoor activity [p. 9 = DAN, 6–7; ENG, 4].

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Pontoppidan further mentions theories of the aurora as related to lightning, a phenomenon which allegedly also has to do with sulphurous matter in the air, except that in the case of an aurora no thunder accompanies it. As an example of this school of thought, Pontoppidan quotes Nicolaus Börner (*Physica, oder Vernünftige Abhandlung natürlicher Wissenschaften*, 1742), who in turn cites [Christian] Wolff [p. 14 = DAN, 11; ENG, 7]. In support of this ‘lightning-without-thunder’ theory are reports that Pontoppidan have heard from “certain good friends in this country”, who “have assured me that these *Fulgura spuria* [‘false

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According to a theory that Pontoppidan finds more plausible, the aurora takes place when clouds high in the atmosphere of the polar regions are lit up by the rays of the sun from below the horizon. Pontoppidan here quotes [Georg] Ventzky (or Venzki, *Vermischte Anmerckungen*, 1747–) and [Leonhard] Euler ("Recherches Physiques sur la cause de la queüe des comètes, de la lumière boréale, et de la lumière zodiacale", 1746/48) [pp. 15–16 = DAN, 12; ENG, 7–8].

Finally, on pp. 16–22 Pontoppidan introduces the theory to which he himself, albeit with considerable caution, adheres. "If anybody expect me to present my own opinion about this still problematic phenomenon [...], it would not be too far removed from the idea [...] that the aurora should have its origin in the electricity of the atmosphere, and that it accordingly should be present everywhere and at all times, but only visible to our eyes under certain circumstances" [p. 16 = DAN, 13; ENG, 8]. As foundation for his theory, Pontoppidan refers to a French collection, *Bibliothèque Britannique* (Tome 21, Part 2, 1743), detailing British laboratory experiments on electricity. Among the works rehearsed in that volume is the article "Some Conjectures concerning Electricity, and the Rise of Vapours" by [John Theophilus] Desaguliers. Pontoppidan quotes Desaguliers' work in French translation on pp. 17 – 19 [= DAN, 14–16; ENG, 8–10]. The article by Desaguliers explains how evacuated glass tubes can emit light when rubbed by a hand (i.e., static electricity). Vapours in the air, Desaguliers argues, can be electrical as well, at least under certain atmospheric conditions. Along this line of reasoning Pontoppidan argues that the air itself is comparable to a glass tube, with electric light (i.e., Aurora Borealis) occurring under favourable conditions. Various properties of the phenomenon are easy to reconcile with this theory, Pontoppidan argues [pp. 19–22 = DAN, 16–19; ENG, 10–11].

As a sequel to the discussion of the state-of-the-art in contemporaneous auroral research, Pontoppidan touches upon the folklore of former times. In the previous century, the aurora appears to have been observed more rarely, a circumstance that contributed to the spread of superstitious beliefs, he conjectures [pp. 22–23, with footnote on continued on p. 24 = DAN, 19, including footnote continued on p. 20; ENG, 12].

The rest of the chapter deals with the winter climate and its influence on society (§. 4–8), followed by similar descriptions of the summer climate (§. 9–11), precipitation (§. 12–15), and winds (§. 16).

