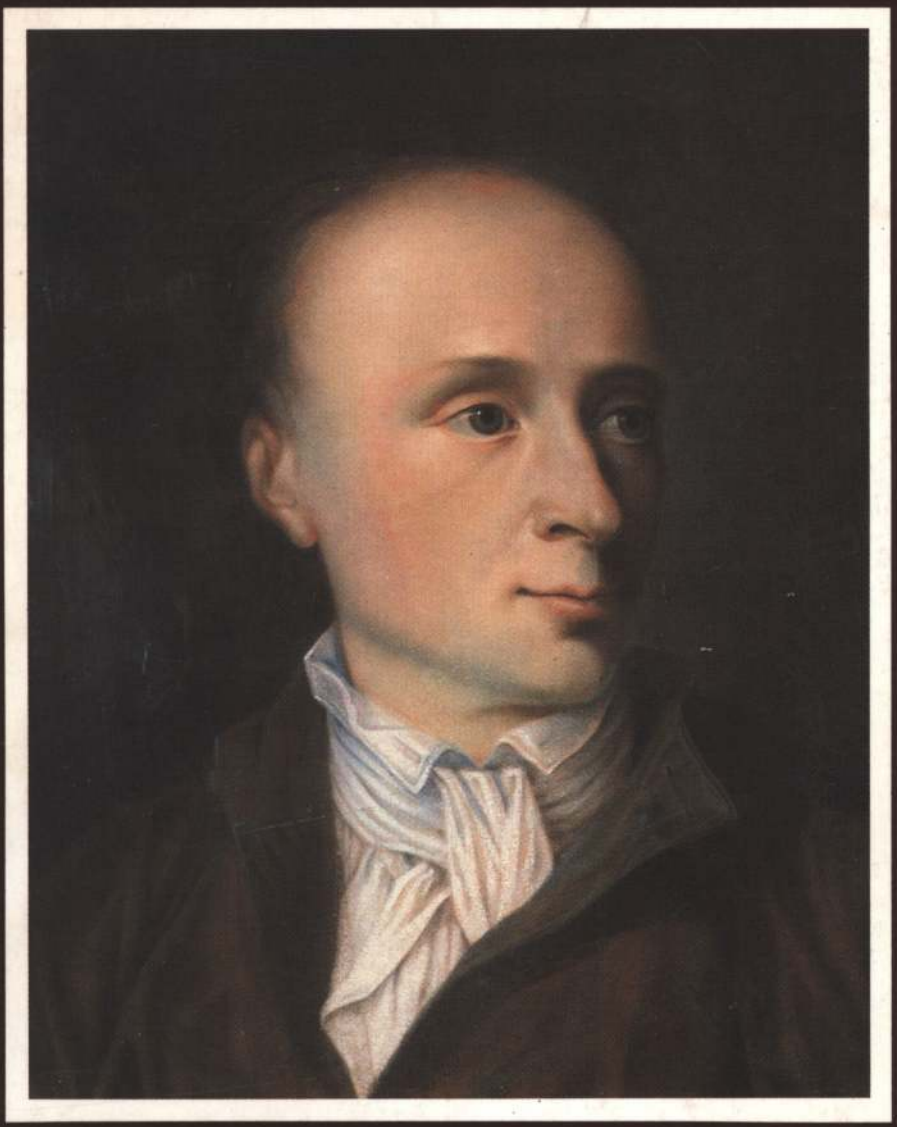
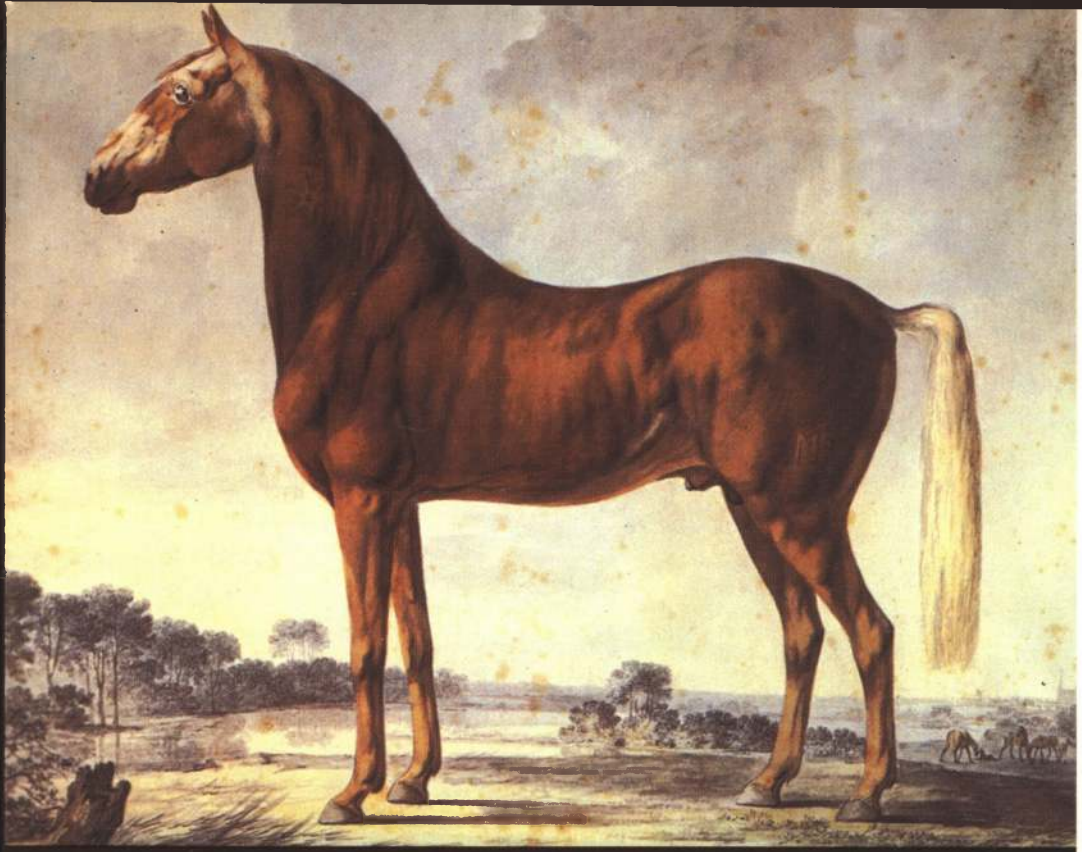


