The Academy in society

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The Academy under absolutism

The early days

From the very beginning, when four men met in a private residence, the Academy was intended to play an active role in Dano-Norwegian society. One of its four founders, Johan Ludvig Holstein, held a high position in the central administration and in learned circles, among other roles as patron of the university. He had the ear of King Christian VI, whom he kept closely informed about the plans and discussions which resulted in the Academy's founding.

King Christian VI was deeply involved in Pietism, which emphasized the value of an active life of piety rooted in a deep personal Christian faith. Pietists understood enlightenment and education as the preconditions for true faith, and the King worked to raise the educational level of the population of Denmark-Norway, from primary school to the university. He valued science and scholarship, and he understood as well that research requires investment: throughout his reign, he supported a series of more or less scientific and scholarly endeavors which could benefit the kingdom and enhance the reputation of its regent.

The Academy evolved out of a royal commission which had been established to catalogue the King's collection of coins and medals (read more on p. 17). In addition to Holstein, the commission's members included the historian Hans Gram, the pietistic theologian Erik Pontoppidan, who was interested in history, and Henrik Henriksen, later ennobled as Hielmstierne, who served as secretary. While the task of organizing the collection was soon completed, the preparation of the catalogue required a comprehensive effort, and the commission's members determined that scientific and scholarly collaboration on a larger scale was needed.

To begin with, Gram composed a proposal to establish a "Collegium Antiquitatum" to study the nation's past (see p. 19). Gram was deeply inspired by the various academies which had been established throughout Europe in the spirit of the Enlightenment to explore the world for the benefit of mankind and society. His proposal was submitted to the King, who approved the establishment of "a learned academy of this kind". On November 13th 1742, the four members of the commission met to discuss the proposal in detail. They expanded the topics to be covered by the new academy - and thereby the scientific and scholarly specializations of its potential members - to include "all sciences and types of scholarship" in principle. They reaffirmed the principle set out in the original proposal that the academy's activities should be organized so as "to benefit His Royal Highness and to the honor of the nation", in other words, to meet the requirements of the state and serve society. At their meetings, the members of the academy were to define topics and problems which were worthy of study, and to select the results which were worthy of publication after they had been presented and discussed.

The closest approximation to an official charter that the Academy possesses is the royal rescript of January 11th 1743 (see p. 208.). The letter is addressed to Holstein and through him, to the other three founders. They are urged to occupy themselves with "learned and useful activities that you believe would be pleasurable to us, contribute to the honor of the nation and the country, and instructive and beneficial to the sci-

FIGURE 1. The Academy's oldest minute book. The first minutes are from the founding meeting of November 13th 1742, and the minute book ends with 1770. The Academy's archive.

ences". In other words, the advancement of science and scholarship is to be a goal in itself, in addition to benefitting Dano-Norwegian society. These goals were to be reached, as described in Gram's plan, through meetings which included discussions and subsequent publication of "what might be useful as well as appropriate" (ibid.). With regard to the membership of the coming academy, the rescript states:

> In addition, you must consider inviting to this academy those who in natural history, as well as those in the medical, mathematical and mechanical sciences who are able to present remarkable inventions which could be considered worthy of revelation to Publico, and contribute both to the increase of the aforementioned sciences as to the praise and fame of their authors; such papers will be published in printed form in certain collections, after the manner of other societies, together with other papers which might be written about the history and antiquities of the nation and all other sciences.

It is remarkable that no reference is made here to censorship of the Academy's publications; according to the law, all manuscripts had to be approved by the University of Copenhagen before publication. Approval was granted with the formulation "imprimatur" [may be printed], which is found nowhere in the *Writings* of the Academy. The King could permit uncensored publication because all communications were first presented orally at the Academy's meetings, where they were discussed by the members, who criticized and proposed improvements to the work – in other words, in reality a form of internal censorship.

Even before the royal rescript, the Academy had been holding quite regular weekly meetings. At these meetings, the members presented the results of their research and their ideas for possible future tasks and projects to be undertaken by the Academy. The project of cataloguing the royal coin and medal collection was self-evident. There were also a couple of major works of national importance which only existed in manuscript form, and the members of the newly established academy assumed responsibility for their publication. The progress of this work and the problems encountered along the way were presented at the meetings, just like the scientific and scholarly communications which were to be published in the coming "Collections". It was decided early on that all contributions were to be presented "helter-skelter among each other"– in other words, in no particular order.

However, it does not appear that the issue of the language to be used by the Academy in its writings was discussed at the first meetings. Nonetheless, this was a burning question: if the Academy was to have an international impact, its publications absolutely had to be in Latin, the international language of the time. On the other hand, publication in Latin would exclude the vast majority of the King's subjects, who were not academics, and this would critically limit the social utility of the Academy's research. This was a serious dilemma, and its solution would be momentous.

We must look outside the Academy's archives for the earliest evidence of the language conflict. An undated anonymous plan for the organization of the academy, which must be from Gram's hand, and a copy of which is preserved at the Royal Library in Copenhagen, states that:

> The communications of the Academy must be printed in Latin, notwithstanding that the drafts are read aloud in Danish, because it cannot be assumed that it will be possible to find readers for them in the Danish language; however, a test might be made by publishing one volume in Danish as well, in order to determine whether it would be well-received by the nation.

Next to this paragraph, Holstein has inserted a marginal note: "delib", in other words 'to be deliberated' or considered. This deliberation took place at a meeting of the Academy on June 3rd 1744, at which it

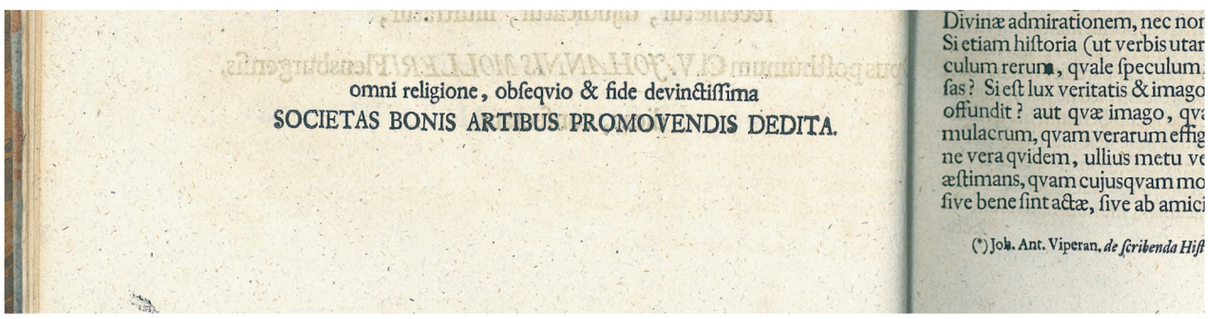
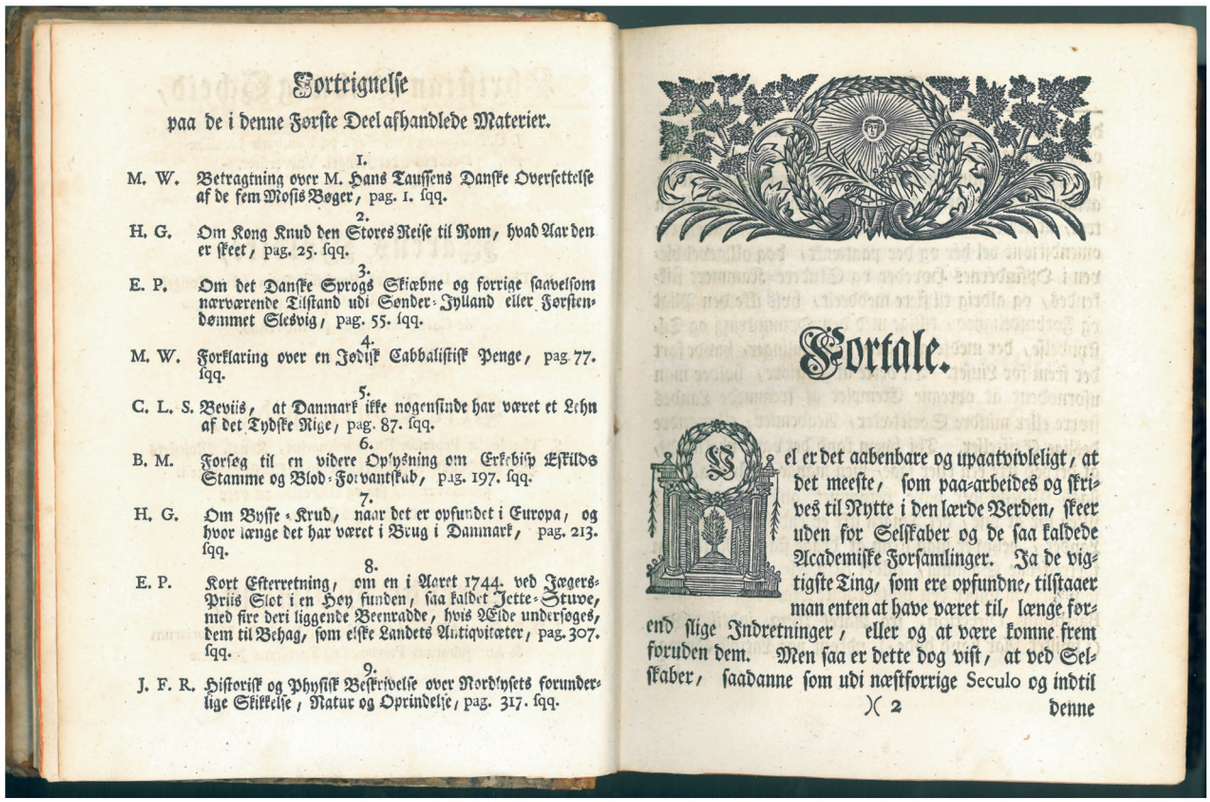

omni religione, obſeqvio & fide devinctiſſima
SOCIETAS BONIS ARTIBUS PROMOVENDIS DEDITA.
Divinæ admirationem, nec nor
Si etiam hiſtoria (ut verbis utar
culum rerum, qvale ſpeculum
ſas? Si eſt lux veritatis & imago
offundit? aut qvæ imago, qv
mulacrum, qvam verarum effig
ne vera qvidem, ullius metu ve
æſtimans, qvam cujusqvam mo
ſive bene ſint actæ, ſive ab amici
(*) Joh. Ant. Viperan. *de ſcribenda Hiſt*

FIGURE 2. Signature under the dedication to the King in Moller's *Cimbria Literata* (Moller 1744). This was the first time the Academy appeared in print.

FIGURE 3. The beginning of Hans Gram's preface to the first volume of the Academy's *Writings* from 1745 (Gram 1745). The preface is the Academy's first public manifesto.



Fortegnelse

paa de i denne Første Deel afhandlede Materier.

1.
M. W. Betragtning over M. Hans Taussens Danske Oversettelse af de fem Mosis Bøger, pag. 1. sqq.
2.
H. G. Om Kong Knud den Stores Reise til Rom, hvad Aar den er skeet, pag. 25. sqq.
3.
E. P. Om det Danske Sprogs Skiæbne og forrige saavelsom nærværende Tilstand udi Sønder-Jylland eller Forstendømmet Slesvig, pag. 55. sqq.
4.
M. W. Forklaring over en Jødisk Cabbalistisk Penge, pag. 77. sqq.
5.
C. L. S. Bevis, at Dannmark ikke nogensinde har været et Lehn af det Tydske Rige, pag. 87. sqq.
6.
B. M. Forseg til en videre Oplysning om Erkebisp Eskilds Stamme og Blod-Forvantskab, pag. 197. sqq.
7.
H. G. Om Bysse-Krud, naar det er opfundet i Europa, og hvor længe det har været i Brug i Dannmark, pag. 213. sqq.
8.
E. P. Kort Efterretning, om en i Aaret 1744. ved Jægerspriis Slot i en Høy funden, saa kaldet Jette-Stuve, med sire deri liggende Beenradde, hvis Alde undersøges, dem til Behag, som elske Landets Antiquitæter, pag. 307. sqq.
9.
J. F. R. Historisk og Physisk Beskrivelse over Nordsysels forunderlige Skikkelse, Natur og Oprindelse, pag. 317. sqq.

Fortale.

Vel er det aabenbare og upaatvivleligt, at det meeste, som paa-arbeides og skrives til Nytte i den lærde Verden, skeer uden for Selskaber og de saa kaldede Academiske Forsamlinger. Ja de vigtigste Ting, som ere opfundne, tilstaaer man enten at have været til, længe forend slige Indretninger, eller og at være komne frem foruden dem. Men saa er dette dog vist, at ved Selskaber, saadanne som udi næstforrige Seculo og indtil

)(2 denne

was decided that the Academy would publish exclusively in Danish – and while the minutes of the deliberation do not record a reason for this decision, it is entirely in line with Christian VI's efforts to raise the educational level of the population.

The first public initiatives

Ironically enough, the very first publication to bear the Academy's name was in Latin, the *Cimbria Literata*, a comprehensive lexicon of authors from Schleswig-Holstein and neighboring regions by Johannes Moller. After Moller's death in 1725, the manuscript gathered dust for some time, until Holstein got the Academy involved in its publication at a meeting of January 8th 1743, its second one. The work was published in three stately volumes (Moller 1744) with a substantial preface on historical method by Gram. The work is dedicated to the king of "SOCIETAS BONIS ARTIBUS PROMOVENDIS DEDITA" ('The society which is dedicated to the advancement of good sciences'). This is the first time the Academy appears in print – and with a name very far from those by which the Academy has referred to itself since.

The next year, the first volume of the Academy's collections was published under the title *Skrifter, som udi det Kiøbenhavnske Selskab af Lærdoms og Videnskabers Elskere ere fremlagte og oplæste i Aarene 1743 og 1744* (Writings which have been presented and read aloud in the Academy of the Lovers of Learning and Knowledge in Copenhagen in the years 1743 and 1744). Gram is the author of the preface (Gram 1745), which is a central manifesto as well as the first presentation of the Academy to the Academy's Dano-Norwegian audience.

The preface begins with a general assertion of the importance of academies of sciences and letters to the publication of new discoveries and inventions; many things are naturally brought forth without their involvement,

> But nonetheless it is true that many perfectly useful things, well-suited to the enlightenment of reason and the sciences, as well as pleasant and interesting, have been brought to light by the academies which have been established in different countries in the last century and down to our time. It can be believed with certainty that no small part of what is now known would have remained stuck in the heads and study chambers of its discoverers and never been communicated to others, unless the duty and obligation, as well as encouragement and prompting, which accompany learned associations, had brought it into the light.

Referring to the newly established academy in particular, Gram expresses a hope that this

> Academy of some few lovers of learning will be able to gain a favorable reputation, not alone among its equals and all students, but also among both the most elevated and the more humble inhabitants of the nation alike: Now it has undertaken to print part of what has been presented and read aloud in the past two years at its meetings (in between certain other undertakings graciously recommended by Your Royal Highness).

The main subject of the first volume is "the history of our nation, along with other small curiosities", but it was hoped that more important things could be published, preferably by "learned physicians and experts on nature, as well as mathematicians" in the coming volumes,

> In addition to which we will invite not only the aforementioned kinds of learned men, but all others as well who possess exceptional abilities in worthy arts and sciences, regardless of what kind of sciences they be (theology alone excepted, unless it be philological and interpretive of passages in the Holy Scriptures, or Church history) ... As long as something unusual, something useful, or at the very least something remarkable is contained therein, for the enlightenment and instruction of the living and for posterity.

This is an extremely open invitation which extends far beyond the circle of the Academy's very few members. The exclusion of theologians who study dogmatics is probably an expression of the Enlightenment's scepticism about questions of dogma, in addition to having a practical aspect: the exclusion enabled the Academy to avoid endless, heated theological discussions which could be dangerous into the bargain, because they overstepped the limits for what the State church could tolerate.

The choice of Danish is justified by a compromise between national and international considerations:

> And since from the beginning, the intention has not been for this work to advance further than to the knowledge and enjoyment of our own countrymen, as it primarily ... concerns our domestic affairs; so neither have we found any reason to use any other tongue than our own; especially as there are so many foreign precedents to follow in taking this position.

FIGURE 4. The first seven volumes of the Academy's *Writings* in a binding from the 1700s. Today they are kept in the editor's office, along with the rest of the Academy's publications since 1745.

Despite the modesty of the preface, the volume itself is not modest: 396 handsomely printed pages on good paper. Eight of the nine treatises are historical and philological, while the subject of the ninth is the Northern Lights (see p. 202), a phenomenon which would be revisited many times in subsequent volumes.

Volume 2 was published soon after, in 1746, and three of the treatises included in it are devoted to a topic of intense contemporary interest which had been discussed at the Academy's meetings over the course of 1745: the raging cattle plague or rinderpest, which was a serious problem with heavy economic and social consequences for the population of the kingdom (see p. 100). The government intervened and involved the Academy in combating the disease by allowing it to co-finance a microscope, which was to be used in examining sick animals.

At the appropriate time the third volume of the *Writings* was published in 1747, with the same miscellaneous contents and in the same format as the two previous volumes. Shortly after their publication in Danish, all three volumes were published in Latin translation, in all probability on Gram's initiative but not by the Academy. Gram was preoccupied with the Academy's position in international scientific and scholarly circles, and the position he expressed in the preface of 1745 was that of the Academy rather than his own. The publication of Latin editions of the Academy's *Writings* ceased with his death in 1748.

Cataloguing the royal collection of coins and medals, the project which had originally provided the impetus for the Academy's founding, turned out to be a large and costly enterprise, especially on account of the many copperplate engravings which were to illustrate

the coins. Although the Academy invested considerable time and funds in the project, it ended up slipping out of the Academy's hands altogether.

The same unfortunate fate befell the description of Christian VI's travels in Norway in 1733 (see p. 26). The anonymous manuscript was accompanied by numerous water colors which were to be turned into copperplates. The King, for whom the publication of the work was a high priority, directed Holstein to supervise the work. He presented the project at one of the Academy's first meetings, at which it was decided that the Academy should take it over. The matter appeared on agenda at regular intervals over the next six years. But after the death of Christian VI in 1746, royal interest in the matter faded, and along with it financial support for the project. In 1748, the Academy was forced to abandon it. A facsimile edition of the original manuscript, which belongs to Her Majesty the Queen's Private Library, was published in 1992, unassisted by the Academy.