References to literature on the Aurora Borealis in the first German edition

- [translator's Preface, p. 18] “Herr Pastor **Barhow** in seinem Tractat vom Nordlichte” = Laurids Barhow, *Richtig angestellte und aufrichtig mitgetheilte Observationes von dem seit eines halben Seculi in den meisten europäischen Ländern sehr merklich zeigenden und bekannt gewordenen Phaenomeno, unter dem Namen von Nord-Licht : worinn dessen Historie, seine Bewegungen, Vorstellungsarten, Zeiten, Orten und Hindernisse seiner Erscheinung als auch, was aus der gleichen Wahrnehmungen sicher kann geschlossen werden, nebst einer beygefügtten Hypothesi, dessen Ursprung und Ursache; zum Vergnügen aller Liebhaber der Naturwissenschaft, insonderheit aber zum Dienst der Physicorum, denen es an zulänglichen und in den nordlichsten Ländern genommenen Observationes bishero gemangelt hat, um den wahren Grund desselben ausfündig zu Machen* (Frankfurt & Leipzig, 1751)
- [Spidberg's letter in Pontoppidan's Preface, p. 46] “der Herr **Mairan** ... *Traité Physique de l'Aurore Boreale*” = Jean-Jacques Dortous de Mairan, *Traité Physique et Historique de l'Aurore Boréale* (Paris, 1733)
- [Spidberg's letter in Pontoppidan's Preface, p. 48] “von dem Nordlicht” = Jens Christian **Spidbergs** *Historische Demonstration und Anmerckung über die Eigenschafften und Ursachen des so genandten Nord-Lichts* (Halle, 1724) [see *Aurorae Borealis Studia Classica*, [vol. V](#)]
- [p. 10] “der Herr Justizrath J. F. **Ramus** ... in den Actis Societatis Hafniensis Tom. I. No. IX. T. 3. No. VI.” = Joachim Frederik Ramus, “Historisk og physisk Beskrivelse over Nordlysets forunderlige Skikkelse, Natur og Oprindelse”, in: *Skrifter, som udi det Kiøbenhavnske Selskab af Lærdoms og Videnskabers Elskere ere fremlagte og oplæste*, vol. I (1743), pp. 317–396 & vol. III (1747), pp. 147–212 [Latin edition: Joachimi Friderici Rami “Historico-Physica enarratio de stupendis Luminis Borealis phoenomenis, natura et origine”. In: *Scriptorum a Societate Hafniensi bonis artibus promovendis dedita Danice editorum, nunc autem in Latinum sermonem conversorum* Pars Prima (1745), pp. 317–394 & Pars Tertia (1747), pp. 209–272]
- [p. 10] “Seekapitän Joh. **Heitmann** ... Schrift ... von der Wärme der Sonne u.s.w.” = Johan Heitmans *Physiske Betænkninger over Solens Varmer, Luftens skarpe Kuld og Nord-Lyset* (Kjøbenhavn, 1741)
- [p. 14] “D. Nicolai **Börners** Physica §. 247 = D. Nicolai Börners *Physica, Oder Vernünfftige Abhandlung Natürlicher Wissenschaften, Worinnen nicht nur Sämmtliche Welt-Cörper nach mathematischen Gründen betrachtet, sondern auch andere zur Natur-Lehre*

gehörige Sachen untersucht, und die vorkommenden Phänomene hinlänglich erkläret werden (Franckfurth etc., 1735)

- [p. 15] “Herr Doktor **Ventzky** in Prenzlau in seiner dritten Fortsetzung der so genannten vermischten Anmerkungen” = Georg Venzky, *Fortsetzung Vermischter Anmerkungen ...* [c. 1750, not seen]
- [p. 15] “dess grossen **Eulers** Untersuchung des Nordlichts, die sich im zweyten Theile der Histoire de l’Academie Royale befindet” = [Leonhard] Euler, “Recherches Physiques sur la cause de la queue des comètes, de la lumière boréale, et de la lumière zodiacale”, in: *Histoire de l’Académie Royale des Science et Belles Lettres de Berlin Année MDCCXLVI* (1748), pp. 117–140
- [p. 17] “Biblioth. Britannique Tome XXI. P. II. p. 336” = *Bibliothèque britannique, ou Histoire des ouvrages des sçavans de la Grande-Bretagne* Tome vingt-unième, Seconde partie (1748)
- [p. 17] “eine Abhandlung des Herrn **Desaguliers** names: Conjectures sur l’Electricité & sur l’elevation des vapeurs” = “Quelques Conjectures sur l’Electricité & sur l’Élévation des Vapeurs par Mr. Desaguliers”, in: *Bibliothèque britannique, ou Histoire des ouvrages des sçavans de la Grande-Bretagne* Tome vingt-unième, Seconde partie (1748), pp. 336–340 [English original: J. T. Desaguliers, “Some Conjectures concerning Electricity, and the Rise of Vapours”, in: *Philosophical Transactions of the Royal Society of London* Vol. XLII. For the Years 1742 and 1743, No. 462 (1744), pp. 140–143]
- [p. 21] “Petr. Van **Muschenbroeck** Elementa Physicæ §. 1116” = *Elementa Physicæ conscripta in usus academicos* a Petro van Musschenbroek. Editio altera (Lugduni Batavorum, 1741)
- [p. 23] “J. H. **Feustkings** Gynæceo Hæret. Fanat. p. m. 658” = Io. Henr. Feustkingii, *Gynaeceum haeretico-fanaticum, oder Historie und Beschreibung der falschen Prophetinnen, Quäckerinnen, Schwärmerinnen, und anderen sectirischen und begeisterten Weibes-Personen* (Franckfurt, 1704)