P. C. ABILDGAARD

BIOGRAPHY · BIBLIOGRAPHY



Front cover:
Peter Christian Abildgaard. Pastel drawing by veterinarian *Gustav Michelsen* in 1824 after a portrait (now lost) by *Jens Juel.* Mrs. *Anne C. A. Viborg* presented the copy to the Veterinary School saying that it was an extremely good likeness. It now hangs in the Danish Veterinary and Agricultural Library, Copenhagen.

Inside front cover:
Bæveren (b. 1821), stallion at the Frederiksborg stud. Colour-wash drawing by *C. D. Gebauer.*

Back cover:
P. C. Abildgaard, portrait by *C. F. v. Breda,* 1800 (oil painting). Museum of National History, Frederiksborg. Copy at the Royal Veterinary and Agricultural University, Copenhagen.

Inside back cover:
The giant *Ymer* (*Augelmir*) suckling from *Audhumla. Nicolai Abraham Abildgaard* (1743-1809). The Royal Museum of Art, Copenhagen.

P. C. ABILDGAARD

(1740–1801)

Biography & Bibliography

For The Faculty of Veterinary Science

The Royal Danish Veterinary and Agricultural University

Edited by

Sigurd Andersen

in collaboration with

Niels Haarløv, Ivan Katić and *Peter Nansen*

Kandrup

Copenhagen 1985

1914–1983

N. O. Christensen

Upon the bicentenary for the foundation of the Royal Veterinary School in Copenhagen, the Faculty of Veterinary Science at the Royal Veterinary and Agricultural University decided to institute a gold medal, the Abildgaard Medal. The means for this were to be derived from the Peter Christian Abildgaard Foundation which serves, besides, a number of other veterinary scientific purposes.

The initiative to institute the medal as well as to establish the foundation came from the late professor in clinical veterinary science, Niels Otto Christensen, Dr. med. vet. honoris causa (Hanover), Ridder af Dannebrog, p. p., who also on October 2nd of the same year in his capacity as Dean of the Veterinary Faculty signed the Charter of the Foundation.

It was not an accident of circumstance that it became N. O. Christensen who took the initiative to establish the Peter Christian Abildgaard Foundation and made it feasible periodically to confer the Abildgaard Medal. By his great veneration and affection for the Royal Veterinary and Agricultural University and also his manifold artistic and comprehensive scientific interests, he became one of the Danish veterinary teachers who had most affinity with P. C. Abildgaard, and these qualities made him known and appreciated at home as well as abroad.

Therefore this book is dedicated to the memory of N. O. Christensen.

Design of the Peter Christian Abildgaard Medal by *Frode Bahnsen*, 1974. (Museum of Veterinary Medicine, Copenhagen).