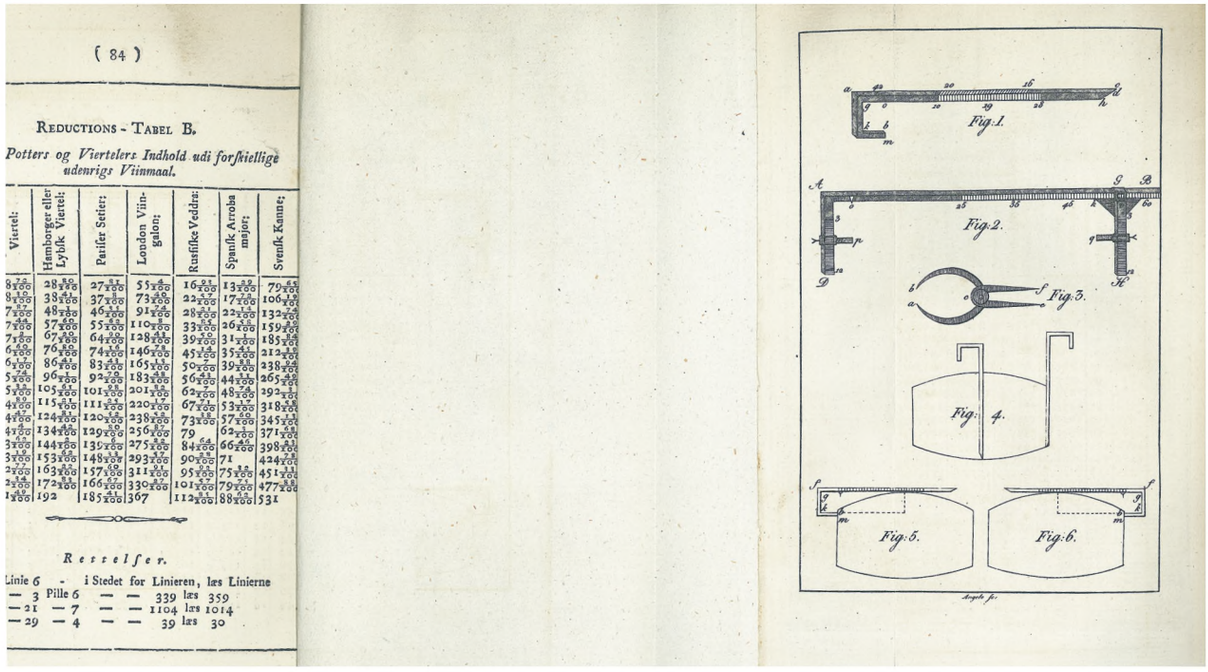
Daily life and the Academy's regular publications

The accession of King Frederik V to the throne in 1746 after the death of his father did not change the Academy's circumstances in any fundamental way, which applies to the entire absolutist period – with the exception of Struensee's short-lived regime 1770-1772, a rather chaotic parenthesis in the history of the Academy. This period aside, the high-ranking men who were elected president of the Academy guaranteed close contact to the Crown – at times so close that it can be difficult to determine whether an initiative was originally proposed by the King or 'planted' in His Majesty's mind by the Academy's president.

In principle, the Academy was a government body which participated in a wide variety of disparate projects and tasks at the behest of the government and the state administration. For example, astronomical, meteorological, and geomagnetic observations, testing sea clocks (clocks which were intended to work on sea voyages and under varying climatic conditions), measuring volume, which the customs authority found particularly relevant, and drilling artesian wells in order to gain access to better drinking water and learn about conditions underground.

Its meetings were the backbone of the Academy's inner life. The *Writings* also helped to keep the members together, for they also had an obligation – formally, and at least in some periods, in practice – to publish in the *Writings* at least once.

One of the main purposes of the *Writings* was to put research to use to the benefit of society, and many of its articles were intended for a popular audience. Nonetheless, the books did not sell well. For this reason, the Academy decided to strengthen its popular research communication efforts by publishing almanacs, a familiar popular genre with roots in the past. In addition to the calendar itself, the Academy's almanacs contain a miscellaneous assortment of short articles in which its members communicated useful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REDUCTIONS - TABEL B.

Potters og Viertelers Indhold udi forskiellige udenrigs Viinmaal.

Viertel:	Hamborger eller Lybsk Viertel:	Parisser Seiter:	London Viingalon:	Russiske Veddre:	Spansk Arroba mejor:	Svensk Kanne:
8 1/100	28 61/100	27 3/100	55 1/100	16 61/100	13 3/100	79 61/100
8 1/100	38 61/100	37 3/100	73 1/100	22 7/100	17 7/100	106 14/100
7 1/100	48 80/100	46 3/100	91 1/100	28 1/100	22 1/100	132 68/100
7 1/100	57 80/100	55 3/100	110 1/100	33 1/100	26 1/100	159 68/100
7 1/100	67 80/100	64 3/100	128 1/100	39 1/100	31 1/100	185 68/100
6 1/100	76 80/100	74 3/100	146 1/100	45 1/100	35 1/100	212 68/100
6 1/100	86 80/100	83 3/100	165 1/100	50 1/100	39 1/100	238 68/100
5 1/100	96 1/100	92 3/100	183 1/100	56 1/100	44 1/100	265 68/100
5 1/100	105 61/100	101 3/100	201 1/100	62 1/100	48 1/100	292 1/100
4 1/100	115 61/100	111 3/100	220 1/100	67 1/100	53 1/100	318 1/100
4 1/100	124 61/100	120 3/100	238 1/100	73 1/100	57 1/100	345 1/100
4 1/100	134 61/100	129 3/100	256 1/100	79 1/100	62 1/100	371 1/100
3 1/100	144 61/100	131 3/100	275 1/100	84 1/100	66 1/100	398 1/100
3 1/100	153 61/100	148 3/100	293 1/100	90 1/100	71	424 1/100
2 1/100	163 61/100	157 3/100	311 1/100	95 1/100	75 1/100	451 1/100
2 1/100	172 61/100	166 3/100	330 1/100	101 1/100	79 1/100	477 1/100
1 1/100	192	185 3/100	367	112 1/100	88 1/100	531

Rettelser.

Linie 6 - i Stedet for Linieren, læs Linierne
— 3 Pille 6 — — 339 læs 359
— 21 — 7 — — 1104 læs 1014
— 29 — 4 — — 39 læs 30

Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

Fig. 6.

FIGURE 5. Søren Bruun's design for a so-called gauging rod, a slide rule for calculating the contents of casks and barrels. In 1791, the Danish customs department requested the Academy to set and hold a prize treatise competition on the simplest, most durable, and most precise gauging rod, which took place two years later. Chartered surveyor Søren Bruun received a prize for his submission in 1796.

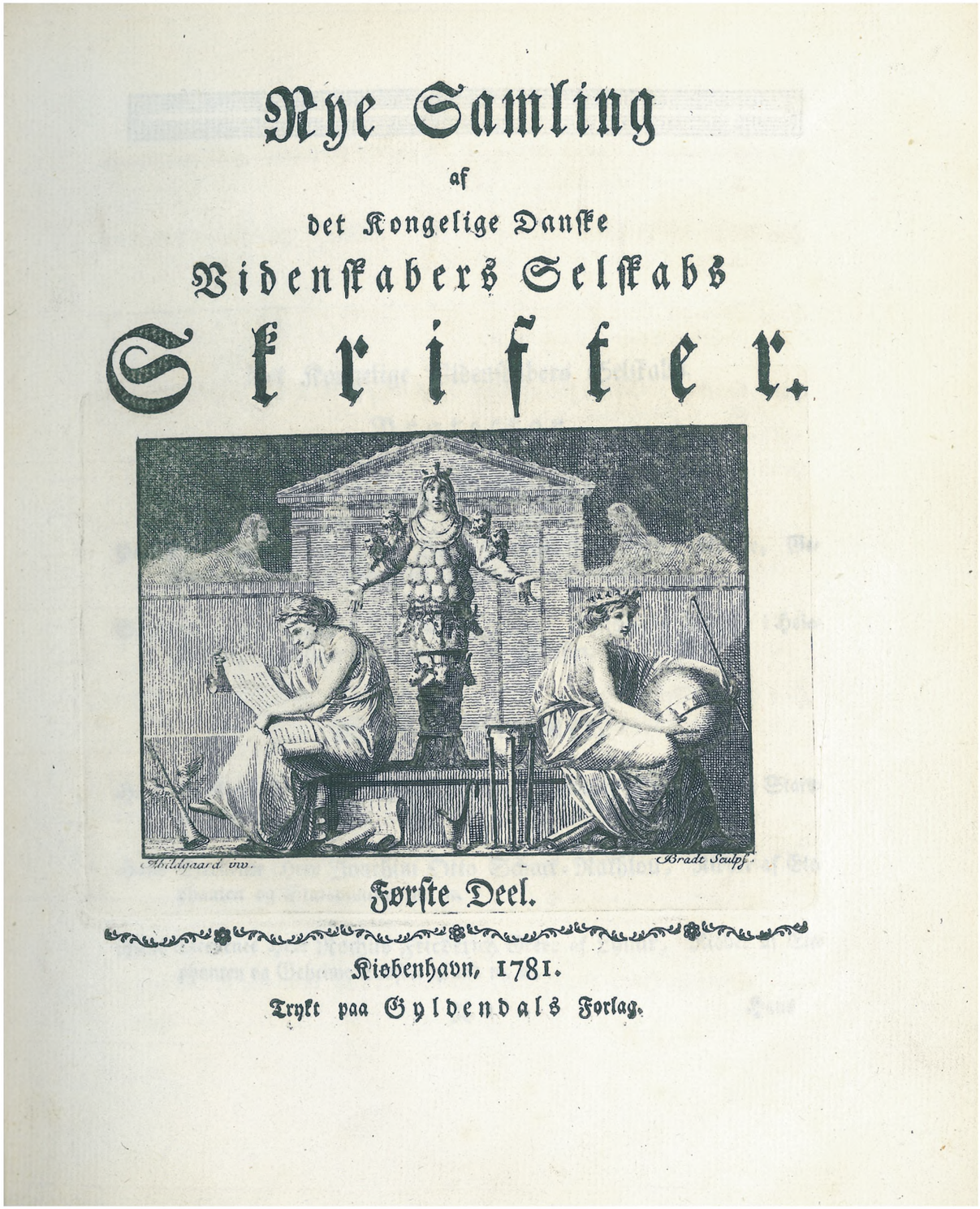


FIGURE 6. The title page of the *Writings* (1781), the first volume of a new series. The vignette was drawn by Nicolai Abildgaard and the copperplate was engraved by Frederik Ludvig Bradt. There is a statue of Artemis, Greek goddess of nature and fertility, in the middle of this complex image. Clio, the Muse of history, is seated in the foreground to the left, with the trumpet of fame and scrolls at her feet and on her lap. Urania, the Muse of astronomy, is seated to the right with the celestial sphere, on which the constellations are inscribed. The two Muses symbolize the Academy's two main branches of knowledge, the humanities and the natural sciences (Dal 1987, p. 8).

knowledge on various topics, for example astronomy, meteorology, topography and history. There was a heavy emphasis on history; "historical events" were included with each date. Each volume also contained a new map of a part of the King's vast realm; the collection of these rather small maps is the first Danish copperplate map of the entire kingdom of Denmark. *Dansk Historisk Almanak, Udgiven af Det Kongelige Videnskabernes Societet* (The Danish historical almanac, published by the Royal Danish Society of Sciences and Letters) was published between 1760 and 1782. The series was a success, and publication ceased primarily because the University of Copenhagen was granted the privilege of publishing almanacs.

In the long term, it proved impossible to continue publishing the *Writings* on an annual basis. In princi-

ple, they were still a mirror of the meetings, as they contained the scientific and scholarly lectures which had been presented orally, in addition to the introductory list of members. As time passed, it became difficult to gather sufficient material which the members considered worthy of publication, and publication became somewhat irregular; in the 1760s, five years passed between editions of the *Writings*, and seven years passed between volumes X and XI. After Volume XII, the Academy switched publishers, and primarily for this reason, a new series began in 1781 with a slightly altered title: *Nye Samling af det Kongelige Danske Videnskabers Selskabs Skrifter* (New collection of the writings of the Royal Danish Academy of Sciences and Letters). The name of the Academy essentially settled into its present form in this title.

The primary contents were still communications from the meetings, although this is no longer specified in the title. Gradually, the natural sciences articles came to dominate the publication, in parallel with the election of members from a wider range of disciplines. The *Writings* were still published in Danish, an absolute requirement which meant that contributions from foreign members had to be translated before publication.

In 1796, the Academy received new by-laws which revolutionized the *Writings:* Treatises by non-members would now be accepted "with pleasure", and contributing authors would receive the Academy's silver medal by way of gratuity. It soon became evident that this was a sensible arrangement. One of the most persistent and competent employees involved in the Academy's topographical survey of Denmark, Caspar Wessel, wrote the treatise *On the Analytical Representation of Direction: An Attempt Applied Chiefly to Solving Plane and Spherical Polygons* ("Om directionens analytiske Betegning, et Forsøg, anvendt fornemmelig til plane og sphæriske Polygoners Opløsning"), which had been read aloud by a member at a meeting on March 10th 1797 and was published in Volume V of the *Writings* in 1799. Although this treatise represented a radical breakthrough, it received no publicity, neither in Denmark nor abroad. To give Wessel the honor he deserved, the Academy published a centennial edition of the treatise in French, prefaced by a portrait of Wessel and an account of the significance of his work (Wessel 1897), which was followed one hundred years later by a bicentennial edition in English (Wessel 1997). A symposium on the topic was held the next year, and in addition to the symposium proceedings (2001), Jesper Lützen published a paper on Wessel the same year (Lützen 2001).

The beginning of a new century also saw the beginning of a new series of the *Writings*, which also changed their title once again, to *Det Kongelige Danske Videnskabers-Selskabs Skrivter* (The writings of the Royal Danish Academy of Sciences and Letters). But a more significant change was the switch to a new typeface: in 1799, the Academy decided to use Roman letters in all of its publications – an unusually forward-looking decision which has made life easier for subsequent generations, most recently in relation to the digitization of the Academy's publications. But at the time, the decision was controversial. It was customary to print Danish and German in black letter (or Gothic) type, while Roman type was reserved for Latin and Romance texts. The new editor of the *Writings*, Carl Christian Rafn, was responsible for this break with tradition; he was the friend of a printer who was carrying out a veritable crusade against black letter. The argument in favor of switching to Roman type was patently ridiculous: that it would make it easier for foreigners to read the Danish *Writings*. The literary scholar and philologist Christian Molbech, a prominent member of the Academy, characterized this innovation somewhat sourly but not unrealistically as

> an innovation which has contributed in no small degree to reducing even further the already limited audience the Academy's *Writings* have found in the 19th century, for the well-known reason that people here are most unwilling to read Danish books printed with Roman type.

The *Writings* changed in their contents as well as their typography, towards a greater emphasis on basic research. In Volume V of the *Writings* from 1810, obituaries of two members are included for the first time.

However, it was still difficult to gather sufficient material for the *Writings*. Around the turn of the century, there was an abundance of popular science periodicals, and many members published more frequently in these than in the *Writings*. The economic crisis during and after the Napoleonic Wars made it difficult to publish the *Writings* on a regular basis; the mixed character of the publication and the protracted publication procedure tended to discourage potential contributors. The latter problem was addressed when Hans Christian Ørsted became secretary of the Academy in 1815.

The very next year, he published the Academy's first official annual report, *Oversigt over Det Kongelige Danske Videnskabernes Selskabs Forhandlinger og dets Medlemmers Arbeider*

(An annual report on the Royal Danish Academy of Sciences and Letters' debates and the works of its members). Annual reports have been published ever since, under slight variations in title and greater variations in contents. The practice of annually informing the general public of the Academy's activities had begun in a small way in 1793, when the Academy began publishing *Bekiendtgiørelse fra det kongelige Videnskabernes Selskab i Kiøbenhavn* (Report from the Royal Danish Academy of Sciences and Letters in Copenhagen). To begin with, these short pamphlets contained only prize treatise topics, but they were gradually expanded, and in their final form would contain a quite thorough (although brief) report on the Academy's activities. Ørsted revised the concept, in particular by including summaries of the Academy's debates, including the scientific and scholarly communications. In doing so, he created a new and much faster publication channel than the *Writings*.

The other fundamental problem with the *Writings*, their extremely miscellaneous contents, was addressed by the Academy in 1820, when it voted to split the publication into two series: *Naturvidenskabelig og Mathematisk Afdeling* (The natural sciences and mathematics series) and *Philosophiske og Historiske Afhandlinger* (Philosophical and historical treatises). This division of the *Writings* lasted for over a century, from 1823, when the first volumes were published, until 1932.

Although the *Writings* and the *Annual Report* were exclusively published in Danish, there was some interest abroad in obtaining them. A network of publication exchange connections gradually emerged, and by the mid-1800s the Academy was regularly exchanging publications with about 30 academies in other countries. If they so wished, foreign members of the Academy could also have copies of the *Writings* and the *Annual Report* sent to them.

The major projects

But there was one work which contributed more to the Academy's reputation abroad than its regular publications: Frederik Ludvig Norden's account of his travels in Egypt and Nubia from 1737 to 1738. In 1732, King Christian VI had funded the young naval officer's educational travels around Europe, in the course of which he was to study shipbuilding and make drawings of everything which might be of interest to the Danish state. Norden sent numerous drawings of useful devices home, and was residing in Italy when the King ordered him to participate in an expedition to

FIGURE 7. Hans Christian Ørsted, the Academy's powerful secretary 1815-1851, painted by Nicolai Wilhelm Marstrand, 1851. The National History Museum of Denmark at Frederiksborg Castle. Photo: Hans Petersen.

Egypt, one objective of which was to establish trade connections with Ethiopia, in addition to describing the region in text and drawings.

Norden himself prepared the publication of this major work in French, but died before the text had been completely finalized and all of the copperplate engravings had been made. King Frederik V then transferred responsibility for the work's completion to the Academy. It turned out to be a protracted process beset by a string of problems, all of which were discussed at the Academy's meetings, at times in a decidedly sharp tone - many opinions can be held and expressed about paper quality, typography, and print runs.

After pressure from the King, the text of the first volume was printed in 1750. However, the complete work in two volumes was not printed until 1755, under the title *Voyage d'Égypte et de Nubie, par Mr. Frederic Louis Nor-*

FIGURE 8. Original drawing by F.L. Norden. In the printed work, Norden 1750-1755, the drawings were used for plate XXXIV, while the text is included in the body of the work. The Academy's archive.

den, Capitaine de vaisseaux du Roi. Ouvrage enrichi de Cartes & de Figures dessinées sur les lieux par l'Auteur même. This is a magnificent work with 159 copperplate engravings, renowned throughout Europe, a true contribution to the honor of the nation and the Academy – and a central work in the field of Egyptology.

The Academy failed to seize the opportunity to profit from this success; the copperplates were sold to an English printer who soon after published the first of numerous English editions, in 1757. The work was subsequently published in German and again in French, and was finally translated into Danish at the end of the century. While the Academy had no part in these editions, it has published Norden's work on two occasions in recent times: The Academy's 250th anniversary in 1992 was commemorated with an edition of Norden's original drawings, which the Academy still owns (Norden 1993), and Her Majesty Queen Margrethe II's 70th birthday was celebrated with a Danish translation of the work which contained all of the illustrations from the original edition (Norden 2010).

While still engaged in working on Norden's account of his travels, at the request of the King the Academy became involved in the planning and execution of a scientific expedition to completely different climes (read more p. 30-32). In 1751, two Icelandic students in Copenhagen, Eggert Ólafsson and Bjarni Pálsson, were given the task of travelling through Iceland and describing its geography, natural history and people. The Academy was very actively involved in the preparations for the expedition, and remained in close contact with Eggert Ólafsson and Bjarni Pálsson during their travels, which took place from 1752 to 1757. They sent reports and objects to Copenhagen, and received instructions and instruments in return. Their many notes were collated and edited by the Academy, which also handled the publication of this wide-ranging and multifacetted account of Iceland. Although it took some time, the results were worth the effort: In 1772, the two fat volumes were published: *Vice-Lavmand Eggert Olafsens og Land-Physici Biarne Povelsens Reise igiennem Island, foranstaltet af Videnskabernes Sælskab i Kiøbenhavn, og beskreven af forbemeldte Eggert Olafsen, med dertil hørende 51 Kobberstøkker og et nyt forfærdiget Kart over Island* (Deputy lawspeaker Eggert Ólaffson's and national physician Bjarni Pálsson's Travels in Iceland, organized by the Royal Danish Academy of Sciences and Letters in Copenhagen, and described by the aforementioned Eggert Ólaffson, with 51 copperplate engravings and a new map of Iceland). The work received considerable attention at home and abroad, and deservedly so; a German edition was published two years later, a French translation appeared in 1802, and an English one in 1805.

Although this achievement might seem to demonstrate the Academy's ability to lead scientific expeditions, the Academy was not involved at any stage in the great Danish expedition to 'Arabia Felix', which was launched in 1761.