NATURAL HISTORY OF NORWAY

Summary of Contents pertaining to the Aurora Borealis (first English edition) by Per Pippin Aspaas

The “Natural History of Norway” is a comprehensive description of the natural phenomena, wildlife and inhabitants of Norway. The early-modern term natural history included meteorology and geophysics, and even ethnography and folklore. It is in the very first chapter of the first volume, describing “the air and its phenomena”, that a detailed description of the aurora borealis is found. The same phenomenon is also highlighted in the Preface.

All parts of Pontoppidan’s *Natürliche Historie von Norwegen* that pertain to the aurora borealis are included in this volume. Reference to other contemporaneous editions – namely, the original Danish edition (hereafter referred to as DAN) and the first German edition by Johann Adolph Scheibe (GER) – is found in [brackets].

All quotations have been taken directly from the English 1755 edition, even in cases where the translation is considered to be an inaccurate rendering of the Danish original. Even though the translation is anonymous, it is commonly ascribed to Andreas Berthelson, a Norwegian-born priest at the Danish Lutheran Church in London.⁴

[Title page], The Author’s Preface, & The Contents (i–xxi) [=DAN, *no pages*; GER, (1), 26–53, (54)–(62)]

Full title: “The Natural History of Norway, containing, A particular and accurate Account of the Temperature of the Air, the different Solis, Waters, Vegetables, Metals, Minerals, Stones, Beasts, Birds, and Fishes; together with the Dispositions, Customs, and Manner of Living of the Inhabitants: Interspersed with Physiological Notes from eminent Writers, and

⁴ Ehrencron-Müller, *Forfatterlexikon omfattende Danmark, Norge og Island indtil 1814*, vol. I (1924), p. 375.

Transactions of Academies”. The Author’s Preface (pp. iii–xx) and table of Contents (xxi) provide details about the aims and scope of the work and its overall structure.

Of particular interest regarding the aurora is a lengthy quotation from Pontoppidan’s colleague, Jens Chr. Spidberg in Christiansand (Kristiansand) [pp. xiv–xvii = DAN, *no pages*; GER, 45–48]. Spidberg – whose writings on the aurora are included in [Vol. V](#) of *Aurorae Borealis Studia Classica* – argues in a letter to the author that European science would have benefited from empirical data from the farthest north. Pierre Louis Moreau de Maupertuis, who found evidence for the shape of the Earth by measuring a degree of meridian in the Tornedal Valley (northernmost Sweden) in 1736–37, would according to Spidberg have found more accurate evidence by travelling even farther north, to the Norwegian region of Finnmark. Similarly, the widely read *Traité Physique et Historique de l’Aurore Boréale* (1733) by the French natural philosopher Jean-Jacques Dortous de Mairan would have become a far more reliable book if only he had conducted his research in the Kingdom of Norway, “for the north light takes its rise from Norway, and particularly from the diocese of Drontheim” [p. xv = DAN, *no page*; GER, 46].⁵

Chapter I. Of the Air and its Phenomena (pp. [1]–34) [=DAN, (1)–56; GER; (3)–64]

In the first two sections, Pontoppidan confesses that he has little personal experience with regions inside the Polar Circle [p. 2 = DAN, 3; GER, 4]. Nevertheless, he does describe the polar winters of the far north, during which time “a faint glimmering of about an hour and a half’s continuance” constitutes the only ‘daylight’ [p. 4 = DAN, 6; GER, 9]. It is in this context that he introduces the Aurora Borealis, which often glows so bright as to facilitate “ordinary labors” [p. 4 = DAN, 6–7; GER, 9].

Sect. III. deals with the Aurora Borealis as well as the so-called *morild*, or luminescence of the sea at night.

According to a lengthy quotation from a work by Johan Heitman (*Physiske Betænkninger over Solens Varme, Luftens skarpe Kuld og Nord-Lyset*, 1741), the aurora originates from salty matter (“nitrous vapours”) evaporating from the sea during certain climatic conditions. Heitman places the aurora in the same category as *morild*, which only takes place when the sea is stirred at night and is never witnessed in sweet water [pp. 5–7 = DAN, 8–11; GER, 10–14].