CONTENTS

HERE LIES
PETER CHRISTIAN ABILDGAARD
PROFESSOR
FOUNDER AND PRINCIPAL OF THE VETERINARY SCHOOL
SECRETARY OF THE SOCIETY OF SCIENCES AND LETTERS
BORN IN COPENHAGEN 22nd DEC. 1740
WHERE HIS GENTLE EYES WERE CLOSED BY DEATH
21st JAN. 1801
AS A SCIENTIST
KNOWN AND HONOURED ALL OVER EUROPE
FOR HIS ERUDITION AND EXTENSIVE KNOWLEDGE
AS AN OFFICE-BEARER
RESPECTED FOR UNTIRING
AND BENEFICIAL ENDEAVOURS
AS A CITIZEN AND HUMAN BEING
LOVED FOR AMIABLE PIETY
UNFAILING LOYALTY
AND NOBLE DEMEANOUR
THEREFORE TEARS OF FRIENDSHIP MOISTEN HIS ASHES
THEREFORE MOURNS DENMARK'S MUSE
AT THE GRAVE OF HER BELOVED SON

These impressive words were inscribed on the upper panel of the tombstone (P. 10) which *Nicolai Abraham Abildgaard*, at the time Director of the Academy of Fine Arts, created for the grave of his elder brother *Peter Christian Abildgaard* at the Assistens Cemetery in Copenhagen. The author of the inscription was *Chr. Colbjørnsen*, Procurator General of the Danish Chancellery, who had acquired great merit as Secretary of the Rural Reform Commission, set up in 1786, by drawing up the legislation for the Acts which resulted in the abolition of villeinage, and consequent liberation of the peasantry in Denmark. According to other contemporary descriptions the plain words of the Epitaph give a very precise picture of Abildgaard, particularly his human qualities.

Peter Christian Abildgaard's gravestone in Assistenskirkegaard, Copenhagen.
Print by *Gerhard L. Lahde* (1765—1833).

HER HVILER

PETER CHRISTIAN ABILDGAARD

PROFESSOR

VETERINAIR SKOLENS STIFTER OG LÆRER

SECRETAIRE I VIDENSKABERNES SELSKAB

FØDT I KIØBENHAVN DEN 22. DEC. 1740

HVOR DØDEN LUKKEDE HANS BLIDE ØIE

DEN 21. IAN. 1801

SOM VIDENSKABSMAND

VAR HAN KIENDT OG HÆDRET I EUROPA

FOR LÆRDOM OG UDBREDTE KUNDSKABER

SOM EMBEDSMAND

AGTED FOR UTRETTELIG

OG GAVNRIG VIRKSOMHED

SOM BORGER OG MENNESKE

ELSKET FOR VENNESALIG FROMHED

USVIGELIG TROFASTHED

OG ÆDEL BESKAFFENHED

DERFOR VÆDE VENSKABS TAARER HANS ASKE

DERFOR SØRGER DANNEMARKS MUSE

VED SIN ELSKTE SØNS GRAV

Inscription from P. C. Abildgaard's tombstone.

CHILDHOOD

Peter Christian Abildgaard was born in Copenhagen on 22nd December 1740. He was the son of the Norwegian-born draughtsman and student, *Søren Abildgaard* (1718—1791), and his Danish wife *Anna Margrethe Bastholm* (1717—1793). The father later became chief draughtsman at the Royal Privy Archives.

Up to his twelfth year P. C. Abildgaard was taught by his father, not only in traditional school subjects including Latin, but also in the art of drawing, as well as chemistry and mineralogy. These years of instruction undoubtedly formed the basis for P. C. Abildgaard's interests and abilities in the arts and natural sciences. At the age of eleven he entered the Copenhagen Cathedral School, later called the Metropolitan School.

The strained economy of his parents was the reason why the boy had to leave school at the age of fifteen to become apprenticed to the apothecary *J. D. Cappel*, first at the King Salomon Pharmacy, and later the same year at the newly-established King Frederick's Hospital's Dispensary. J. D. Cappel and his assistant, *F. H. Müller* (later the founder of *Den kongelige Porcelænsfabrik*), were skilled in chemistry. And because P. C. Abildgaard was an industrious and interested pupil, he soon became quite well versed in both pharmacy and chemistry. However, besides giving full satisfaction as a chemist's apprentice, he studied secretly in his sparse time off to qualify for matriculation to Copenhagen University, and he passed the examination in 1760.

His wish to embark on a scientific course of study was now fulfilled, and he set to work at once. He passed the examination in philosophy, and in 1762 he was awarded a baccalaureate (ba-

Nineteenth-century reconstruction of *King Salomon Pharmacy* in Østergade, Copenhagen. Both buildings belonged to the pharmacy and date from the second half of the 1700s. The doorway on the left flanked by columns was the public entrance. Drawing *Alfred Larsen.*

chelor's degree) for a paper on the usefulness of chemistry to the national economy. With his customary zeal he took up medical studies in earnest, while at the same time utilizing his artistic abilities, *inter alia,* by helping to illustrate Bishop *Erik Pontoppidan's Danske Atlas*, and as amanuensis he also took care of a large part of the general practice of Professor *B. J. de Buchwald,* the skilful obstetrician. His industry and ability earned him a scholarship to increase his knowledge of medicine by a year's study tour abroad.

However, an outbreak of the dreaded cattle-plague (rinderpest) in 1762 changed the purpose of the scholarship. It cannot be ascertained how long this disease has been in existence, but in the earliest part of our era the pestilence spread in a westerly direction from South-East Europe, particularly in the wake of migration and armies. About A. D. 809—810 a severe epidemic, presumably rinderpest, approached Denmark with the armies of Charlemagne pushing northwards through Europe. At the river Eider these armies met the Danish army, led by King Gottrik. Whether it was the presence of the Danish army north of the Eider, or the fact that all the cattle for supplies south of the river had succumbed to the plague, which put a stop to the advance of Charlemagne shall be left unsaid here.