The Academy was not commanded by the Crown to participate in the planning and execution of a major scientific expedition until the final years of absolutism,

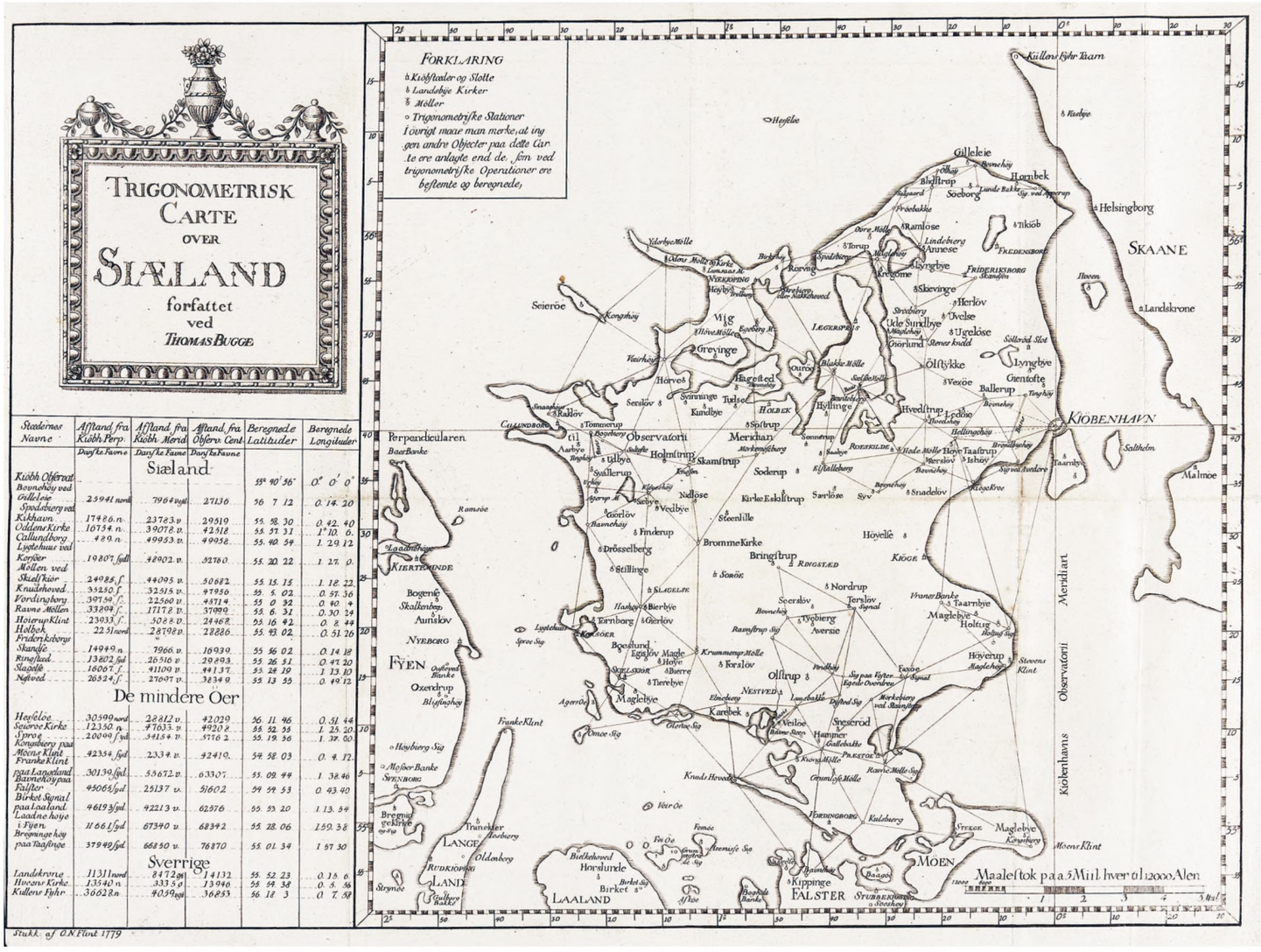


FIGURE 9. Trigonometric map of Zealand with the surveyed distances and calculated degrees of altitude and latitude. Plate in Bugge 1779.

the famous first Galathea expedition (see p. 33), which circumnavigated the globe between 1843 and 1845. The expedition was close to the heart of King Christian VIII, who was president of the Academy from 1838 to his death in 1848. While the expedition had various objectives, both political and scientific, science received most of the funding. In the course of their travels, the participating scientists collected crate after crate of botanical, zoological, and geological specimens, and they observed a wide variety of phenomena. The Academy had contributed in the selection of the expedition's participants, and when Galathea came home with her hold full of specimens, the King asked the Academy to supervise the distribution of these splendid objects.

By the mid-1700s, a topographical survey of Denmark was an urgent project of great military and economic significance. Existing maps were of poor quality, and new surveying techniques had been introduced – in France in particular – which were scientifically based. It seemed like an obvious task for the Academy to become involved in this great undertaking, and in 1757, a university student named Peder Koefoed actually presented a plan to the Academy; unfortunately, he died before it could be realized (read more p. 26-28).

But the idea had been conceived, and in 1761, the Academy presented a proposal for the survey to the King, which resulted in a royal resolution of June 26th 1761 that gave the Academy sole responsibility for this colossal project. The most modern methods were to be employed: surveying in the field, triangulation, and determination of positions through astronomical observation. The resolution initiated a comprehensive and complex project. The project's employees were to be given instruction in astronomy, theoretical and practical geometry, hydrography and drafting. The Round Tower Observatory in Copenhagen was reno-

vated as a base for the survey, and an experienced instrument maker was brought over from Sweden. The Academy established a surveying commission to supervise the work, and regular reports were to be given at the Academy's meetings.

The survey began in 1762, very conveniently starting with sites right outside the city gates of the capital. Until 1809, the team of surveyors and assistants worked their way first through Zealand, and afterwards through the rest of the kingdom and the Duchy of Schleswig. The survey of Holstein was not carried out by the Academy, although it had been included in the plan at one point. The survey was complex and involved much painstaking work in the field. Local farmers were commanded to provide the surveying team with wagons, horses, food and lodging, requests which were not infrequently met with disgruntlement, even though the surveyors were expressly enjoined to exercise "all possible caution, so that the grain is damaged as little as possible".

After the survey was complete, the final versions of the topographical maps were to be drafted, the copperplates were to be prepared, and finally the completed maps were to be printed. The entire process had to be supervised closely, because anything could go wrong. The Academy itself was able to handle some of the problems that arose but war and unrest took their toll; in particular, the Bombardment of Copenhagen in 1807 was catastrophic, even though the irreplaceable documents and records were saved in the last hectic days, when the British Navy's preparations for the bombardment could be observed from behind the city's fortifications. The bombardment caused major fires throughout the city, which led the authorities to a decision to close the Round Tower Observatory and instead establish a fire station which could monitor the entire city from the tower. Despite its status as a servant of the state, the Academy fought this plan vehemently, asserting itself as the champion of science – and the Academy won: the plan was abandoned.

The maps were published over the course of many years: the first map, of the northern environs of Copenhagen, was published in 1766, and the last, a map of the entire Kingdom of Denmark and the Duchy of Schleswig, was published in 1841. They sold extremely well and found all kinds of useful applications, nationally and locally, by the authorities and private individuals. They attracted attention abroad, and during the Napoleonic Wars, the French government requested the survey of Schleswig-Holstein, which it received on the King's orders.

The salary paid to the employees of the project was so modest that it could not support a family. Nonetheless, the Academy succeeded in retaining several exceptional people, including Caspar Wessel. Thomas Bugge, who was originally a theologian, started out as a surveyor and ultimately became the director of the entire project, a member of the Academy as well as its secretary for many years. Many of his publications were directly derived from the topographical survey.

When the general map of the kingdom and Schleswig was finished in 1841, the Academy discussed whether to continue its engagement in the survey. A recommendation to the King was adopted by a narrow majority. It enumerates the difficulties and expenses of continuing the project, and concludes circumspectly:

> Therefore, it appears that an Academy such as ours, whose primary purpose is the advancement of science and scholarship, is not well suited to an enterprise such as the continuation of the work of surveying and preparing maps referred to here; as it is more a matter of the application of known scientific techniques by means of suitable administrative measures than of new scientific studies.

The King agreed, and thus the Academy's involvement in the mapping of Denmark ceased. In relation to military applications, it was a serious problem that the Academy's maps do not indicate differences in elevation, and the new measurements were entrusted to the general staff, which also took over the existing maps and their sale.

While the Academy's maps represented great progress, they were not above criticism. Contemporaries were particularly critical of the slow pace of production, which was primarily due to the small size of the annual grants which funded the project. But more seriously, the quality of the maps is uneven; in particular, there are an unacceptably large number of errors in the map of Bornholm, which was published in 1805. Bugge's work was strongly criticized by among others H.C. Ørsted, and doubts about the reliability of his measurements and calculations clung to his work for a long time. However, a thorough study of all of the extant material in 1968 rehabilitated Bugge and his efforts (Andersen 1968).

The survey of Denmark had neither exhausted the Academy's energies nor frightened it off new large projects. In 1776, it was decided that the Academy should take on the project of publishing the first com-

FIGURE 10. The Royal Danish Academy of Sciences and Letters' map of mid-eastern Jutland including Samsø, published in 1789.

The Danish Geodata Agency.

prehensive Danish dictionary. Several handwritten drafts existed. Two of the Academy's members in particular, Frederik Rostgaard and Jacob Langebek, had left behind them comprehensive collections, and to begin with the Academy intended to complete their work. Fortunately, the largest and best existing dictionary, Matthias Moth's manuscripts, would later be included in the project as well, and thanks to their unusually high quality and scope, they would ultimately constitute the most important foundation of the new dictionary.

The organization of the work was the subject of much discussion in the Academy. The original concept had been a dictionary with a primary emphasis on describing the Danish language but which also provided Latin translations for each headword. This plan was thwarted by the government – that is to say, by the Crown Prince, later King Frederik VI – who commanded that "the dictionary must be in the country's own language, and must be equally valued by scholars and laymen alike". So it was decided that the definitions would be in Danish. The dictionary was to cover the general vocabulary broadly, it was to be organized alphabetically and include information on the origins of the words, but only a few examples were to be included –without indicating their source or providing information on language use.

The Academy established a commission to supervise the work closely, and an editor was selected – Ole Strøm, who was Norwegian. Characteristically for the double monarchy's conception of language, there were no reservations about his selection. The process of composition was complicated: the editor prepared a draft on the basis of the manuscripts of Moth, Rostgaard, and Langebek, which was then supplemented by excerpts from a number of sources, especially more recent ones; after which the first draft was submitted to the commission, whose members contributed their individual comments and additions to the draft. Next, the manuscript was returned to the editor, who prepared the manuscript for printing. The number of supplementary sources continued to increase over the lifespan of the dictionary, but the three old manuscripts remained its foundation.

The first installment, the letter A, was printed in 1780. Like subsequent installments, it lacked both a preface and a dedication, which provoked a considerable number of critical questions from the public about the dictionary's basic principles, publication schedule and contributors. On behalf of the dictionary commission, the editor informed the public that such information could only be provided when the work was completed.

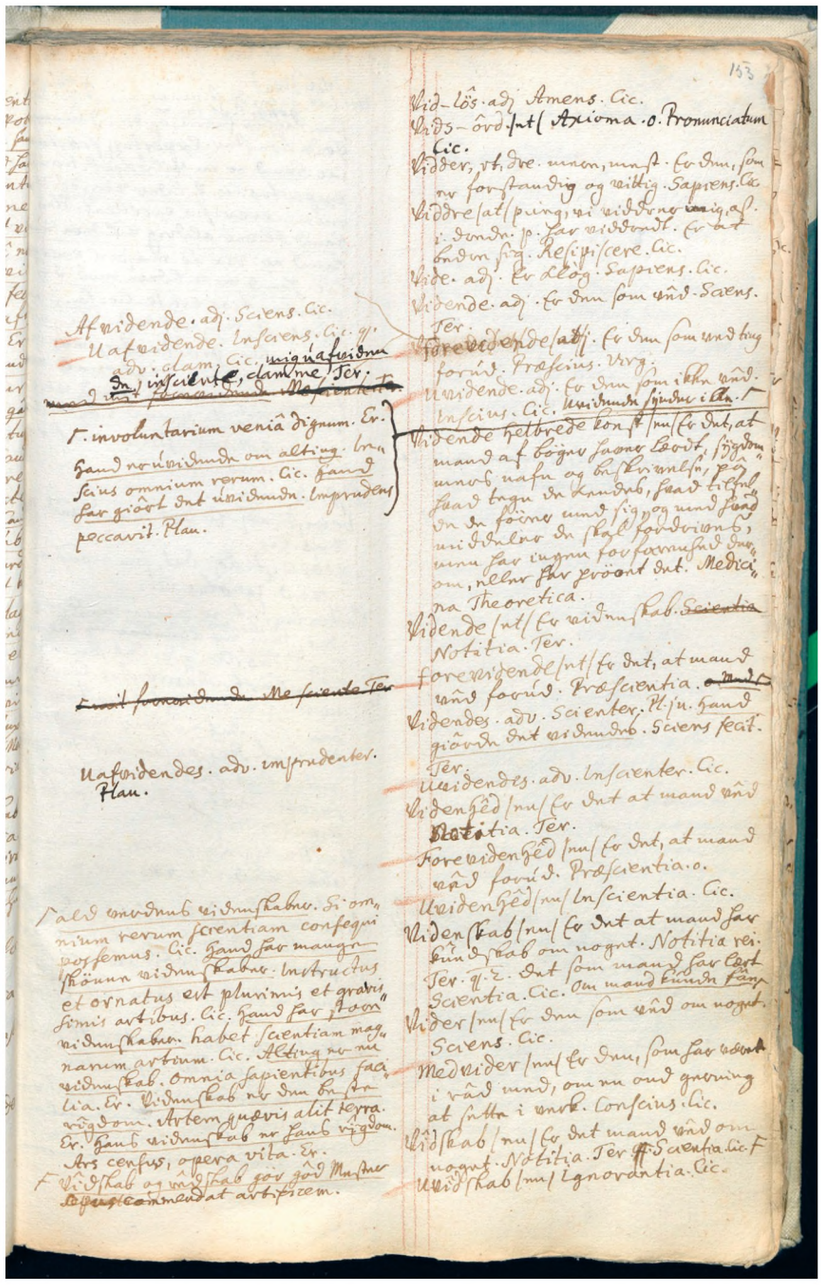
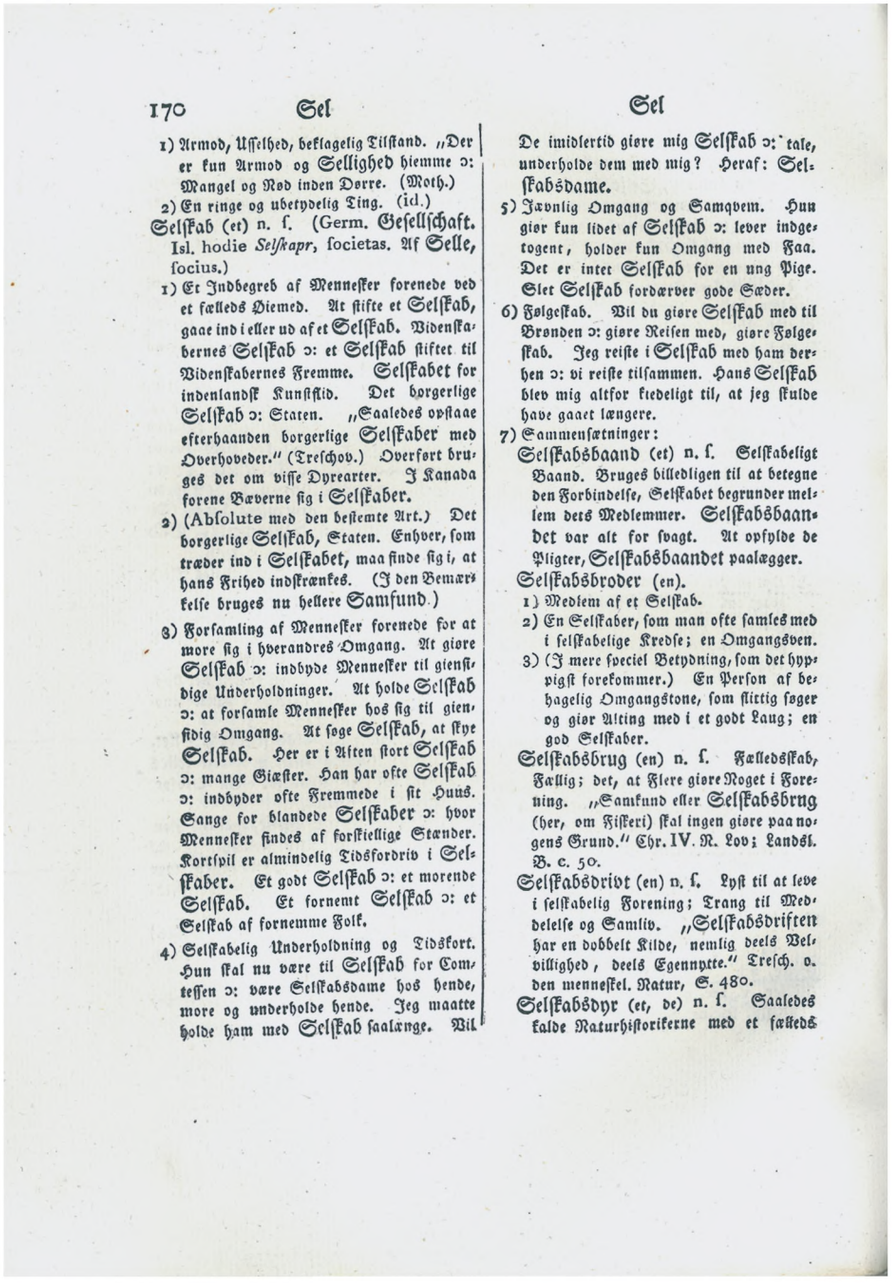


FIGURE 11. Page from Matthias Moth's manuscript dictionary from 1713. The entry on 'science/scholarship' (videnskab), which covers both columns, is at the bottom of the page. The entire entry can be read in Danish at mothsordbog.dk. The modern meaning of the word, 'methodical, critical research based on evidence', dates from after Moth's death in 1719, and is first recorded in Danish in the work of Ludvig Holberg (1684-1754). The manuscript Gammel Kongelig Samling (old royal collection) 774, fol., volume XVI, p. 153. The Royal Library.

The entire first volume, which includes the letters from A to E, was published in 1793 under the title *Dansk Ordbog udgiven under Videnskabernes Selskabs Bestyrelse* (Danish dictionary published under the direction of



170 Sel Sel

1) Armod, Usselhed, beklagelig Tilstand. „Der er kun Armod og Sellighed hiemme o: Mangel og Nød inden Dørre. (Moth.)
2) En ringe og ubetydelig Ting. (id.)