⁵ Drontheim (or Nidaros, now Trondheim) was at that time the northernmost administrative part of Norway, reaching all the way up to the North Cape and the Russian border. By singling out two of the most influential exponents of French science for criticism, Spidberg stakes his claim that first-hand experience with natural phenomena trumps theoretical ingenuity. The quality of observations, in turn, hinges on the geographical area in which they are recorded.

Pontoppidan further mentions theories of the aurora as related to lightning, a phenomenon which allegedly also has to do with sulphurous matter in the air, except that in the case of an aurora no thunder accompanies it. As an example of this school of thought, Pontoppidan quotes Nicolaus Börner (*Physica, oder Vernünfftige Abhandlung natürlicher Wissenschaften*, 1742), who in turn cites [Christian] Wolff [p. 7 = DAN, 11; GER, 14]. In support of this ‘lightning-without-thunder’ theory are reports that Pontoppidan have heard from “some persons of credit”, who “have assured me, that these Fulgura spuria [‘false lightnings’], are not always without a crack or sound, for in a glaring north-light, and calm weather, a distinct sound has been heard, with an explosion in the air, like the sudden breaking of the ice” [p. 7 = DAN, 11; GER, 14–15].

Pontoppidan is less inclined to believe in theories of the aurora being caused by volcanos supposedly situated beyond Greenland [p. 7 = DAN, 11–12; GER, 15].

According to a theory that Pontoppidan finds more plausible, the aurora takes place when clouds high in the atmosphere of the polar regions are lit up by the rays of the sun from below the horizon; Pontoppidan here quotes Georg Ventsky (or Venzki, *Vermischte Anmerkungen*, 1747–) and [Leonhard] Euler (“Recherches Physiques sur la cause de la queue des comètes, de la lumière boréale, et de la lumière zodiacale”, 1746/48) [pp. 7–8 = DAN, 12; GER, 15–16].

Finally, on pp. 8–11 Pontoppidan introduces the theory to which he himself, albeit with considerable caution, adheres. “If I may be allowed, or expected, to add any opinion of my own on this problematic subject; it may perhaps be not more improbable than what hath been already alleged, if we admit, that the original cause of the north-light lies in the electricity of the ethereal air; and, consequently, that it has existed at all times, and in all places, tho’ not visible to us, without a concurrence of such concurrent circumstances and junctures, as I shall here exhibit” [p. 8 = DAN, 13; GER, 16]. As foundation for his theory, Pontoppidan refers to a French collection, *Bibliothèque Britannique* (Tome 21, Part 2, 1743), detailing British laboratory experiments on electricity. Among the works rehearsed in that volume is the article “Some Conjectures concerning Electricity, and the Rise of Vapours” by [John Theophilus] Desaguliers. Pontoppidan quotes Desaguliers’ work on pp. 8–10 [= DAN, 14–16; GER, 17–19]. The article by Desaguliers explains how evacuated glass tubes can emit light when rubbed by a hand (i.e., static electricity). Vapours in the air, Desaguliers argues, can be electrical as well, at least under certain atmospheric conditions. Along this line of reasoning Pontoppidan argues that the air itself is comparable to a glass tube, with electric light (i.e., Aurora Borealis) occurring under favourable conditions. Various properties of the

phenomenon are easy to reconcile with this theory, Pontoppidan argues [pp. 10–11 = DAN, 16–19; GER, 19–22].

As a sequel to the discussion of the state-of-the-art in contemporaneous auroral research, Pontoppidan touches upon the folklore of former times. In the previous century, the aurora appears to have been observed more rarely, giving rise to some superstition, he conjectures [p. 12; DAN, 19–20; GER, 23–24].

The rest of the chapter deals with the winter climate and its influence on society (§. 4–8), followed by similar descriptions of the summer climate (§. 9–11), precipitation (§. 12–15), and winds (§. 16).