Since then there appears to be no reports of any occurrence of this disease in Denmark until the year 1744, after which a seven-year epidemic raged all over the country with a loss of two million head of cattle. After 1752 there was a ten-year break, but in 1762 it was introduced again from the east via cattle for supply to the Russian troops taking part in the Seven Years War, and in this way the cattle following the Danish army in Mecklenburg was infected. Remembering the catastrophic course of the previous epidemic, the authorities at once sounded the alarm, and as a first measure two medical students, Urban Bruun Aarskov and Jens Bang were appointed to investigate "the aforesaid cattlesickness". These examinations however did not bring forth any fresh information concerning the cattle-plague.

GAZETTE DE FRANCE,
DU VENDREDI 19 AOUST 1763.

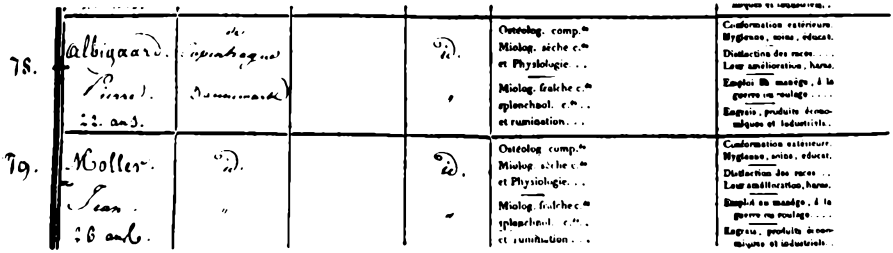
De Lyon, le 9 Août 1763.

On a annoncé dans la Gazette du 8 du mois dernier que le Roi de Danemarck avoit envoyé ici les ſieurs Moller, Abildgaard & Backhauſen pour y étudier en Médecine & en Chirurgie, mais l'objet de leur voyage eſt de ſuivre pendant trois ans à l'Ecole Vétérinaire établie en cette Ville par Arrêt du Conſeil du 4 Août 1761, les Cours d'Etudes relatifs aux maladies des beſtiaux. La contagion qui a fait dernierement de ſi grands ravages en Danemarck a déterminé le Miniſtre de cette Cour à conſulter le ſieur Bourgelat, Directeur de l'Ecole Vétérinaire, ſur les moyens de remédier à ce fléau: ce dernier a indiqué, autant que l'éloignement pouvoit le permettre, la méthode qu'il convenoit d'employer, & c'eſt d'après le ſuccès de ſa conſultation que Sa Majeſté Danoiſe s'eſt déterminée à envoyer les trois Sujets qui viennent s'inſtruire à l'Ecole Vétérinaire. Les Eleves de cette Ecole ſont au nombre de quatre-vingt: le ſieur Bourgelat en a envoyé pluſieurs en Bourbonnois, en Auvergne, en Limouſin, en Dauphiné & en Bourgogne, & par-tout ils ont guéri les maladies des beſtiaux & indiqué les moyens de prévenir ou de faire ceſſer l'épidémie.

From Gazette de France No 66, Friday 9th August 1763 mentioning *Müller's, Abildgaard's* and *Bachhuusen's* journey to France.

JOURNEY TO FRANCE

On 1st April 1763, the Danish envoy in Stockholm *J. O. Schack Rathlou* wrote to the Danish Minister of Foreign Affairs, *J. H. E. Bernstorff*, and informed him that on account of the livestock plague, (i.e. cattle-plague), the Swedish government had chosen three State scholarship holders (among them *Peter Hernqvist*,