Selskab (et) n. s. (Germ. Gesellschaft. Isl. hodie *Selskapr*, societas. Af Selle, socius.)
1) Et Indbegreb af Mennesker forenede ved et fælleds Hiemed. At stifte et Selskab, gaae ind i eller ud af et Selskab. Videnskabernes Selskab o: et Selskab stiftet til Videnskabernes Fremme. Selskabet for indenlandsk Kunstflid. Det borgerlige Selskab o: Staten. „Saaledes opstaae efterhaanden borgerlige Selskaber med Overhoveder." (Treschow.) Overført bruges det om visse Dyrearter. I Kanada forene Bæverne sig i Selskaber.
2) (Absolute med den bestemte Art.) Det borgerlige Selskab, Staten. Enhver, som træder ind i Selskabet, maa finde sig i, at hans Frihed indskrænkes. (I den Bemærkelse bruges nu hellere Samfund.)
3) Forsamling af Mennesker forenede for at more sig i hverandres Omgang. At gjøre Selskab o: indbyde Mennesker til gienstidige Underholdninger. At holde Selskab o: at forsamle Mennesker hos sig til gienstidig Omgang. At søge Selskab, at skye Selskab. Her er i Aften stort Selskab o: mange Gjæster. Han har ofte Selskab o: indbyder ofte Fremmede i sit Huus. Gange for blandede Selskaber o: hvor Mennesker findes af forskiellige Stænder. Kortspil er almindelig Tidsfordriv i Selskaber. Et godt Selskab o: et morende Selskab. Et fornemt Selskab o: et Selskab af fornemme Folk.
4) Selskabelig Underholdning og Tidsfort. Hun skal nu være til Selskab for Comtessen o: være Selskabsdame hos hende, more og underholde hende. Jeg maatte holde ham med Selskab saalænge. Vil De imidlertid gjøre mig Selskab o: tale, underholde dem med mig? Heraf: Selskabsdame.
5) Jævnlig Omgang og Samqvem. Hun gior kun lidet af Selskab o: lever indgetogent, holder kun Omgang med Faa. Det er intet Selskab for en ung Pige. Slet Selskab fordærver gode Sæder.
6) Følgeskab. Vil du gjøre Selskab med til Byen o: gjøre Reisen med, gjøre Følgeskab. Jeg reiste i Selskab med ham derhen o: vi reiste tilsammen. Hans Selskab blev mig altfor kiedeligt til, at jeg skulde have gaaet længere.
7) Sammensætninger:

Selskabsbaand (et) n. s. Selskabeligt Baand. Bruges billedligen til at betegne den Forbindelse, Selskabet begrunder mellem dets Medlemmer. Selskabsbaandet var alt for svagt. At opfylde de Pligter, Selskabsbaandet paalægger.

Selskabsbroder (en).
1) Medlem af et Selskab.
2) En Selskaber, som man ofte samles med i selskabelige Kredse; en Omgangsven.
3) (I mere speciel Betydning, som det hyppigst forekommer.) En Person af behagelig Omgangstone, som flittig søger og gior Alting med i et godt Laug; en god Selskaber.

Selskabsbrug (en) n. s. Fælledskab, Fællig; det, at Flere gjøre Noget i Forening. „Samkund eller Selskabsbrug (her, om Fiskeri) skal ingen gjøre paa nogens Grund." Chr. IV. N. Lov; Landsl. B. c. 50.

Selskabsdriot (en) n. s. Lyst til at leve i selskabelig Forening; Trang til Meddelelse og Samliv. „Selskabsdriften har en dobbelt Kilde, nemlig deels Velvillighed, deels Egennytte." Tresch. o. den menneskel. Natur, S. 480.

Selskabsdyr (et, de) n. s. Saaledes kalde Naturhistorikerne med et fælleds

FIGURE 12. Page from *Dansk Ordbog udgiven under Videnskabernes Selskabs Bestyrelse* (Danish dictionary published under the direction of the Royal Danish Academy of Sciences and Letters), volume VI. The page includes the detailed entry for the word 'academy/society' (selskab), and one of the examples of meaning 1 is the Royal Danish Academy of Sciences and Letters (Videnskabernes Selskab). VSO VI, p. 170.

the Royal Danish Academy of Sciences and Letters), commonly referred to as Videnskabernes Selskabs Ordbog or VSO. Volume II, F-H, was published in 1802, just as lacking in information as volume I. A cautious gesture towards enlightening the wondering public was printed on the title page of the first installment of volume III from 1808 – primarily an explanation of why the production of the dictionary was proceeding so slowly.

In 1806, the project hired its first qualified linguist, Christian Molbech, which improved its quality considerably. He worked on the dictionary until his death, first as an assistant, and subsequently as editor, member of the commission and finally its chair. Although he contributed a large amount of good work to the project, he was constrained by the principles which had been adopted before he was born.

Like the map project, the dictionary was dealt a heavy blow by the 1807 bombardment. Despite hectic attempts to save the irreplaceable old dictionary manuscripts, several of them were burned.

In 1820, Volume III was published, I-L, including the long-awaited preface, which provides an account of the work's history, principles, and supplementary materials. Moth's dictionary is cited as the most important source of the VSO, which is rather sensational considering that 100 years had passed since the author's death; both the language and lexicography had developed considerably during that period. The remaining installments of the dictionary were published at long and irregular intervals – the most protracted dictionary project in Denmark to date. It concluded with Volume VIII in 1905, after five years of preparatory work, a production time of 125 years, 2,115 editorial meetings and untold man-years on the part of employees and commission members. Along the way, the question of cancelling the project or at the very least modernizing it had been discussed innumerable times, but aside from the continued inclusion of new sources, the dictionary's authors reluctantly carried on under the guidelines which had been established from the beginning. In the despondent words of the preface to the last volume of the dictionary:

> the circumstance that it ... has accepted the greater part of the material gathered in Moth's large manuscript dictionary will always give it a special value.
>
> It must now be the task of others to produce a new and more complete dictionary of our mother tongue in accordance with the requirements of contemporary linguistics.

This wish was realized by *Ordbog over det danske Sprog* (Dictionary of the Danish language), worked out by The Society for Danish Language and Literature, being planned already when the VSO was completed. But that story lies outside the Academy's own history.

International collaboration – the first steps

A transit of Venus across the Sun is a rare event in which Venus becomes visible against the solar disk. This event has historically been of great importance to astronomy, because it is possible to estimate the distance between the Earth and the Sun by combining observations of the duration of the transit from widely separated positions. Two transits of Venus took place in the 18th century, in 1761 and 1769.

On the occasion of the first transit, astronomers in Paris coordinated observations from all over the globe, including in Copenhagen and Trondheim. In both places, the observations were a failure on account of bad weather and poor instruments, and Danish astronomy gained a reputation as being underdeveloped. To prevent an embarrassing recurrence, the King summoned two astronomers from Vienna, Maximilian Hell and Johann Nepomuk Sajnovics. After a stay in Copenhagen in the fall of 1768, they travelled to Vardøhus, the northernmost point in the King's dominions, where a suitable observatory could be erected. They completed their task and performed reliable observations of the transit, which took place in June 1769. At meetings of the Academy, Hell presented these observations, which were published in the *Writings* in Danish in 1770. Hell published them in Latin the same year. As a result, the reputation of Danish astronomy was somewhat restored, and in the years that followed, the Academy organized a number of prize treatise competitions on astronomical topics which received international attention and which resulted in gold medals for a number of foreign researchers.

The expedition to Vardø also produced an unexpected side benefit within a completely different branch of science. Sajnovics, who was Hungarian, whiled away the long wait by studying the Saami, and to his own surprise, he discovered that he understood their language to some extent. This motivated him to make a systematic study of not only vocabulary, which was the foundation for comparative linguistics at the time, but also of the phonetic and grammatical system.

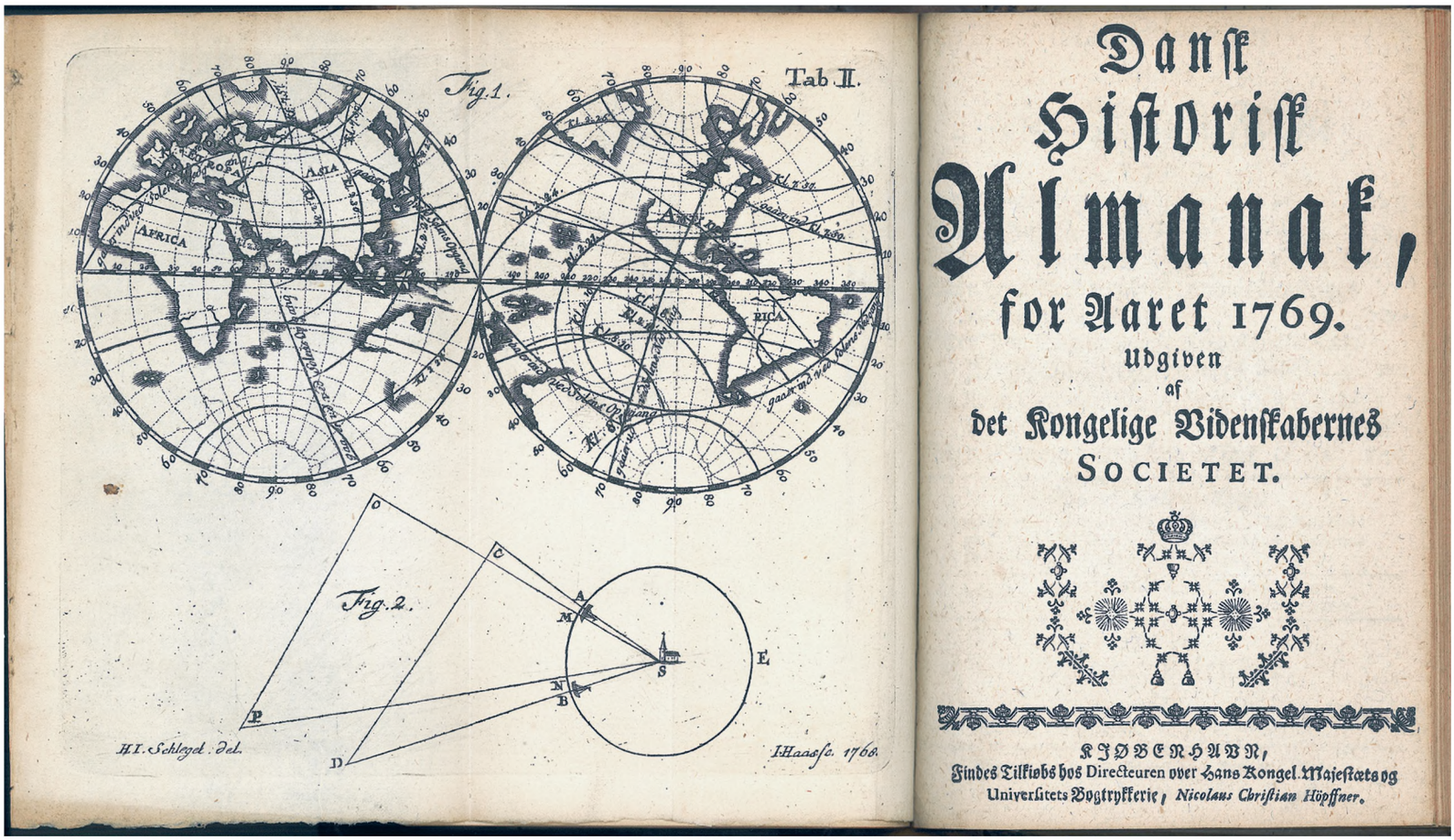
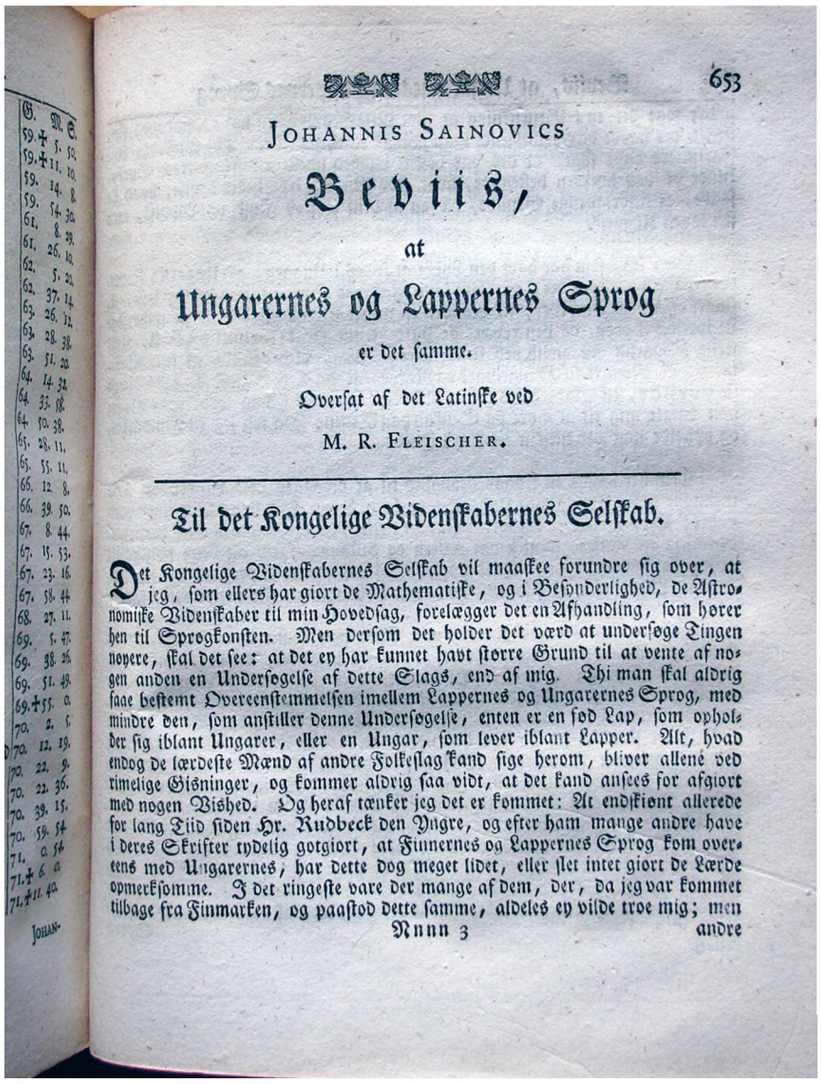


FIGURE 13. The passage of Venus in 1769 with indications of when the planet Venus was observed in front of the Sun's disk from different observation points, and an explanatory diagram of the method of measurement. Plate in *Dansk Historisk Almanak* (Danish historical almanac), 1769.



653

JOHANNIS SAINOVICS

Bevis,

at

Ungarernes og Lappernes Sprog

er det samme.

Oversat af det Latinske ved

M. R. FLEISCHER.

Til det Kongelige Videnskabernes Selskab.

Det Kongelige Videnskabernes Selskab vil maaskee forundre sig over, at jeg, som ellers har giort de Mathematiske, og i Besynderlighed, de Astronomiske Videnskaber til min Hovedsag, forelægger det en Afhandling, som horer hen til Sprogkonsten. Men dersom det holder det værd at undersoge Tingen noyere, skal det see: at det ey har kunnet havt større Grund til at vente af nogen anden en Undersogelse af dette Slags, end af mig. Thi man skal aldrig saae bestemt Overeenstemmelsen imellem Lappernes og Ungarernes Sprog, med mindre den, som anstiller denne Undersogelse, enten er en fød Lap, som opholder sig iblant Ungarer, eller en Ungar, som lever iblant Lapper. Alt, hvad endog de lærdeste Mænd af andre Folkeslag kand sige herom, bliver allene ved rimelige Gisninger, og kommer aldrig saa vidt, at det kand ansees for afgiort med nogen Vished. Og heraf tænker jeg det er kommet: At endskiont allerede for lang Tiid siden Hr. Rudbeck den Yngre, og efter ham mange andre have i deres Skrifter tydelig gotgiort, at Finnernes og Lappernes Sprog kom overens med Ungarernes; har dette dog meget lidet, eller slet intet giort de Lærde opmerksomme. I det ringeste vare der mange af dem, der, da jeg var kommet tilbage fra Finmarken, og paastod dette samme, aldeles ey vilde troe mig; men

FIGURE 14. The first page of Johann Nepomuk Sajnovics' ground-breaking treatise on the similarities between Hungarian and Saami, Sajnovics 1770a, p. 653.

He presented his observations at a meeting of the Academy, which recognized the ground-breaking nature of his results and had them published in Danish in the *Writings* in 1770. Once he had returned to his home in Tyrnau, he published his treatise in Latin. It is considered to be a central work in the study of the Finno-Ugric family of languages and has been republished in modern times.

Research policy: prize treatises and financial support

Neither the observations of the transit of Venus nor the study of Saami took place on the initiative of the Academy. However, the Academy did not adopt a passive stance on issues of research policy. It had been decided in connection with the establishment of the Academy that one of its members' responsibilities was to identify topics which required exploration. The selection of treatises for publication in the *Writings* is also an expression of a desire to influence the development of science and scholarship, and in the late 1760s, these efforts took a new form: prize treatise competitions. For learned societies, this was a generally recognized method of influencing the development of research – and of positioning themselves in the international scientific and scholarly community. In 1767, the Academy received a royal grant to fund prizes for excellent submissions to three annual prize treatise competitions that the Academy was to hold in the subjects of history, mathematics, and physics. It was decided that the prize was to take the form of a gold medal, perhaps accompanied by a monetary award.

The formulation of the prize treatise topics immediately gave rise to lively discussions. For example, one of the proposed topics, the question of the *primus motor* of movement in people and animals, received the following comment: "*Problema Physicum* is subtle and will be difficult if not impossible to solve, at least for the first time", which received the reply "Perhaps not even in the next world".

The prize treatise competitions played a central role in the life of the Academy for the next 200 years. The practical framework changed, but the central task – the formulation of the questions and the assessment of the submissions – continued to occupy the members and were the subject of intense discussions. The field of subjects was expanded in 1795 to include prize treatise topics in philosophy. The prize treatise topics were published in learned periodicals all over Europe, and for over 100 years, the majority of the submissions came from foreign researchers. Only a minority of the submissions received prizes, and even fewer were published, and often without the participation of the Academy. When the Academy began printing its annual reports, abstracts of the prize treatises became a permanent feature, along with the new prize treatise topics.

Interest in these competitions varied considerably over the course of the approximately two centuries in which they existed. On several occasions, as the unanswered topics continued to pile up, H.C. Ørsted drew attention to the fact that modern researchers prefer to formulate their research topics themselves, and that they are not interested in waiting for the results of a slow assessment process, the results of which are uncertain at that. Nonetheless, he emphasized that the

competitions could provide an occasion for excellent -occasionally even ground-breaking - treatises. After 1870 the number of submissions increased, but the economic crisis after the First World War resulted in fewer competitions at irregular intervals. In 1972, the Academy voted to terminate the prize treatise competitions. The old tradition was revived just once on the occasion of the Academy's 250th anniversary in 1992.

The topics of the treatises reflect the development of the Academy, and of science and scholarship, quite accurately. In the early years, a number of primarily practical problems were set, which were to be solved to the obvious benefit of society. For example, the mathematics topic for 1773 was "to invent a machine or mechanical artifice by which freshwater lakes and waters can easily and without great cost be cleaned and liberated from mud, impurity and aquatic plants". But by the end of the century, the topics had already become more theoretical in nature, while at the same time the Academy was entrusted with two grants by means of which it could be of more direct use to society: Thott's grant in 1785 and Classen's grant in 1792. Both grants were intended to reward prize treatises on the subject of agriculture and forestry, and the prize was a sum of money.

Two of the many treatises submitted are worthy of special mention here. In 1810, the Academy's prize treatise topic concerned the source from which the old Norse languages were most likely derived. After considerable postponement of the deadline, a single entry was received in 1815 - and it turned out to be worth waiting for: it was the ground-breaking *Undersøgelse om det gamle Nordiske eller Islandske Sprogs Oprindelse* (Inquiry into the origin of the old Norse or Icelandic language) by Rasmus Rask (see also p. 107s.). The treatise is described with great precision in the Academy's assessment:

> The author is Mr. Rask, who is already favorably known from his previous works on the old language of the North. The present work contains a comprehensive comparison between this [Old Norse] and the most important older and newer European languages, including their various dialects. The author does not confine himself to a consideration of the resemblances in vocabulary between these languages, through which it can only be determined with difficulty whether the similarity is the result of foreign influence or a common origin. The structure of the languages is the object of his particular attention. Their grammar is more important to him than the names they assign to things. However, these [names] also become important to him when the languages share the most important and most indispensable words, which it is most difficult to assume to have been borrowed, and especially when the correspondences are so numerous and mutually related with one another that laws governing the transmutation of letters can be stated.