References to literature on the Aurora Borealis in the first English edition

- [p. xv, Spidberg's letter in the Preface] "M. de **Mairan** ... *Traité Physique de l'Aurore Boreale*" = Jean-Jacques Dortous de Mairan, *Traité Physique et Historique de l'Aurore Boréale* (Paris, 1733)
- [p. xv, Spidberg's letter in the Preface] "of the North-light" = Jens Christian **Spidbergs** *Historische Demonstration und Anmerckung über die Eigenschafften und Ursachen des so genandten Nord-Lichts* (Halle, 1724) [see *Aurorae Borealis Studia Classica*, [vol. V](#)]
- [p. 5] "counsellor **Ramus** ... in the Acta Societatis Hafniensis, T. I. No. IX. and T. III. No. VI." = Joachim Frederik Ramus, "Historisk og physisk Beskrivelse over Nordlysets forunderlige Skikkelse, Natur og Oprindelse", in: *Skrifter, som udi det Kiøbenhavnske Selskab af Lærdoms og Videnskabers Elskere ere fremlagte og oplæste*, vol. I (1743), pp. 317–396 & vol. III (1747), pp. 147–212 [Latin edition: Joachimi Friderici Rami "Historico-Physica enarratio de stupendis Luminis Borealis phoenomenis, natura et origine". In: *Scriptorum a Societate Hafniensi bonis artibus promovendis dedita Danice editorum, nunc autem in Latinum sermonem conversorum* Pars Prima (1745), pp. 317–394 & Pars Tertia (1747), pp. 209–272]
- [p. 5] "Capt. **Heitman** ... on the heat of the sun, &c. and likewise on the north-light" = Johan Heitmans *Physiske Betænkninger over Solens Varme, Luftens skarpe Kuld og Nord-Lyset* (Kjøbenhavn, 1741)
- [p. 7] "Dr. Nicholas **Boerner**, in his Physics, chap. xi. p. 284" = D. Nicolai Börners *Physica, Oder Vernünfftige Abhandlung Natürlicher Wissenschaften, Worinnen nicht nur Sämmtliche Welt-Cörper nach mathematischen Gründen betrachtet, sondern auch andere zur Natur-Lehre gehörige Sachen untersucht, und die vorkommenden Phänomena hinlänglich erkläret werden* (Franckfurth etc., 1735)
- [p. 7] "Dr. **Ventsky** of Prentslau in his third publication of Miscellaneous Observations" = Georg Venzky, *Fortsetzung Vermischter Anmerkungen* ... III [c. 1750, not seen]

- [p. 7–8] “Mr. **Eulers** enquiry into the north-light ... in the second part of the *Histoire de l’Academie*” = Mr. [Leonhard] Euler, “Recherches Physiques sur la cause de la queue des comètes, de la lumière boréale, et de la lumière zodiacale”, in: *Histoire de l’Académie Royale des Science et Belles Lettres de Berlin Année MDCCXLVI* (1748), pp. 117–140
- [p. 8] “**Bibliothèque Britannique**, Tom. XXI. P. II. pag. 336. where ... extracts from the *Philosophical Transactions* ...” = *Bibliothèque britannique, ou Histoire des ouvrages des sçavans de la Grande-Bretagne* Tome vingt-unième, Seconde partie (1748)
- [pp. 8–9] “a piece of M. **Desaguliers**, ... A Dissertation concerning electricity” = “Quelques Conjectures sur l’Electricité & sur l’Élévation des Vapeurs par Mr. Desaguliers”, in: *Bibliothèque britannique, ou Histoire des ouvrages des sçavans de la Grande-Bretagne* Tome vingt-unième, Seconde partie (1748), pp. 336–340 [English original: J. T. Desaguliers, “Some Conjectures concerning Electricity, and the Rise of Vapours”, in: *Philosophical Transactions of the Royal Society of London* Vol. XLII. For the Years 1742 and 1743, No. 462 (1744), pp. 140–143]
- [p. 11] “Petr. Van **Muschenbroek**, *Elementa Physicæ*, Sect. 1116” = *Elementa Physicæ conscripta in usus academicos* a Petro van Musschenbroek. Editio altera (Lugduni Batavorum, 1741)
- [p. 12] “J. H. **Feustking**’s *Gynæceo Hæret. Fanat.* p. m. 658” = Io. Henr. Feustkingii, *Gynaeceum haeretico-fanaticum, oder Historie und Beschreibung der falschen Prophetinnen, Quäckerinnen, Schwärmerinnen, und anderen sectirischen und begeisterten Weibes-Personen* (Franckfurt, 1704)