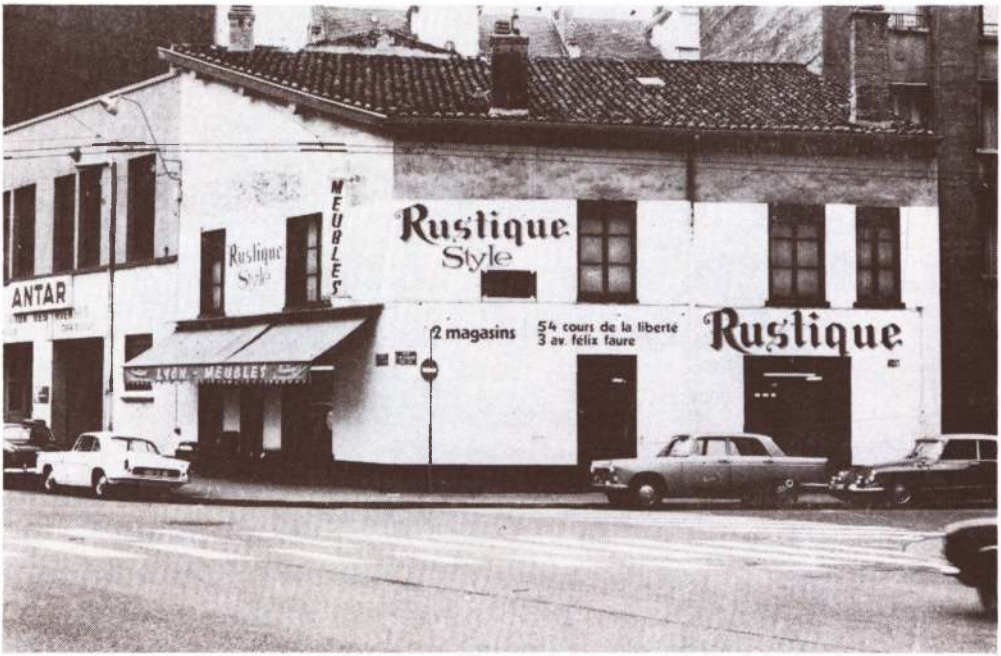
Page of the matriculation register of *Bourgelat's* Veterinary School, with *Abildgaard* entered as "Pierre Albigaard" on 22nd August. A later entry recorded that he had gone "to Sweden to establish a veterinary school" (sic!).

founder of the Swedish Veterinary Institute in Skara in 1775) to attend the recently established Veterinary School in Lyons, and he recommended the Danish State to do the same. The Medical Council strongly seconded this recommendation to King Frederik V, and on behalf of the Danish State two students of medicine *Peter Christian Abildgaard* and *D. Müller*, and one student of surgery, *Bachhuusen* were appointed to go to Lyons. Everything was speedily arranged, and the three students journeyed to Lyons and were matriculated at the Veterinary School there by Professor *Claude Bourgelat* on 27th September 1763 for a period of three years.

From a veterinary point of view the study tour was certainly not a total success. Müller had to leave the school rather quickly because of serious disagreements with Bourgelat, and another student, *Kröyer*, sent to fill the vacancy, was attacked by tuberculosis and died shortly after his return to Denmark. Bachhuusen completed his studies, but after returning to Denmark he found work as a smallpox inoculator and never did any veterinary work.

Teaching at *Bourgelat's* School at Lyons.

Abildgaard completed his studies in the course of two and a half years, but it seems due mostly to his own diligence and pleasant disposition that he gained as much benefit from his stay in Lyons as he in fact did. The true purpose of the journey, which was to study diseases in cattle — particularly the cattle-plague — could not be met in Lyons where the horse was the only domestic animal considered worth teaching about. Up to 1790 internal medicine was not taught at the Lyons school. Abildgaard's own feelings about his study sojourn is on record in a still existing, undated draft by his own hand: "*I, a lover of horses, found it very useful to learn about them, and I thought that perhaps a similar institution in my Fatherland — whose most important livestock is horses and cattle — might be of much benefit, and that unfortunately it was my duty not renounce my stay, particularly as the Royal Command gave no definite specifications, only that we should acquire insight into the science taught at the school. Therefore I stayed on for three years, and endured the multitudinous annoyances which had to be tolerated from a competent, but extremely proud and vain teacher.*"



The building which once housed *Bourgelat's School* in *Lyons*. (Photo: M. *M. Mammerickx* 1972).

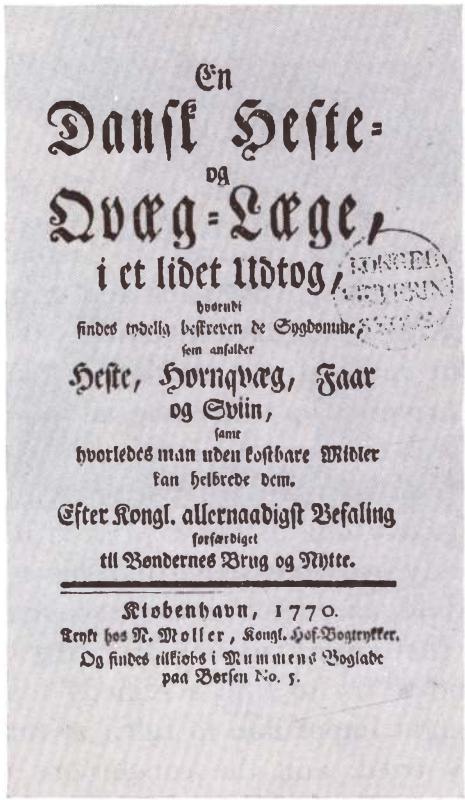
One reason for these irritations was that Abildgaard was not satisfied with Bourgelat's instruction in theoretical and practical hippiatrics, but supplemented his studies through the teaching of the physicians *Guerin* and *L. Vitet* in respectively human medicine and comparative anatomy, and pathology; the latter teacher was utterly detested by Bourgelat.