Trende Besvarelser

af den

af det Kongelige danske Videnskabernes Selskab

udsatte Priisopgave

om

Hesteveddeløbenes og den dermed forbundne Trainerings Indflydelse paa Danmarks Hesteavl.

Udgivne af Selskabet.

Kjøbenhavn.

Trykt hos Bianco Luno & Schneider.

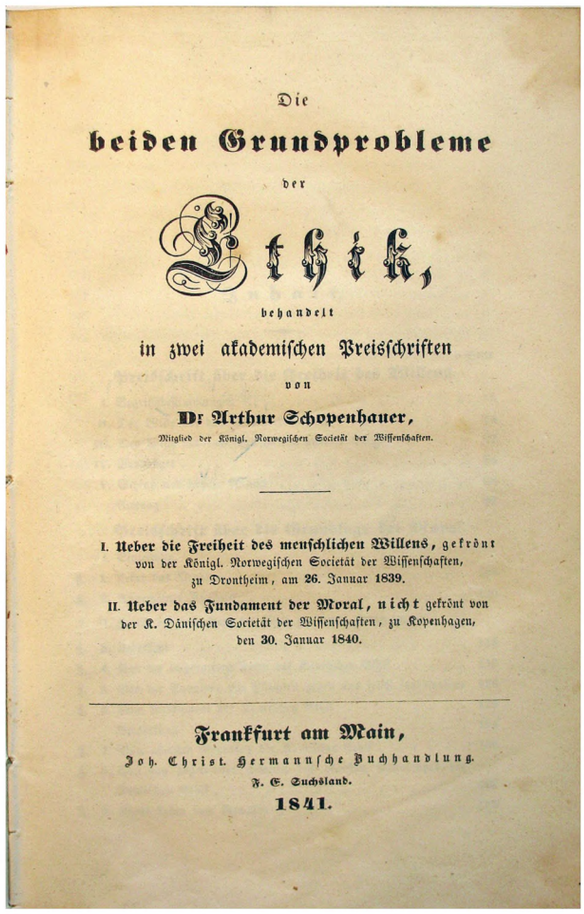
1835.

FIGURE 15. Edition of the prize-winning submission in the Academy's prize treatise competition on 'Hesteveddeløbenes og den dermed forbundne Trainerings Indflydelse paa Danmarks Hesteavl' (The influence of horse racing and the associated training on horse breeding in Denmark), 1835. The prize essay question reflects then-president Adam Wilhelm Hauch's particular interest in the question; he was director of the royal stables.

This treatise founded modern comparative linguistics, which determines whether languages are related through comparative analysis of phonetic and grammatical structures. The Academy awarded the gold medal to Rask's treatise, and it was published in its entirety in 1818 without the participation of the Academy; Rask insisted on using his own orthography in all of his writings, and this was incompatible with the Academy's language policy.

While in this case the prize treatise brought honor to the Academy (apart from its spelling requirements), the philosophical prize treatise competition in 1837 ended in scandal. Only one treatise was submitted, anonymously as was always the case, and it was re-

FIGURE 16. The title page of Arthur Schopenhauer's two treatises on the foundations of morality, in which the incompetence of the Academy is put on display for all the world to see. Schopenhauer 1841, p. 1.



Die

beiden Grundprobleme

der

Ethik,

behandelt

in zwei akademischen Preisschriften

von

Dr Arthur Schopenhauer,

Mitglied der Königl. Norwegischen Societät der Wissenschaften.

I. Ueber die Freiheit des menschlichen Willens, gekrönt von der Königl. Norwegischen Societät der Wissenschaften, zu Drontheim, am 26. Januar 1839.

II. Ueber das Fundament der Moral, nicht gekrönt von der K. Dänischen Societät der Wissenschaften, zu Kopenhagen, den 30. Januar 1840.

Frankfurt am Main,

Joh. Christ. Hermannsche Buchhandlung.

F. E. Suchsland.

1841.

jected in harsh terms by the Academy's philosophy members, among other reasons because it was extremely critical of Georg Wilhelm Friedrich Hegel, who was considered the leading philosopher of the age in Copenhagen. However, the author was none other than Arthur Schopenhauer, who had certainly not expected a rejection. He took his revenge by publishing the treatise "Ueber das Fundament der Moral", with the subtitle "nicht gekrönt von der K. Dänischen Societät der Wissenschaften, zu Kopenhagen". As an additional refinement, the treatise was published together with another work which had received a prize from the Royal Norwegian Academy of Sciences and Letters in Trondheim (Schopenhauer 1841). A long preface blasts the Academy in Copenhagen, which to make matters worse had neglected to inform Schopenhauer of its assessment of his treatise.

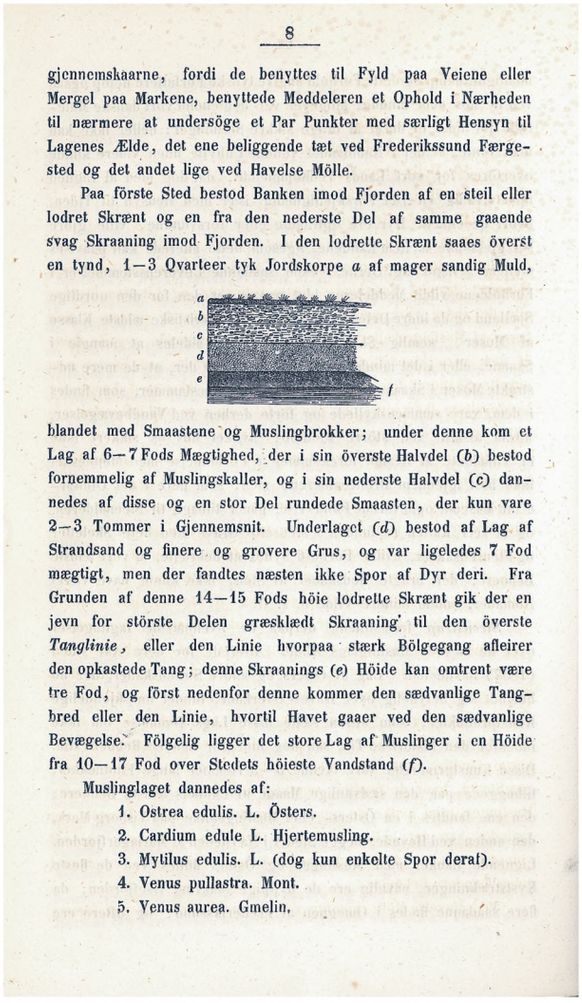
In the period from about 1820 until the establishment of the Carlsberg Foundation in 1876, the Academy functioned as a research foundation to a certain degree, accepting applications for various research initiatives in a wide variety of subjects which it then supported with its own funds. Individuals benefitted in particular from this patronage, which financed scientific equipment and supported early career researchers and Danish researchers abroad, including Peter Wilhelm Lund during his many years of research in Brazil. In parallel with the prize treatise competitions, these activities were an important research policy tool even under absolutism. During the period of national romanticism, it is clear that the Academy helped advance research on topics such as the Scandinavian languages, pre-Christian Scandinavian religion, the poetry of the Middle Ages - in short: the historical roots of the nation, which were understood as the very foundation of the present, and the necessary precondition for a people's ability to comprehend itself and hereby realize its true being in a harmonious existence for society as a whole. The Academy's members participated very actively in the cultural life of the time, and the Academy itself funded publications such as Christian Molbech's 1828 edition of the medieval Danish translation of the Bible, *Den ældste danske Bibel-Oversættelse eller det gamle Testamentes otte første Bøger* (The oldest Danish Bible translation, or the first eight books of the Old Testament).

The Academy also threw itself into more challenging projects. For historical research, the most significant of these projects was probably a comprehensive overview of older documents and letters, *Chronologisk Fortegnelse over hidtil trykte Diplomer og andre Brevskaber til Oplysning af den danske Historie fra de ældste Tider indtil Aar 1660* (Chronological register of previously printed diplomas and other letters for the illumination of Danish history from earliest times until the year 1660), which was published in two volumes between 1847 and 1870, to which two supplementary volumes were added between 1880 and 1907. The long publication time gives an impression of the scope and difficulty of the project. This useful work is generally referred to by the first word of its Latin title, *Regesta Diplomatica Historiae Danicae*. The publication of *Regesta* was an ambitious project, and the Academy wisely refrained from the even more demanding project of publishing the full texts. For the early Middle Ages, this project was realized with the *Diplomatarium Danicum*, which was begun by The Society for Danish Language and Literature in 1931 and is still in progress - but without the involvement of the Academy.

With regard to archaeology, the appointment of the Academy's so-called 'kitchen midden commission' would have a ground-breaking influence. The commission was created at the meeting of January 7th 1848, after the zoologist Japetus Steenstrup had presented a

paper on "some observations he had made regarding the time at which certain raised layers of oyster and mussel shells were formed, and regarding the conditions of nature and culture which existed at that time in this country" (Steenstrup 1849). In addition to Steenstrup, the chemist Johan Georg Forchhammer and the archaeologist Jens Jacob Asmussen Worsaae joined the commission, which for the next twenty years would examine the strange mounds with the constant support of the Academy and regular reports in the *Annual Report*. The investigation revealed that the mounds contained animal bones in addition to shells, which led Worsaae to the conclusion that they had not been formed by natural processes, but were rubbish heaps from prehistoric settlements. Steenstrup coined the term 'kitchen midden', which is still the internationally accepted term for the phenomenon. The commission was the Academy's most important contribution to archaeology in the 19th century, in part because of its results, and in part - and especially - because of its interdisciplinary methodology.

With the death of King Christian VIII on January 20th 1848, the Academy lost its King, its protector, and its president at one fell swoop. This singular union of the Academy's highest offices had been brought about by H.C. Ørsted, whose importance to the Academy in the 19th century can hardly be overestimated. His influence as a researcher, teacher, communicator, entrepreneur, and organiser reached far outside the Academy's walls, and he elevated the Academy to an influential position in society. It was his close relationship to Crown Prince Christian Frederik which ensured the Prince's election as president in 1838. Both before and after his accession to the throne a year later, Christian VIII was genuinely engaged in the Academy's work. The lustre he lent to the Academy helped it reach the highest position it would hold under absolutism, shortly before this form of government was overthrown.



8

gjennemskaarne, fordi de benyttes til Fyld paa Veiene eller Mergel paa Markene, benyttede Meddeleren et Ophold i Nærheden til nærmere at undersöge et Par Punkter med særligt Hensyn til Lagenes Ælde, det ene beliggende tæt ved Frederikssund Færgested og det andet lige ved Havelse Mölle.

Paa förste Sted bestod Banken imod Fjorden af en steil eller lodret Skrænt og en fra den nederste Del af samme gaaende svag Skraaning imod Fjorden. I den lodrette Skrænt saaes överst en tynd, 1—3 Qvarteer tyk Jordskorpe *a* af mager sandig Muld,

blandet med Smaastene og Muslingbrokker; under denne kom et Lag af 6—7 Fods Mægtighed, der i sin överste Halvdel (*b*) bestod fornemmelig af Muslingskaller, og i sin nederste Halvdel (*c*) dannedes af disse og en stor Del rundede Smaasten, der kun vare 2—3 Tommer i Gjennemsnit. Underlaget (*d*) bestod af Lag af Strandsand og finere og grovere Grus, og var ligeledes 7 Fod mægtigt, men der fandtes næsten ikke Spor af Dyr deri. Fra Grunden af denne 14—15 Fods höie lodrette Skrænt gik der en jevn for störste Delen græsklædt Skraaning til den överste *Tanglinie*, eller den Linie hvorpaa stærk Bölgegang afleirer den opkastede Tang; denne Skraanings (*e*) Höide kan omtrent være tre Fod, og först nedenfor denne kommer den sædvanlige Tangbred eller den Linie, hvortil Havet gaaer ved den sædvanlige Bevægelse. Følgelig ligger det store Lag af Muslinger i en Höide fra 10—17 Fod over Stedets höieste Vandstand (*f*).

Muslinglaget dannedes af:

1. Ostrea edulis. L. Östers.
2. Cardium edule L. Hjertemusling.
3. Mytilus edulis. L. (dog kun enkelte Spor deraf).
4. Venus pullastra. Mont.
5. Venus aurea. Gmelin.

FIGURE 17. The earliest representation of the structure of a kitchen midden with a detailed explanation of the composition of the individual layers. Steenstrup 1848, p. 8.

The Academy in a democratic society - 1848-1945

The transitional period

The first upheaval in the Academy's internal history after the death of Christian VIII was the presidential election. For the first time ever, a professional researcher was elected: Anders Sandøe Ørsted, who had a decisive influence on Danish jurisprudence. However, this break with the practice of early times was not absolute, as he was also a prominent government official and an influential politician. Although the Academy as such did not participate in the political unrest of 1848-1849, it is remarkable that almost a third of its members participated in the constitutional assembly- several of whom would pursue careers in politics in the turbulent years after the introduction of democracy.

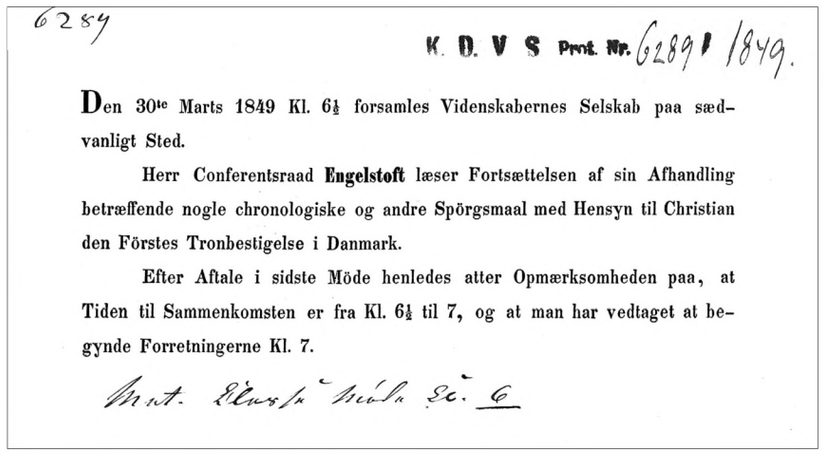
Under the new Constitution, the Academy was no longer a government body, but a private association. The new reality made itself felt gradually. H.C. Ørsted, the Academy's secretary since 1815 - and its driving force for just as long - died in 1851. His brother A. S. Ørsted continued on as president until his death ten years later, at which point the Academy stopped electing a successor. This was a consequence of the problematic fact that the Academy, unlike the country, had no constitution: the royal rescript which had constituted the Academy's legal framework after the fall of Struensee presupposed an absolutist monarch as its highest authority, which meant that it was not only no

FIGURE 18. Japetus Steenstrup, painting by August Andreas Jerndorff, 1885. The National History Museum of Denmark at Frederiksborg Castle. Photo: Hans Petersen.

longer valid, it was inapplicable. The reorganization of the Academy to adapt it to the new situation would not begin until the election of Japetus Steenstrup as secretary in 1865.

It was decisive for the Academy's possibility to act that Steenstrup managed to get its members to elect a president in 1867, after a seven-year vacancy. A secretariat was established the same year. The two employees of the secretariat were to deal with some of the practical tasks, especially in connection with publications; exchange agreements with foreign academies multiplied in the 19th century, so that by 1875 there were about 200.

With this increased international contact, the problematic choice to publish exclusively in Danish came into question. H.C. Ørsted had insisted that the Academy only publish in Danish as an absolute requirement; he considered it the Academy's duty to participate in the development of Danish as a language of science and scholarship, and the members' interest in the mother tongue had been whetted by the Academy's Danish dictionary project. The motivation for the rejection of Rask's special orthography (see p. 72) can be traced to this engagement in questions of language policy. But when Ørsted died, the Academy lost its most prominent champion of the Danish language, and romantic nationalism had been hopelessly compromised by the Danish defeat of 1864. In 1867, the first bastion in the battle to preserve the mother tongue fell, when it was decided that an abstract in one of the major European languages was to be included with all articles in the *Writings* and the *Annual Report*. In practice, the choice fell on French; German was no longer an option after 1864, and English was unknown to virtually all of the Academy's members and its entire Danish audience. However, the articles themselves were still to be written in Danish.



6284

K. D. V. S. Prot. Nr. 6284 / 1849.

Den 30te Marts 1849 Kl. 6½ forsamles Videnskabernes Selskab paa sædvanligt Sted.

Herr Conferentsraad **Engelstoft** læser Fortsættelsen af sin Afhandling betræffende nogle chronologiske og andre Spörgsmaal med Hensyn til Christian den Förstes Tronbestigelse i Danmark.

Efter Aftale i sidste Möde henledes atter Opmærksomheden paa, at Tiden til Sammenkomsten er fra Kl. 6½ til 7, og at man har vedtaget at begynde Forretningerne Kl. 7.

Mnt. Ørsted Hjelm Sec. 6

FIGURE 19. The oldest summons to a meeting of the Academy. How the members were summoned to meetings for the first many years of the Academy's existence is not known, but it was presumably by messenger – Copenhagen was small and the members were few. As secretary of the Academy, in 1820 H.C. Ørsted proposed that printed notices should be used to summon members to meetings, but a generation would pass before this would be introduced. Today, members are informed of upcoming meetings almost exclusively by electronic means. The Academy's archive.

Internally, this was a decisive initiative, but when viewed from outside, the Academy must have seemed more or less unaffected by the new social order. It continued its meetings unchallenged; the *Annual Report* was published regularly each year; the natural sciences and mathematics series of the *Writings* published weighty volumes on a regular basis; the various commissions continued their work; considerable sums were still granted in research support after careful consideration of the increasing numbers of applications received; and the dictionary project continued on its crooked course. But no new large projects were initiated, and the days in which the Academy had been the state's obvious choice as advisor in a myriad of matters of greater or lesser scientific and scholarly interest were definitively over.

The Carlsberg Foundation

The Academy was fundamentally altered by the establishment of the Carlsberg Foundation in 1876, and not least by brewer Jens Christian Jacobsen's testamentary transfer of the brewery to the Academy, which came into effect in 1888 after the death of the brewer. This gave the Academy financial security, in addition to a permanent - and luxurious - physical address with the construction of the shared domicile of the Academy and the Carlsberg Foundation in 1899. At the same time, the Academy's importance as a patron of sciences and letters in Denmark was diminishing; a role which was overtaken and - it should be emphasized - magnified by the Carlsberg Foundation. The foundation was basically the only sponsor of research projects in Denmark until 1919, when the governmental Rask-Ørsted Foundation was established in order to support the involvement of Danish researchers in international research collaboration. The National Science Foundation was not established until 1951. Today, the Carlsberg Foundation still plays a decisive role in Danish science and scholarship, not least because the foundation, unlike the majority of the other private foundations, supports basic research in every field. The inclusion of active researchers from a wide variety of subjects on the board guarantees outstanding insight into and comprehension of the many applications which land in the foundation's inbox each year.