RETURN TO DENMARK

In April 1766 Abildgaard returned to Denmark, just in time for the reorganization in government and administrative circles after the death of King Frederik V in January the same year. After his homecoming he realized that the interest in a Danish veterinary service had shrivelled up to nothing, and with it all that he had looked forward to as the aim of his life. Only one of his former well-wishers, the physician to the royal household *J. J. V. Berger* worked, as Abildgaard himself has expressed it, tirelessly for the purpose that the stay in Lyons should not have been in vain, and he ensured that Abildgaard kept his State scholarship for a further two years with the object of investigating the cattle-plague on Danish soil and to try to find a remedy for it, a task Abildgaard rightly thought impossible to fulfil at that time. However, he conscientiously tried, and the conclusions of his experience with the cattle-plague are set down in the book *En dansk Heste- og Qvæg-Læge i et lidet Udtog* . . . (A Danish horse and cattle doctor in a small abstract . . .) the first edition of which was published anonymously in 1770.

Abildgaard soon came to feel that his work in veterinary science was in vain and he devoted himself therefore to medical studies. Two years later he passed the final examination and he graduated as a doctor of medicine on 7th September 1768 with a thesis: *De venaesectione in suppressis menstruis* (The influence of bleeding on the suppressing of menstruation). About two months earlier he had married *Margrethe Kirstine Jagenreuter*, daughter of goldsmith and captain in the civil guard, *Johan Jagenreuter.*

In spite of aversion in some circles against Abildgaard as a physician because he had also been engaged in veterinary work, and thus had almost placed himself on a level with the vile


En
Dansk Heste-
og
Qvæg-Læge,
i et lidet Udtog,
hvorudi
findes tydelig beskreven de Sygdomme,
som anfalder
Heste, Horngvæg, Faar
og Svin,
samt
hvorledes man uden kostbare Midler
kan helbrede dem.
Efter Kongl. allernaadigst Befaling
forfærdiget
til Bondernes Brug og Nytte.
Kiøbenhavn, 1770.
Trykt hos N. Møller, Kongl. Hof-Bogtrykker.
Og findes tilkiøbs i Mummens Boglade
paa Børsen No. 5.

Title-page of *Abildgaard's* book
on the diseases of horses and cattle.

knacker, he soon succeeded in working up quite a remunerative medical practice which he continued after founding the Veterinary School in Copenhagen.

That his work as a physician before long gained him respect is evident from the number of positions of trust within the science of medicine which he was asked to accept. In 1775 he became *Stadsfysikus* (Chief Medical Officer) of Copenhagen, he became member of *Jordemoderkommissionen* (Commission for Midwives), of *Quarantainecommissionen* (Quarantine Committee) and the *Collegium Medicum*. He was also very active in *Selskabet for Druknede og Skindødes Redning* (Society for the Rescue of the Drowning and Asphyxics).

P. C. ABILDGAARD THE VETERINARIAN

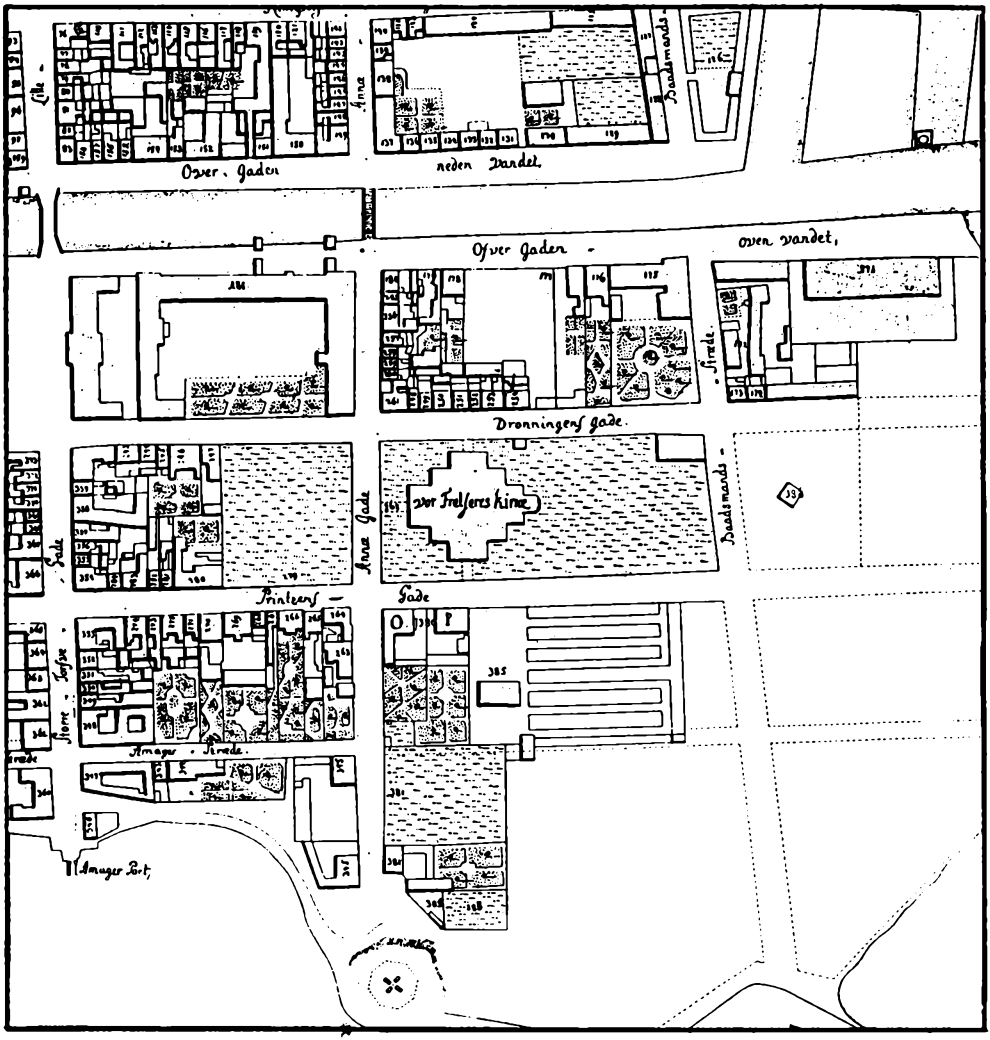
In 1771 Abildgaard had, as he puts it himself, quite taken leave of all veterinary activities which he did not expect ever to be of any use to him. All the same, in response to the request of a bookseller, he published a 256-page book entitled: *Unterricht von Pferden, Kühen, Schaafen und Schweinen, wie man dieselben warten und aufziehen muss...* (Informations on horses, cows, sheep and pigs. How these must be tended and raised...). It was a relatively poor translation into German of a Danish manuscript which he had been asked to write in 1767 by Count *A. G. Moltke*, but only now, after four years, was it published. It became this work which reactivated the idea of a Danish veterinary school.