The publications

Around the turn of the century, the Academy began to diversify its publications with the addition of works which were not included in the various series of the *Writings*. Among these was an impressive succession of some of the central sources of the history of science, for example Frederik Reinholdt Friis' edition of *Tyge Brahes meteorologiske Dagbog, holdt paa Uranienborg for Aarene 1582-1597* (Tycho Brahe's meteorological journal, kept at Uraniborg in the years 1582-1597) (1876); a facsimile edition of Tycho Brahe's *De nova stella*, also edited by Friis (1901); and an impressive collection of the very earliest maps of Scandinavia, *Anecdota Cartographica Septentrionalia*, edited by Axel Anthon Bjørnbo and Carl Sophus Petersen (1908). The academy celebrated the memories of some of the great scientists of the past in the same extremely useful manner, by publishing their works, including Ole Rømer's *Adversaria*, edited by Thyra Eibe and Kirstine Meyer on the occasion of the 200th anniversary of Rømer's death (1910), and H.C. Ørsted's *Naturvidenskabelige Skrifter* (Scientific writings) in three volumes, edited by Kirstine Meyer (1920), on the occasion of the 100th anniversary of the discovery of electromagnetism.

The humanities disciplines also benefited from the same energetic approach. The Academy published a number of important works, including Maximilian

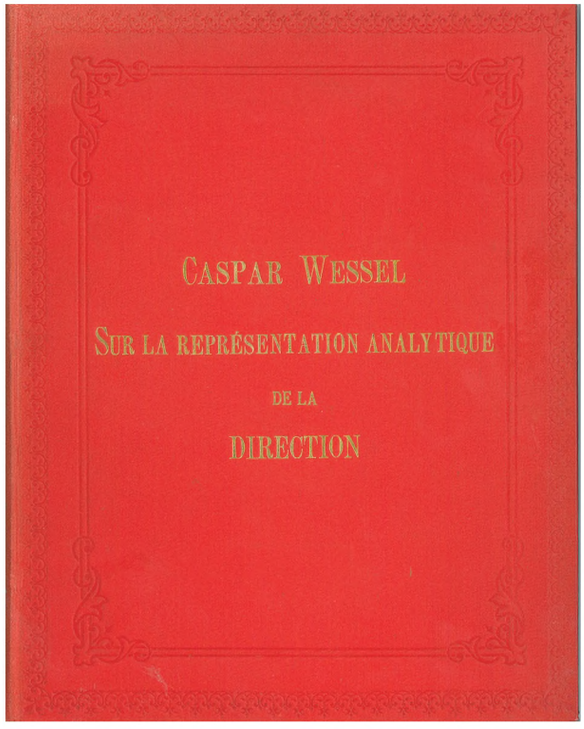


FIGURE 20. The French translation of Caspar Wessel's original treatise on the analytical representation of direction, published on the occasion of the 100th anniversary of the presentation of the treatise at the meeting of March 10th 1797 (Wessel 1897).

Curtze's edition of a medieval commentary on an arithmetic textbook by a scholar, Petrus Philomena de Dacia, who was presumably Danish. While the seemingly endless saga of the publication of the Danish dictionary did not put the Academy off publishing shorter dictionaries, such as Johan Christian Subcleff Espersen's *Bornholmsk Ordbog* (Dictionary of the Bornholm dialect) (1908), the Academy did not take on large-scale lexicographical projects. Characteristically, Otto Kalkar's five-volume *Ordbog til det ældre danske Sprog (1300-1700)* (Dictionary of Older Danish, 1300-1700) was produced under the close supervision of a commission under the Academy and funded by the Carlsberg Foundation, but was published by the newly established Universitets-Jubilæets danske Samfund (The University Jubilee Society for Danish) in the period 1881-1918.

Several of these extra publications broke with the Academy's traditional preference for Danish. At the turn of the century, Danish was only an absolute requirement for publications in the *Writings*, although it had been somewhat loosened with the introduction of abstracts in French. But the increased internationalization of the world of research made it untenable to continue to pretend that Danish is a world language. In 1902, it was decided that in addition to Danish, the *Writings* could accept treatises in Norwegian, Swedish, English, French, German - and Latin, which is still occasionally used in classical-philological publications.

The increasing specialization of the disciplines also had an impact on the Academy's publication activities. In 1917, the publication of the *Writings* was supplemented by three series of *Communications:* mathematics-physics, biology, and historical-philological, and after two years two additional series were added, philosophy and art history. As a consequence, the *Annual Report* was reduced to an annual report in contents as well as in name. The publication of the *Writings* continued, in 1941 supplemented by a biology series; the distribution of papers between the *Writings* and the *Communications* was determined by a difference in format: the relatively large quarto format of the *Writings* permits good reproductions of images, while the smaller octavo format is suitable for books with no or few illustrations.

It is worth noting that these publications continued to accept contributions from non-members, which meant that at least periodically, they continued to serve as an important channel for Danish science and scholarship in general. And an effective channel: after the problematic conditions under the First World War had ended, the number of exchange agreements increased, so that just under 350 foreign institutions received the Academy's publications on a regular basis - or a selection of them. The division into different series made it possible to subscribe to individual series and opt out of irrelevant publications. In the 1930s, the Academy opened up for an even larger international audience by offering free subscriptions to a variety of universities and research institutions which did not publish themselves, and which were therefore excluded from participating in an exchange agreement. This meant that the number of regular recipients of the Academy's publications in 1937 had grown to about 450 foreign institutions.

This was a colossal promotion of Danish research. At the same time, the publications that the Academy received in return and forwarded to Danish libraries and research institutions gave Danish researchers easy access to the latest scientific and scholarly advances. This was not free. The Academy's publication and exchange activities resulted in a serious budget shortfall, which the Carlsberg Foundation initially covered in 1918. A rather pointed appeal to the government resulted in a generous additional grant and a permanent doubling of government subsidies to the Academy.

The international organizations

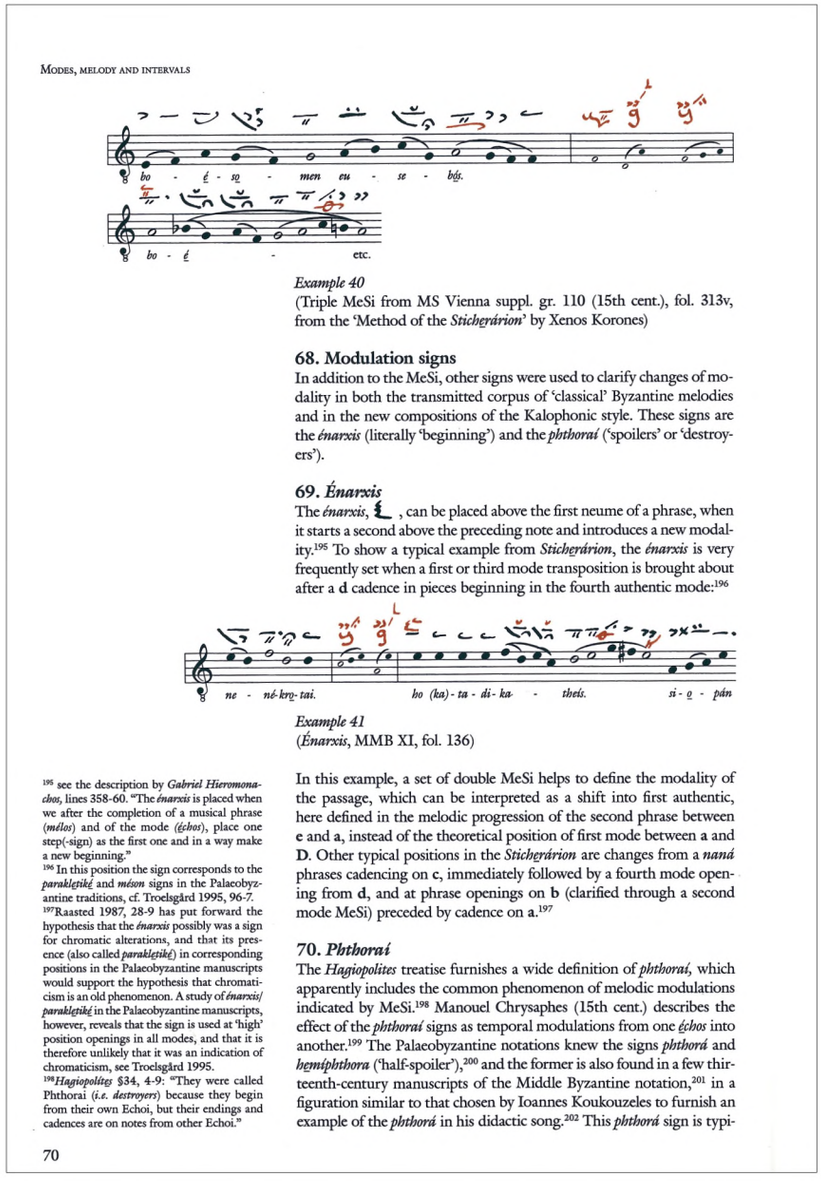
For the Academy, its exchange agreements have been its most enduring international engagement, in addition to which there have been occasional more concrete scientific and scholarly collaborations. In the year 1900, the first attempt at a more formalized collaboration between the learned academies was made, in the form of Association Internationale des Académies (AIA), which the Academy joined at its inception (see p. 47). On the initiative of the Academy and the scientific academy in Berlin, the AIA started a large joint project, the publication of the works of the medical authors of the ancient world, *Corpus Medicorum Graecorum*. Unlike the AIA, the project survived the First World War, and is still going strong, with a comprehensive website offering access to online editions, concordances, manuscript catalogues, and so on.

Denmark's neutrality under the First World War put the country in a favorable position when the horrors of war were to be succeeded by peaceful international relations. The Academy engaged itself in these efforts within its field of activity, and participated from the beginning in the union of humanistic academies, Union Académique Internationale (UAI), and after some hesitation in the natural sciences Conseil Inter-

national des Recherches Scientifiques, even though this council excluded researchers from Germany and its allied countries, to the displeasure of the Academy (see p. 46-49). As its own very concrete contribution to the resurrection of international scientific and scholarly collaboration, in the 1920s the Academy headed a commission which sent Danish scientific and scholarly literature to foreign research libraries free of charge.

The structures of the two international organizations were fundamentally different. The focus of UAI is on comprehensive, long-term concrete projects which require collaboration between member academies. This resembles the Academy's traditional approach, with committees to oversee larger projects. Perhaps this is why the Academy volunteered to participate in several of UAI's projects very quickly, including the world's largest Latin dictionary, *Thesaurus Linguae Latinae,* which is still in progress. The Academy took responsibility for two projects. The first of these is still ongoing, a comprehensive publication series of Byzantine music, *Monumenta Musicae Byzantinae*, the first volume of which was published in 1935, while the most recent was published in 2011. The second was both the Academy's darling and its problem child for many years: the scholarly dictionary of the Indian language Pāli, which is a holy language in several branches of Buddhism. Denmark has been a center for the study of Pāli, because Rasmus Rask brought back an excellent collection of Pāli manuscripts when he returned from his expedition abroad. After many problems and long hiatuses, the Academy was forced to abandon the attempt to find funding for the continuation of the project at the end of 1999. The University of Copenhagen took over the project at that point and announced the completion of the dictionary in 2011.

In 1931, the Conseil International des Recherches Scientifiques was replaced by the International Council for Science (ICSU), whose objective was and is to develop and support international cooperation organizations for the individual natural sciences subjects, based on national committees. This was a workable way of creating international collaboration, and provided that these committees could remain independent of the governments of the member countries, it was also hoped that it would ensure continued collaboration in periods of conflict. In Denmark, some disciplines, for example chemistry, included so many researchers that they organized their own national committees without the participation of the Academy, while others, for example astronomy, took advantage of the Academy's resources in order to establish a committee. In this way, the Academy played an important role in sowing the seeds of the international scientific collaboration which is absolutely indispensable to ensuring a high scientific standard in a small country.


MODES, MELODY AND INTERVALS

bo - é - ne - men eu - se - bís.

bo - é - etc.

Example 40
(Triple MeSi from MS Vienna suppl. gr. 110 (15th cent.), fol. 313v, from the 'Method of the *Stichērárion*' by Xenos Korones)

68. Modulation signs
In addition to the MeSi, other signs were used to clarify changes of modality in both the transmitted corpus of 'classical' Byzantine melodies and in the new compositions of the Kalophonic style. These signs are the *énarxis* (literally 'beginning') and the *phthoraí* ('spoilers' or 'destroyers').

69. *Énarxis*
The *énarxis*, , can be placed above the first neume of a phrase, when it starts a second above the preceding note and introduces a new modality.[195] To show a typical example from *Stichērárion*, the *énarxis* is very frequently set when a first or third mode transposition is brought about after a **d** cadence in pieces beginning in the fourth authentic mode:[196]

ne - né-krŋ- tai. ho (ka) - ta - di - ka - theis. si - ŋ - pán

Example 41
(*Énarxis*, MMB XI, fol. 136)

In this example, a set of double MeSi helps to define the modality of the passage, which can be interpreted as a shift into first authentic, here defined in the melodic progression of the second phrase between **e** and **a**, instead of the theoretical position of first mode between **a** and **D**. Other typical positions in the *Stichērárion* are changes from a *naná* phrases cadencing on **c**, immediately followed by a fourth mode opening from **d**, and at phrase openings on **b** (clarified through a second mode MeSi) preceded by cadence on **a**.[197]

70. *Phthoraí*
The *Hagiopolites* treatise furnishes a wide definition of *phthoraí,* which apparently includes the common phenomenon of melodic modulations indicated by MeSi.[198] Manouel Chrysaphes (15th cent.) describes the effect of the *phthoraí* signs as temporal modulations from one *échos* into another.[199] The Palaeobyzantine notations knew the signs *phthorá* and *hemíphthora* ('half-spoiler'),[200] and the former is also found in a few thirteenth-century manuscripts of the Middle Byzantine notation,[201] in a figuration similar to that chosen by Ioannes Koukouzeles to furnish an example of the *phthorá* in his didactic song.[202] This *phthorá* sign is typi-

[195] see the description by *Gabriel Hieromonachos,* lines 358-60. "The *énarxis* is placed when we after the completion of a musical phrase (*melos*) and of the mode (*échos*), place one step(-sign) as the first one and in a way make a new beginning."
[196] In this position the sign corresponds to the *parakletiké* and *méson* signs in the Palaeobyzantine traditions, cf. Troelsgård 1995, 96-7.
[197] Raasted 1987, 28-9 has put forward the hypothesis that the *énarxis* possibly was a sign for chromatic alterations, and that its presence (also called *parakletiké*) in corresponding positions in the Palaeobyzantine manuscripts would support the hypothesis that chromaticism is an old phenomenon. A study of *énarxis*/*parakletiké* in the Palaeobyzantine manuscripts, however, reveals that the sign is used at 'high' position openings in all modes, and that it is therefore unlikely that it was an indication of chromaticism, see Troelsgård 1995.
[198] *Hagiopolites* §34, 4-9: "They were called Phthoraí (*i.e. destroyers*) because they begin from their own Echoi, but their endings and cadences are on notes from other Echoi."

70

FIGURE 21. The series *Monumenta Musicae Byzantinae* has both contributed to making Byzantine music manuscripts accessible to research and – as in this example – to the interpretation of the old musical notation system (Troelsgård 2011, p. 70).

The Second World War

The election of Niels Bohr as president in 1939 had an immeasurable impact on the Academy's standing, both in Danish society and in the international scientific community. At that point, he was already an established celebrity, and he held forth on his research at the Academy's meetings, gladly and often. Through his establishment and leadership of the Department of Theoretical Physics at the University of Copenhagen, he had demonstrated his abilities as a visionary and

efficient organiser, so he was an obvious choice as president. Indeed, he had been encouraged to accept election as president on several previous occasions, but he had declined on the grounds that he prioritized his scientific work. However, in the face of the immediate threat of war, he considered it his duty to assume the leadership of the Academy. He remained president until his death in 1962, interrupted only by his exile in the period 1943-1945 (see p. 48s.).

In his first speech to the Academy as president at the meeting of October 20th 1939, Bohr spoke of the war which had broken out, and expressed his wish that the Academy might contribute to re-establishing international scientific and scholarly cooperation. Although no one could know with certainty how much time would pass before that wish would be fulfilled, everyone knew that the situation was extremely serious. A rare guest took part in the meeting of March 15th 1940, which was perceived as an expression of the utterly extraordinary circumstances: the Academy's protector, King Christian X. The first meeting after April 9th, the beginning of the German occupation, was held as usual, apart from rescheduling it three hours earlier than normal (at 4:15 pm) on account of the curfew. In the first years of the occupation, the Academy continued its normal activities as much as possible. Clearly, international connections had become impossible or at the very least extremely difficult, but the meetings were held. The Academy's 200th anniversary in 1942 was a quiet affair. On November 13th, the very day of the Academy's founding, an ordinary meeting was held without special guests – but with an extraordinary agenda. The editor presented the first volume of Asger Lomholt's *Det Kongelige Danske Videnskabernes Selskab 1742-1942. Samlinger til Selskabets Historie* (The Royal Danish Academy of Sciences and Letters 1742-1942. Collections illustrating the Academy's history) (see p. 10s.), after which lectures on Hans Gram, the Academy's mapping of Denmark and the history of the Carlsberg Foundation were given. Finally, the president addressed the members, and concluded with these words:

> Finally, if we return to the question of the future of our Academy, we know only this: that the fulfilment of our desires is inseparably linked with a propitious fate for our society as a whole, and that it is also inseparable from the preservation of the cooperation of all nations on the progress of science and scholarship. In this hope we trust today.

After Niels Bohr's flight to Sweden in September 1943, although the meetings continued under the direction of the chairs of the two classes, gradually cancellations became more frequent. However, the Academy did manage to celebrate the 300th anniversary of the death of Ole Rømer (September 25th 1643), in part with a special program for the meeting of October 20th 1944, in part with the publication of Mogens Pihl's *Ole Rømers videnskabelige Liv* (The scientific life of Ole Rømer) and Niels Erik Nørlund's *De gamle danske Længdeenheder* (The old Danish units of length). The Academy's irreplaceable treasures had been brought to safety after all of its documents had also been microfilmed. The last meeting of the occupation ended on the afternoon of May 4th shortly before the BBC announced the German capitulation, during the last air-raid warning, which was never called off.

The Academy since 1945

Niels Bohr returned home in the summer of 1945 and was formally reinstated as president. The legal purge of Danish collaborators which was carried out after the liberation had a relatively undramatic offshoot in the Academy. The cultural geographer Gudmund Hatt had been administratively dismissed from his professorship in 1947. At a subsequent meeting of the Academy, his behavior was perceived as provocative, and he was escorted out by three members. He began participating in the Academy's meetings again after a hiatus of ten years (see p. 192).

Research policy

Throughout its existence, the Academy has time and time again discussed the election of new members, not only on the individual level but as a matter of principle, with regard to the question of the number of members and their characteristics. This discussion took on renewed relevance after the Second World War, when the number of researchers in Denmark increased dramatically, without an even approximately proportionate increase in the number of members.

August Krogh, the other international celebrity in the Academy besides Niels Bohr, took up the issue (see p. 49s.). Krogh expressed his justifiable concern about the Academy's lack of insight into the situation of early career researchers in particular in strong terms, made even stronger by his resignation in protest. The Academy's immediate reactions were subdued to say

the least, and did little to influence the opinions of the general public. Without a doubt, the case damaged the Academy's reputation among the general public and strengthened the impression of a closed club of ancient out-of-touch academic fossils.

Internally, the question of how the Academy could and should help promote basic research through new initiatives was discussed at several meetings. In January 1951, Niels Bohr went on the radio to speak about the importance of giving much greater support to both scientific and humanistic research than hitherto; otherwise Denmark would fall hopelessly behind in relation to other countries. Bohr's appeal was elaborated in a formal communication from the Academy to the minister of education, the main argument of which was that because society as a whole benefits from not only applied, but also basic science and scholarship, the state should support basic research. This document also included concrete proposals which had a certain degree of influence on legislation, although the Academy was only represented in the newly established organs to a limited extent.