By chance the botanist, Professor *C. C. Oeder*, who was also a physician and national economist got hold of this book. He drew the attention of Cabinet Minister *J. F. Struensee* to the possibilities it represented in the veterinary field, whereupon Struensee summoned Abildgaard to a meeting at Hirschholm Castle where a royal decree was put before him, charging him with the task of planning a veterinary school connected with the stables at Frederiksborg Castle. Here he should as a professor instruct the entirely unschooled stable staff in the anatomy and diseases of horses so that these as horse-doctors "*Could be taught just the simple elements of anatomy and the art of healing so that they at least did not kill the animals entrusted to them by their fellow citizens, even if they not could cure them*". This decree was in no way in agreement with Abildgaard's plans for his future, and he succeeded in convincing the minister that such a scheme would be far too expensive for the royal treasury.

Instead he was directed to work out plans for a veterinary school near to Copenhagen. At the same time he was ordered to

attend the royal stables and stud farms if cases of special importance should arise. Particularly this last order put a very heavy burden upon him because he often had to be away from his medical practice for several consecutive days, and besides it was very difficult to collect any fees for this enforced veterinary work, so that Abildgaard predicted his own bankruptcy. Nevertheless, he worked out plans for a Veterinary School. Several reasons favoured a site in Christianshavn, it would be practicable for voluntary listeners from the city of Copenhagen (weather conditions notwithstanding) to come on foot to the lectures. Also the many cases of malpractice on horses in a city like Copenhagen will always give a sufficient supply of patients for the students, and moreover carcasses from the anatomical exercises and the stables could be disposed of at a nearby salpetery.

The plans which Abildgaard discussed with Struensee and with the Royal Master of the Horse took shape, they comprised, besides the site, the purposes of the school, its constitution with farriery, treatment stable, an ambulatorium, the curriculum which had to be taught, as well as the staff to be attached to the school and its duties. It was discussed who could attend the instruction as voluntary hearers and as duty-bound pupils, and last but not least a budget was set up for the establishment and management of such a school. Struensee's sudden downfall and imprisonment on the night between 16th and 17th January 1772 put temporarily a stop to the negotiations.



Detail of a map of the Christianshavn quarter completed c. 1757. Plots are numbered and the names of the owners are recorded. The undeveloped square (no. 279) bounded on three sides respectively by the streets: Dronningensgade, Skt. Annæ Gade, and Prinsensgade (now Prinsessegade), is the site on which the Veterinary School was built sixteen years later.

ESTABLISHMENT OF THE VETERINARY SCHOOL

In the winter 1771—1772 the horses in the royal stables were attacked by an acute, contagious disease with high mortality, and as previously arranged Abildgaard was summoned. He was quite soon able to establish that the trouble was a violent but genuine peripneumonia (malignant lung-sickness). By then about 40 horses had died in spite of the presence of all the famous farriers from far and near. In spite of resistance from these farriers Abildgaard before long succeeded in getting the disease under control, and the rest of the horses in the royal stables were saved.