It reflects a new self-perception on the part of the Academy, which took on the role of spokesperson for science and scholarship as such and for the interests of society as a whole. This sense of responsibility to society, which has characterized the Academy ever since, also animated the Academy's founders, though naturally under very different political conditions.

In subsequent years, political control of higher education and research has not become any less tight, and to the best of its abilities, the Academy has sought to influence developments in order to ensure reasonable conditions for basic research and the influence of researchers on the conditions for the performance of science and scholarship – often with success, even though the Academy is only directly involved in the decision-making processes to a limited degree. Numerous recommendations, consultation responses, and so on have been sent, for a time prepared by successive committees, but since 1990 anchored in a permanent research policy committee.

The committee began its work with a comprehensive study of the age distribution and mobility of academic staff at Danish universities, *Forskerrekruttering I-II* (Researcher recruitment I-II), and has since been responsible for the Academy's efforts in this increasingly important field, in constant dialogue with the presidium or the president. A wide range of internal debate meetings have been held which the committee has organized and hosted. Since 2005, the most spectacular manifestation of this engagement has been the annual research policy meetings which bring together researchers, politicians, administrators from the ministries and universities, members of the boards of foundations, and other research policy stakeholders. The first speaker at the first meeting was the member of the EU commission responsible for research. Since then it has become a tradition that the minister in office is the first speaker. In preparation for the annual meetings, the committee draws up a report on a concrete set of issues which are then explored by speakers and intensely discussed by all participants; one example is the white book for the 2008 meeting, *Forskeren i samfundet: Publicering, evaluering og formidling* (The researcher in society: publication, evaluation and communication). The white books, which are published as individual pamphlets and can be downloaded from the Academy's website, are not only discussion papers, but also maps of the changing Danish research landscape. They have received well-deserved attention, and have hopefully made their mark on the shifting Danish coalition governments.

Special initiatives

The Academy has a long tradition of taking on special basic research projects, often directed by commissions established for the purpose. This tradition has continued since the end of the Second World War, for example in the form of a multi-year project on the history of agricultural tools and agrarian structures which has held international symposiums and produced publications, including the journal *Tools and tillage.*

A more unusual initiative was the effort to establish and maintain special research sites which began in 1964. The background for the initiative was concern about the increasingly intense exploitation of the land, which posed a threat to the remaining relatively untouched sites which are necessary for many types of scientific studies. One concrete result of these efforts was that the Carlsberg Foundation rented land near Stavns Fjord on the island of Samsø for 20 years, starting in 1967. The area was finally designated a legally protected area in 1982.

In the period 1974-1976, the building shared by the Academy and the Carlsberg Foundation underwent extensive renovation. A new meeting room was installed on the fourth floor in the old attic, and meeting facilities were furnished on the third floor. These meet-

FIGURE 22. Annual research policy meeting on March 16th 2017 in the Academy's old meeting room. The topic was 'the university in the blue ocean', and the speaker at the lectern is Søren Pind, minster of education and research.

ing facilities have since served as the setting for meetings of many kinds. The Academy has organized joint meetings for individual subjects and discussion meetings involving researchers, politicians, administrators, and the general public. The new facilities have also enabled the Academy to realize an old dream of hosting scientific and scholarly symposiums, including six international symposiums on the occasion of the 250th anniversary in 1992. As far as possible, the Academy itself organizes two symposiums annually, preferably interdisciplinary and with an equal distribution between scientific and humanistic or social sciences symposia. There are many more symposia which are organized by external parties. The condition for using the Academy's facilities for conferences and other meetings is that they must have a clear scientific or scholarly objective.

As a special contribution to improving the opportunities available to early career researchers in particular, in 1981, the Academy conceived the idea of establishing special scholarships to mark the occasion of the 100th anniversary of Niels Bohr's birth in 1985. The stipends included salary and funds for travel and scientific equipment, and the money to finance them was contributed by Danish companies. The Academy established a committee which assessed the 130 applications it received, and selected the 16 researchers it was possible to support with the amount which had been collected. Over the next couple of years, the committee followed the work of its stipend recipients closely and organized frequent meetings at which the young researchers presented reports on their research. In 1985, the 16 research reports were published as an anthology in two volumes, one in the mathematics-physics *Communications*, the other in the biology section of the *Writings*. To harvest the fruits of this large effort, the Academy published a report which served as the basis for a meeting with the minister of education, among others. The Niels Bohr scholarships were an indisputable success, although they were only available to researchers from the natural sciences. The Academy's humanities class discussed the possibility of copying this model, but raising private funding for this good cause was considered unrealistic.

By far the largest initiative of the past 25 years was the establishment of the Young Academy (see p. 50s.), familiarly known as DUA, which began its activities in 2011 with 16 exceptionally committed and talented junior researchers. DUA has since received well-deserved attention from the general public as well as research policy stakeholders, and the regular joint meetings with the Academy have provided the old academy with a shot in the arm.

Medals, prizes and scholarships

Over the years, a number of the founders of scholarships have entrusted the management of their funds to the Academy in order to promote scientific and scholarly aims, and today the Academy administers about a dozen foundations which support early career researchers, research stays abroad, the publication of scientific and scholarly works, academic as well as popular, lectures on chemistry (the Bjerrum-Brønsted-Lang lectures), the provision of facilities for researchers, and so on. Although funds are limited, much care is taken in the selection of the best applications, and in this way the Academy exercises a certain degree of influence on the scientific and scholarly life of the country.

The Academy has rarely entered into collaborations with private companies (aside from Carlsberg, of course). And so it was with some hesitation that the Academy accepted the task of selecting the assessment committee for L'Oréal's Women in Science awards in 2007. That the awards are conferred in close collaboration with UNESCO was an important contributing factor. The Academy has participated in the conferral of the awards ever since, in part by selecting the expert assessors, and in part by hosting the award ceremonies on the Academy's premises.

In 2011, the Carlsberg Foundation celebrated the 200th anniversary of the birth of J. C. Jacobsen with the establishment of the Carlsberg Foundation Research Prizes. Each year, two prizes carrying a cash award of DKK 1 million are conferred on a natural sciences researcher and a humanities or social sciences researcher respectively who have made decisive contributions to basic research. The prizes are awarded on the nomination of the Academy, in practice by the presidium (see p. 213).

The Academy's own awards have various aims. Each year, the Academy's silver medal is conferred on a Danish researcher under the age of 40 who has made an outstanding contribution to research within the past five years. The awards are conferred in turn on natural sciences and humanities or social sciences researchers. Since 1942 the gold medal, which was formerly awarded to prize treatises, has been a rare distinction conferred on a researcher outside the Academy in recognition of life-long scientific or scholarly contribution.

On the occasion of Her Majesty's 75th birthday in 2015, the Academy established Queen Margrethe II's Science Prize. The prize, which carries a cash award of DKK 100,000 will be awarded annually for 25 years to an outstanding researcher under the age of 50 in the subjects represented in the Academy.

FIGURE 23. Her Majesty the Queen conferring the Academy's newly established Queen Margrethe II's Science Prize for the first time on April 20th 2016. The recipient of the prize was Jens-Christian Svenning, who is admiring the award certificate together with Her Majesty and the president of the Academy, Kirsten Hastrup.

While the scholarships referred to above are all awarded by the Academy for scientific and scholarly purposes, a number of foundations have been created in order to support the Academy itself. Some are earmarked for specific purposes, for example the production of the medals the Academy confers, while others support the Academy's activities more generally. The Academy has a close connection to the foundation Den Hielmstierne-Rosencroneske Stiftelse, which donates one twelfth of its annual income to the Academy. The foundation was established in 1809 by Count Marcus Gerhard Rosencrone and his wife Countess Agnete Marie Rosencrone who was the daughter of one of Academy's founding fathers, Henrik Hielmstierne. This annual gift emphasizes in a fine way the continuity in the history of the Academy. A rather special foundation is Medlemmernes Bidragsfond (The members' contribution foundation), which was established in 1975 in response to criticism of the refreshments offered after meetings; it was claimed rather sourly that the members were wasting research funds. That accusation can now be disproved: every year, the contribution foundation receives payments from active members in particular, who in this way pay for the quite modest *smørrebrød* sandwiches which are consumed along with Carlsberg's good beer.

International collaboration

Contrary to the hopes of Niels Bohr – and many others – the end of the war did not pave the way for the free global exchange of knowledge, let alone global scientific and scholarly collaboration. Quite the reverse turned out to be the case, as the Cold War drastically limited opportunities for collaboration. The academy became directly involved in aid to Hungarian refugees after the uprising of 1956. With economic support from the Ford Foundation, a small group of students from Hungary was enrolled in degree programmes in Denmark, and the Academy took responsibility for administering these scholarships at the request of the foundation.

Despite the sharp division of Europe into East and West by the Iron Curtain, some of the international scientific and scholarly institutions were successfully reestablished. UAI's projects were continued or resumed, still with the active participation of the Academy, which also hosted some larger meetings. Since the Pāli dictionary was given up by the Academy in late 1999, the Academy itself is now responsible only for *Monumenta Musicae Byzantinae,* while still participating in several other UAI projects.

The ICSU also resumed its activities quickly after the war. With – and without – the participation of the Academy, a number of new scientific and scholarly unions and committees have been established. Gradually, the Academy has taken on the role as intermediary between the international unions and the national committees, and now formally represents Denmark in the ICSU. Administratively speaking, the Academy handles contact to the ICSU, including payment of membership dues, responsibility for which passed to the research councils after the dissolution of the Rask-Ørsted Foundation in 1972, and has rested with Universities Denmark since 2012. In addition, the Academy approves the selection of members of the individual national committees. Beyond a doubt, this engagement in ICSU has given the Academy a certain standing in the Danish research community.

In November 1945, the United Nations established UNESCO, its organization for education, science, and culture. In principle, UNESCO is an international collaboration at government level, and so academies of sciences and letters are not as such involved in the organization. However, in practice the Academy became involved in the selection of the members of the Danish UNESCO committee, and in this way was ensured a measure of influence on its work. Even more importantly, the mathematician Jakob Niels Nielsen, who was secretary of the Academy, was a member of UNESCO's executive management in the period 1952-1958. In addition, he participated in the negotiations which led to the founding of the European center for particle physics research, CERN (Conseil Européen pour la Recherche Nucléaire). He was extremely well-respected internationally, and it most certainly reflected positively on the Academy that both its president and its secretary were such prominent researchers at a global level.

In 1974, the European Science Foundation (ESF) was established as a cooperative organization for scientific and scholarly foundations, research institutions, and academies in Europe. The Academy joined the ESF early on, an organization whose goals are in perfect harmony with the Academy's own: to advance free, researcher-driven research, with a special focus on basic research in the natural sciences, the humanities, and the social sciences. The Academy nominates Danish researchers to participate in the ESF's activities. Since then, larger and smaller international asso-

ciations of academies of sciences and letters have emerged, and the Academy has steadfastly participated in their work, while regularly discussing their relevance and impact. In addition, bilateral cooperation agreements with other academies and research institutions have been concluded; as a rule, these partnerships have functioned for a number of years before fading out. It certainly appears as if this type of institution has become less relevant now that the internet provides such easy access to colleagues and research environments.

Persecution of researchers is not uncommon, globally speaking, and the Academy has in numerous cases joined international protest actions, for example in support of Andrej Sakharov in 1980 and 1986. Unfortunately, this kind of concrete action is still necessary, and is now handled to a large extent by the International Human Rights Network of Academies and Scholarly Societies, with which the Academy is affiliated through the national committee for human rights of the Danish academies of science and letters.

The publications

During the German occupation, the Academy succeeded in continuing to publish the *Annual Report* and the various series of the *Writings,* although the latter was published increasingly infrequently. After the liberation, this activity too was normalized, which put a strain on the Academy's finances. In order to simplify the Academy's publications, in 1956 it was decided to reduce the number of series, an effort which has continued since, with the result that there have been four series since 1971: biology, mathematics-physics, and two humanities series, which are only distinguished by their different formats (the large quarto and the small octavo respectively) and the associated possibilities for including reproductions of images. To begin with, the distinguished, but also difficult and (for foreigners) utterly opaque Danish titles were retained, but in 2010 they too were overtaken by internationalization. Latin series titles were introduced under the common heading *Scientia Danica* and the designations for the series *B, Biologica*; *H, Humanistica, 4* (both in the large quarto format); *H, Humanistica, 8* and *M, Mathematica et physica* (in the small octavo format). The *Annual Report* (Oversigten) has retained its original Danish name, but with the English title included as a subheading.

Since its founding, it has been taken for granted that the Academy's members could – and in some periods had to – publish in its *Writings*. With the increased competition in the world of science and scholarship, this tradition began to appear quite provocative, and the Academy was openly criticized for this practice. The work submitted by non-members has always been evaluated by qualified members before acceptance, and in 2007, a mild form of assessment of members' manuscripts was also introduced: members were to be informed of the title and author(s) at a plenary meeting, after which the manuscript was made available for review at the secretariat. In 2009, proper anonymous peer review of all manuscripts by at least two specialists, either members or non-members, was finally introduced. This arrangement ensured that the Academy's publication series could be included in the official bibliometric research indicator lists of acceptable and accredited publication channels.

Special publications which are not part of a series are still an important aspect of the Academy's publishing activities. These include a group of publications of relevance to the history of science, including an English translation of Tycho Brahe's *Astronomiae Instauratae Mechanica* from 1598, published in 1946 on the occasion of the 400th anniversary of his birth, the beautiful result of an interdisciplinary collaboration between the philologist Hans Ræder and the astronomers Eli and


SKRIFTPRØVE

over Skrifter til

Det Kgl. Danske Videnskabernes Selskabs Publikationer

1 Petit Fransk Antikva (bruges til Noter og Henvisninger til Bibliotekets Brug)
2 Nonpareille Fransk Antikva (bruges til Noter under Tabeller og i enkelte Tilfælde til Bibliotekshenvisninger)
3 Kolonel Fransk Antikva (almindelig anvendt til Noter og Bibliotekshenvisninger m. m.)
4 Petit Fransk Antikva (almindelig anvendt til »Mindre Skrift«, Tabeller og Opstillinger)
5 Bourgeois Fransk Antikva (Grundskrift i alle Publikationsrækker)
6 Korpus Fransk Antikva (anvendes ikke)
7 Cicero Fransk Antikva (anvendes kun sjældent)
8 Mittel Fransk Antikva (kun som Overskrift i enkelte Tilfælde)
9 PERLE FRANSK VERSALIER (anvendes ikke)
10 NONPARIELLE FRANSK VERSALIER (undertiden til Titler)
11 KOLONEL FRANSK VERSALIER (undertiden til Titler)
12 PETIT FRANSK VERSALIER (undertiden til Titler)
13 BOURGEOIS FRANSK VERSALIER (anvendes kun sjældent)
14 KORPUS FRANSK VERSALIER (som Overskrift over Afsnit, som Indledning, Indhold o. l.)
15 CICERO FRANSK VERSALIER (Forfatternavn paa Titler)
16 MITTEL FRANSK VERSALIER (Titelskrift)
17 TERTIA FRANSK VERSALIER (Titelskrift)
18 TEKST FRANSK VERSALIER (Titelskrift)
19 2-CICERO FRANSK VERSALIER (Titelskrift)
20 DOBBELTMITTEL FRANSK VERSALIER (Titelskrift)
21 3-CICERO FRANSK VERSALIER (Titelskrift)
22 TERTIA SMAL FRANSK VERSALIER (Titelskrift)
23 TEKST SMAL FRANSK VERSALIER (Titelskrift)
24 2-CICERO SMAL FRANSK VERSALIER (Titelskrift)
25 DOBBELTMITTEL SMAL FRANSK VERSALIER (Titelskrift)
26 3-CICERO SMAL FRANSK VERSALIER (Titelskrift)
27 Petit Fransk Kursiv
28 Nonpareille Fransk Kursiv
29 Kolonel Fransk Kursiv
30 Petit Fransk Kursiv
31 Bourgeois Fransk Kursiv
Almindeligvis til Fremhævelse af Artsnavne, Eksempler o. lign. i samtlige Publikationer
Forskellige Overskrift-Typer
32 NONPARIELLE FRANSK KAPITÆLER
33 KOLONEL FRANSK KAPITÆLER
34 PETIT FRANSK KAPITÆLER
35 BOURGEOIS FRANSK KAPITÆLER
Almindeligvis til Forfatternavne, naar der ikke er for mange
36 Petit Latina
37 Korpus Latina
38 Petit Aldine
39 Korpus Aldine
40 Cicero Aldine
41 Petit bred Etienne
42 Korpus bred Etienne
43 Cicero bred Etienne
44 53-5-11 (Korpus halvfed Antikva)
45 Korpus fed Antikva Kursiv
46 Cicero fed Antikva Kursiv
47 Petit Romersk
48 Bourgeois Romersk
49 Korpus Romersk
50 Cicero Romersk
51 Mittel Romersk
52 Tertia Romersk
53 Tekst Romersk
Til Overskrifter, men ikke mere til Titler
54 Ἑλλήνια (Petit Græsk) 192-1-9
55 Ἑλλήνια (Korpus Græsk) 192-1-11
56 Ἑλλήνια (Cicero Græsk) 192-1-12
Almindeligvis til alt Græsk

FIGURE 24. Plate showing samples of the Academy's many different fonts designed by Bianco Lunos Bogtrykkeri before 1977, when the Academy had to give up the fount Fransk Antikva, which was not available for phototypesetting. At that point the Academy switched to Baskerville (Dal 1987, p. 67).

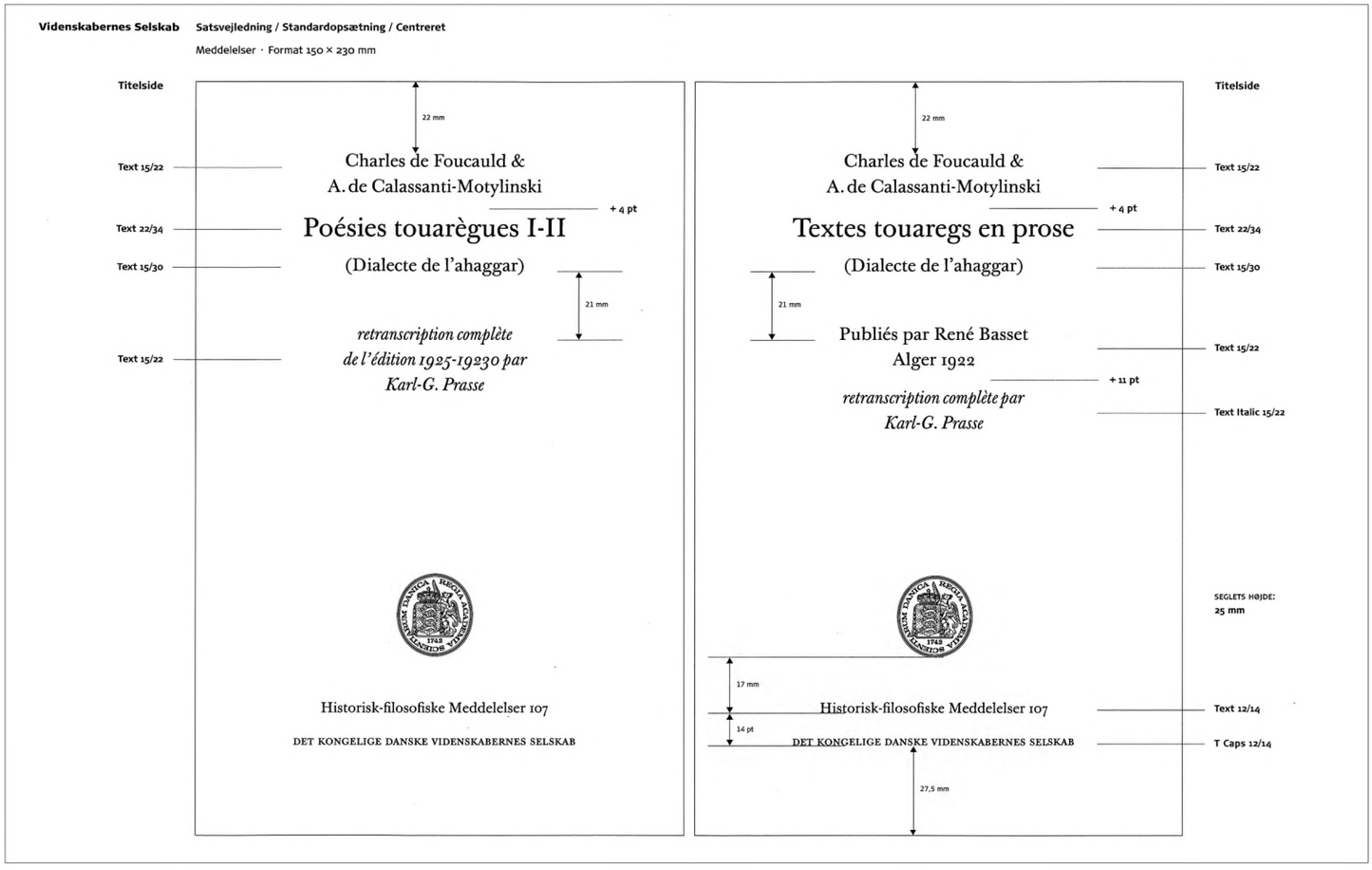


FIGURE 25. Page in Mette and Eric Mourier's typesetting manual for the Academy's publication series. The manual was produced in 2009-2010, and has since then been brought up to date. The examples have been taken from books in production at the time and, as can be seen here, are incredibly precise and detailed.

Bengt Strömgren - and an example of a persistent effort to bring the titans of Danish science and scholarship to the attention of an international audience. One such large and demanding project was the publication of an important source in the history of language: Tönnies Fenne's Low German manual of Russian, written in 1607 as an aid for German merchants who wanted to do business with Russian customers. Very practically, the book is organized as a combined dictionary and phrase book. This interesting and amusing work was only extant in the original manuscript, and its publication turned out to be a complicated affair: four volumes which were published at irregular intervals from 1961 to 1986.

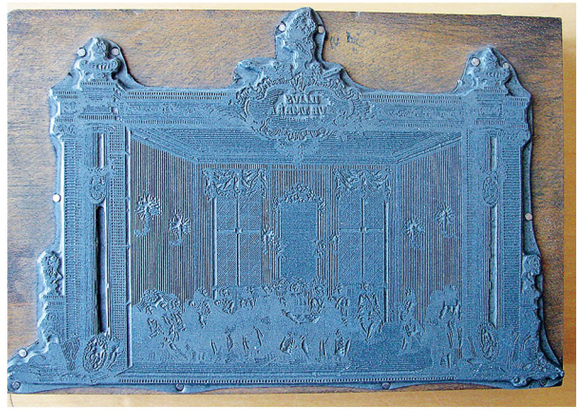
There is a long tradition of publications commemorating significant occasions in the life of the royal family which is still honored today. Queen Margrethe II has been celebrated with a series of publications: a facsimile edition of Ludvig Holberg's two small contributions to the *Writings* (1972), as well as the anthologies *Videnskabens Enhed -?* (The unity of science -?) (1990), *Sprog og tanke* (Language and thought) (1995), *Fra Egtvedpigen til Folketinget* (From the Egtved Girl to Parliament) (1997), *Som kongerne bød* (As the kings commanded) (2000), *Det fremmede som historisk drivkraft* (The foreign as a motor of history) (2010) and *Grønlands fascinationskraft* (The fascinating power of Greenland) (2012). Although the occasions for the publication were royal, the books are aimed at a general audience. They received excellent reviews and sold well.

Over the years, the Academy has worked with many different printers, often for long periods. Bianco Luno's printing house holds the record: for about 150 years starting in 1837, this printer published the series and the majority of the annual reports and the special publications. This unusually stable working relationship was celebrated by two publications. In 1962, as a gift to the Academy commemorating 125 years of collaboration, Bianco Luno printed Asger Lomholt's *Lærdomsmosaik* (Mosaic of learning), which distils the essence of his great work *Samlinger til Selskabets Historie* (Collections illustrating the Academy's history). Twenty-five years later, the Academy and the printing house co-published a portfolio, *150 års samarbejde. Det Kongelige Danske Videnskabernes Selskab og Bianco Lunos Bogtrykkeri A/S* (150 years of collaboration. The Royal Danish Academy of Sciences and Letters and Bianco Lunos Bogtrykkeri A/S). This exceptionally luxurious portfolio, of which 160 copies were printed, contains

FIGURE 26. Four methods of printing images which have been used in the Academy's publications:

A. Copperplate for Hinrich Rink's map of Western Greenland from 1852.
B. Lithographic stone with an image of a large ten-armed squid, *Ommatostrephes pteropus* Steenstrup, 1855. The stone was prepared in connection with Japtetus Steenstrup's posthumous treatise 'Spolia atlantica. Kolossale Blæksprutter fra det nordlige Atlanterhav' (Giant cephalopods of the North Atlantic), 5th series, volume 4, pp. 409-456 (1898), but was never used, probably because an illustration of a different species of cephalopod was required for the treatise.

C. Hand-carved wooden blocks for printing Ole Rømer's *Adversaria* from 1910 with the later editor's, Poul Lindegård Hjorth's, handwritten identification of the contents of the small box.
D. Cliche-zinc plate of the oldest representation of a meeting of the Academy, printed from the original, which is reproduced on page 35. The cliche-zinc plate was probably produced for Lomholt 1962, where the image is included on p. 69. Dal 1987 includes a discussion of the Academy's publications from the perspective of book history.



a review of the history of the Academy's publications and 33 original samples of typography and reproduction; in addition, 18 copies of an even more comprehensive portfolio were published for use by researchers. After Bianco Luno, the printing house Specialtrykkeriet Viborg (renamed Specialtrykkeriet Arco in the spring of 2017) took over the role as the Academy's primary printer, and for the past ten years, the Academy has had the privilege of having its publications prepared by a single employee, the graphic designer Poul Erik Damgaard.

In 2009-2010, the well-known book designers Mette and Eric Mourier developed a detailed design manual for the publication series which provides uniform typography without imposing unduly strict guidelines on authors. Style sheets for Danish and English publications which are available on the Academy's website are intended to help rationalize the typographical process, but have so far only been followed consistently by one author.

The *Annual Report* has – and has always had – its own identity, which was thoroughly revised and improved in 2013. Typography and layout were modernized, and some of the extremely detailed reports which are only of interest to a very limited audience were weeded out. Today, the *Annual Report* is an accessible and engaging presentation of the Academy's activities in the preceding season.

One of the sections which has been preserved in the modernized *Annual Report* is the obituary section on deceased members. Since 1914, commemorative speeches honoring all deceased members have been held at meetings; previously, only particularly prominent members were honored in this way. These obituaries in their diverse totality are a unique source for the history of science, which is the most important justification for publishing them.

The workmanship of the Academy's publications has always been excellent, with high-quality paper, typography and illustrations. Over the years, the most

advanced technologies available have been used in reproducing illustrations, often with extremely beautiful results, even where the primary intention is informative. The Academy's archive contains a large collection of copperplates for engravings, some zinc printing blocks, a few wooden blocks for wood engravings and woodcuts – but only one etched lithographic limestone plate. This is bound up wih the fact that the expensive lithographic stones could be cleaned and reused.

Over the course of many years, the Academy collaborated with various publishing houses which acted as commission agents, interrupted by periods in which the Academy ran its own printing house. The practice of handling this last phase of publication was resumed in 2005 and has continued since then. In the secretariat, Mette Danielsen is responsible for the Academy's publishing activities.

The exchange agreements expanded considerably after the end of the Second World War, and the government's financial contribution to the Academy was justified in terms of these agreements. In 1944, the Academy's publications were sent to 452 foreign institutions, and by the turn of the century, the number had more than doubled. But a few years later, this arrangement ran into very serious problems when the Royal Library, which had handled the distribution of the foreign publications, cancelled it; the library intended to focus on digital resources and, it must be concluded, was no longer willing to waste space on books. The participating institutions were asked to confirm their continued interest in receiving the Academy's publication series; if not, they would no longer be sent. In this way, the exchange agreements were somewhat weeded out, but they are still a financial burden which continues to increase.

This is one of the reasons why online publication appears desirable. As far back as 2001, the presidium discussed the possibility for the first time, both with regard to regular digital publication and a retrodigitization of the older publications. In 2004, it was decided to digitize the mathematics-physics publication series; after a generous offer from the University of Southern Denmark, the works were published on the university's website in 2007. Two years later, it was decided to digitize all of the Academy's publications from 1745 to the present. At that point, work was already in progress on the development of a comprehensive database containing detailed information about each publication. The digitization process itself is well under way, but there are problems with the text recognition which is a precondition for digital searches. The Academy will continue to publish printed books for the time being, as experience indicates that online editions supplement printed works rather than outcompeting them. The new books will be made freely available online after one year's quarantine.

The archive

In the first many years of the Academy's history, the secretary was responsible for handling minutes, records, letters, and other papers. They were originally stored at the homes of the successive secretaries. During the British attack on Copenhagen in 1807, the home of the Academy's secretary at the time, Thomas Bugge, was hit by 40 bombs; some of the Academy's documents were burnt along with the house. When H.C. Ørsted became secretary in 1815, he reorganized the Academy on many levels, and a dedicated archivist position was created. The archival material was stored close to the meeting rooms, and when the Academy moved into the building it now shares with the Carlsberg Foundation, plenty of room was set aside for the archive, with easy access to the documents.

Although the collection of older sources is rarely supplemented, this has taken place at least twice in

FIGURE 27. Despite the Academy's changes of address over the centuries, a complete series of minute books has been preserved, the most important source of the Academy's history. The Academy's archive.

modern times. Katrine Hassenkam Zoref, who is on the secretariat's staff and is currently responsible for the archive, recounts the story of the first of these:

Hans Gram's plan for the establishment of a learned academy in Copenhagen, the so-called *Collegium Antiquitatum*, is considered the Academy's founding document, and is registered as document no. 1 in the Academy's minutes of its first meeting (see p. 19 with photo). When he was in the process of tidying up and cataloguing the Academy's archive in the 1930s, the archivist Asger Lomholt noticed that this important document was no longer included in the Academy's archives. The document was traced to the library of the Royal Norwegian Academy of Sciences and Letters in Trondheim, and in 1935 it was deposited at the Royal Library in Copenhagen, where Lomholt established its authenticity. The Danish academy attempted to get the manuscript back, but its efforts were in vain. When the Norwegian academy celebrated its 200th anniversary in 1960, the Danish academy again requested its return, justifying the request in an account of how the document most likely had ended up in Trondheim: two of the Academy's members were among the founders of the Norwegian academy, and had probably been given permission to borrow Gram's plan by way of inspiration. This account, along with the plan's incontestable provenance, moved the management of the museum of the Royal Norwegian Academy of Sciences and Letters, to which the library belonged, to return the document to the Academy, where it was added to the archive as appendix no. 1.

The gift-giving went the opposite way in 1975. When Iceland celebrated the 1100th anniversary of its first settlement in 1974, the Academy's gift was a special edition of Eggert Ólafsson and Bjarni Pálsson's description of Iceland, which the Academy had published in 1772 (see p. 30-32). The Academy still owned the original drawings for the 51 copperplate engravings in the work, and in February 1975, it was decided to donate them to the national museum of Iceland.

It is not possible to refer to the Academy's archive without mentioning Asger Lomholt. He was employed in the secretariat for 50 years, from 1925 to 1975, with various titles - including archivist, for many years. No one has had a greater influence on the organization of the archive, and he drew on his vast knowledge of the materials in his five-volume work *Samlinger til Selskabets Historie* (Collections illustrating the Academy's history) (1942-1973), which has constituted the unavoidable foundation for all subsequent treatments of the topic - and for treatises on the history of science of all kinds (see p. 105.). The Academy honored him with its gold medal in 1961, and after his death in 1990, the Academy's president, Erik Dal, delivered his eulogy. The archive was the apple of Lomholt's eye, and he guarded its treasures, even though he was extremely helpful when someone needed them. Dal also remembers how the work days in preparation for the 1942 anniversary, which involved the publication of the first volume of the Collections, grew so long that Lomholt could not get home before the curfew, and had to spend the night at the secretariat: "After all, the archivist could not move the archive to his house in the suburbs". His loyalty to - indeed, his love for - the Academy was unsurpassed: "No one could write 'the Academy' so often and with such a large 'A' as Lomholt".

Popular research communication

Since its founding, one of the Academy's important tasks has been communicating new research results to the general public. For the first many years, this took the form of the publication of the *Writings*, which was later supplemented by *Dansk Historisk Almanak* (Danish historical almanac) for a time. As time passed, the Academy's publications became so specialized that they were often exclusively addressed to researchers. With increasing public funding for research, justifying the expense to taxpayers became urgent, and popular research communication became - again - an important task for the Academy.

The furnishing of a new meeting room in connec-

FIGURE 28. The series *Grundvidenskaben i dag* (Basic research today), which was published in 30 pamphlets from 1977 to 1981, is one of the Academy's many popular research communication initiatives.

FIGURE 29. Public lecture in the new meeting room.

tion with the renovation in 1974-1976 made an unprecedented form of research communication possible: public lectures. The Academy established a committee for outwardly-directed activities in Denmark, in 2011 renamed the research communication committee, whose primary task is to organize a lecture series with originally five, now six lectures each semester. The lecture series is aimed at promoting public understanding of basic research, or – more narrowly – at raising the Academy's profile. The lectures cover a wide variety of subjects, primarily related to all forms of basic research, and over the course of the past forty years, there has been a relatively even distribution between the natural sciences and the humanities or the social sciences, with a slight over-representation of the former. Naturally, many of the lectures have been held by the members themselves, although there are a few more non-members among the speakers. In recent years, numerous members of the Young Academy have spoken about their research. The lectures are generally held as part of a series, either focused on a concrete theme such as light or in the general series, *Aktuelt fra forskningen* (Current research results). In addition, since 2015 special evenings have been arranged each year at which the speakers are recipients of the year's Elite Research Prize and L'Oréal-UNESCO For Women in Science.

The theme of the first lecture series, which began in 1976, was 'Basic research today'. The lectures were subsequently published as short pamphlets, handsome but inexpensive. After 30 pamphlets in the series had been published, the practice was discontinued, primarily for financial reasons. Later five public lectures on Niels Bohr and modern atomic physics were published as a single volume.

The public lectures have been one of the Academy's great successes from the very beginning. Admission is free; however, an admission card is necessary – in our day often in the form of an email or a text message on a mobile phone. Naturally, the audience varies depending on the topic, but there is a faithful group of returning guests. Although the size of the audience also varies considerably, a full house is not uncommon, and the average number of guests is about 110. The lectures are announced in fliers which are distributed to libraries and educational institutions, in addition to the Academy's website and Facebook profile. From the secretariat, Eva Bang-Hansen handles the large job of organizing and managing the lectures.

For a short period, from 1977 to 1984, the public lectures were supplemented by a series of J.C. Jacobsen Memorial Lectures by foreign members. The lectures

were intended to be popular, but it was difficult to attract the public, most likely on account of difficulties in understanding foreign languages (German, English and Swedish), and as the series was very expensive, it was discontinued after a short time.

However, the time was ripe for this type of lecture after the turn of the century. Since 2011, the Academy has held two annual lectures by Nobel Prize winners. They are held as part of the Royal Academy Nobel Laureate Lectures, which is wholly funded by the Novo Nordisk Foundation. The audience greatly exceeds the capacity of the Academy's own facilities – 500-700 guests at each lecture. The lectures are intended to reach a wide audience, and the Nobel Prize winners are asked to speak about their scientific work in the most accessible terms possible; often with a stress on the path to the Nobel Prize and life afterwards. The purpose of these lectures is to communicate knowledge at the highest level, while at the same time getting students, academics, and the general public inspired and excited about science.

FIGURE 30. Young people talking with Nobel Prize winner Paul Nurse after his Royal Academy Nobel Laureate lecture on May 22nd at the Black Diamond (the waterfront extension of the Royal Library).

Although humanists and social scientists do not really have an equivalent to the Nobel Prize (except for economists), the Carlsberg Foundation places as much emphasis on these branches of knowledge as on the more exact sciences. One expression of this commitment is the lecture series Royal Academy Lectures in the Humanities and Social Sciences, founded in 2013, whose annual lecture has achieved great success

FIGURE 31. The Queen's Hall in the Black Diamond during Heinrich Detering's lecture 'Frygt og bæven: Religion og fortællekunst i Thomas Manns *Josef og hans brødre*' (Fear and trembling: on religion and narrative in Thomas Mann's Joseph and His Brothers) on March 8th 2017, part of the series Royal Academy Lectures in the Humanities and Social Sciences.

FIGURE 32. Mogens Høgh Jensen, president of the Academy, during a tour of the Academy, next to Hans Gram and a poster of the newly elected members of the Young Academy. The Festival of Research, April 27th 2017.

among a diverse group of students, researchers, other academics, and the general public. There are several hundred guests at each lecture, so it is necessary to rent a suitable venue elsewhere than the Academy's own premises.

As a supplement to the varied series of lectures, the Academy has made an effort to offer other kinds of research communication.

The Festival of Research, which offers a wide variety of activities and events, has also included tours of the Academy's premises since 2008, including – naturally – lectures, which are quite short (while still of a high standard), and often with other activities, such as tastings and book sales with special offers. Since 2013, these lectures have been held in cooperation with the Young Academy, so that each topic is explored both by a member of the Academy and a member of DUA.

All of the Academy's popular research talks are recorded and made available on YouTube via the Academy's website and Facebook. These videos have many viewers, and a number of lecturers link to these films from their own websites.

The Academy held book sales combined with tours in 1994, 1999, and 2006. The first of these was a true local sensation with long queues down H.C. Andersens Boulevard, while the last was a more modest success, although many guests were seen lugging away heavy shopping bags full of pure knowledge.

EuroScience Open Forum (ESOF) is a large and very diverse event about science with a broad audience, including researchers, administrators, and the general public. It has been held every other year since 2004 in different European university cities, and Copenhagen won the competition to host ESOF in 2014. The Academy participated at several levels. The most popular event was without a doubt the open-air performance of Michael Frayn's play *Copenhagen* in the garden behind the Carlsberg Academy (formerly Niels Bohr's residence) – the perfect setting for the piece. The Academy also tried out the Science Walk concept, walking tours of the city with a focus on the traces left by major figures in science, which was such a success that such walks have been offered several times since then, for example in connection with the festival Golden Days, which also offers tours of the Academy's premises.

Concluding remarks

The subject of this chapter, the Academy and the surrounding society, presupposes the marginalization of important conditions and events of a more internal nature. To rectify this imbalance slightly, it should be mentioned here at the conclusion of the chapter that the meetings of its members have been the undisputed focus of everything that has taken place, throughout all of the Academy's 275 years. This is where the mem-

bers discuss all manner of business, and most importantly, this is where the Academy's defining activity takes place: the communications through which members present their current research. As a member, these communications confront one with subjects of which one understands only a fraction, and superficially at that. Nonetheless, they are deeply inspiring. The members' engagement is equally intense no matter what subject is being communicated. In fact, it might be said that what binds the members together through the ages is their passion for research.

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