In consequence of this the king's half-brother and heir presumptive, Prince Frederik, had the interrupted negotiations resumed, and a royal decree of 18th June 1772 ordered the establishment of a veterinary school "Outside the city gates". A committee was also formed comprising the Master of the King's Horse, *Hans Henrik von Bülow, Count J. G. Moltke,* Chief Studmaster *Heinrich von Levetzow* and *P. C. Abildgaard.* The purpose of the committee was to prepare more precise plans for the whole project. These were largely Abildgaard's work, and they were approved, and the foundation charter of the Danish Veterinary School in Christianshavn was issued on 4th January 1773. Accordingly, P. C. Abildgaard at the age of thirty-three was nominated the administrator and sole owner of the school as well as its headmaster and only teacher. He received the appointment of professor and headmaster 25th January 1773, and he was also made financially responsible for the acquisition, organisation and running of the school. For this he would receive 1,200 *Rigsdaler* a year from the State treasury. This sum included his salary as professor and fee covering all kinds of treatment as required for the king's horses.

The Church of Our Saviour in Christianshavn, 1764. The building on the left later became the Veterinary School. (*Pontoppidan:* Danske Atlas 1763—1781).

After this Abildgaard bought for 5,000 *Rigsdaler* (which he obtained as a 4 % mortgage loan) a piece of marshy land with a brick-built house at the corner of St. Annægade and Dronningensgade in Christianshavn. To be able to undertake the necessary filling in of the swampy ground and the improvement of buildings, Abildgaard had to ask for an advance of 800 *Rigsdaler* from the Treasury to be deducted from his first four annual payments of salary. The area of the land was 2,100 m^2, but increased to 2,750 m^2 through a later additional purchase. The original buildings accommodated Abildgaard's residence, a lecture room and a stable for six horses; in a new building there was a room for anatomy instruction as well as a stable for eight horses. The entire fitting out of the premises was completed in the first half of 1773 so that Abildgaard could start teaching on 13th July the same year with some twenty pupils in attendance, most of whom were military or royal riding masters and farriers. The first public examination was held on 15th February 1775, ten

pupils went up for it, five of them passing with particular distinction. (The first qualifying examination for veterinary surgeons was held in 1779). For the first two years Abildgaard had been assisted full-time by a farrier, and besides this there was also a military surgeon in the winter to prepare the anatomical exercises.

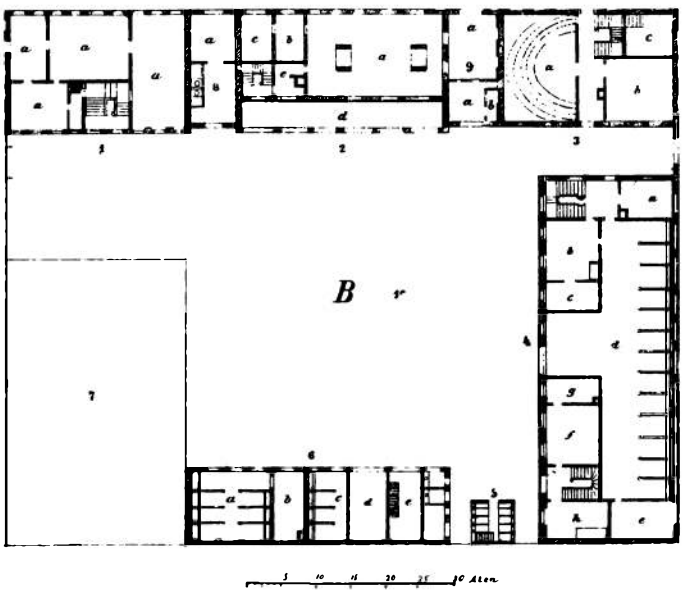
It was obvious not only to Abildgaard but also to the State officials, who as board of governors supervised the School, that an expansion was needed to make the instruction effective. It was equally evident that Abildgaard's private economy could not bear the cost. An exact account of the activities of the School in the first two years showed that, everything considered, there only remained 199 *Rigsdaler* for Abildgaard personally (or 40 % of what he had received ten years before as a State scholarship when a student over a corresponding period).

For this reason it was decided to let some funds under the Treasury contribute toward improvement, and in the spring 1776 the School was enlarged by a new building to house a much needed farriery, as well as living quarters for a farrier and for sixteen apprentices (pupils), and additional stabling for another sixteen horses.

The deliberations concerning expansion also lead to the proposal that the School should be a self-governing institution, and on 9th June 1776 the King resolved that Abildgaard should renounce his ownership of the School and receive the sum of 7,715 *Rigsdaler* in compensation. He was to continue to be paid a salary of 1,200 *Rigsdaler* a year, and finally 1,200 *Rigsdaler* annually should be available as salary for two resident students (assistant teachers) and a shoesmith. This expansion of facilities and personnel enabled the accommodation of pupils who were sent in both from Danish cavalry regiments, and from various estates which paid for their training.

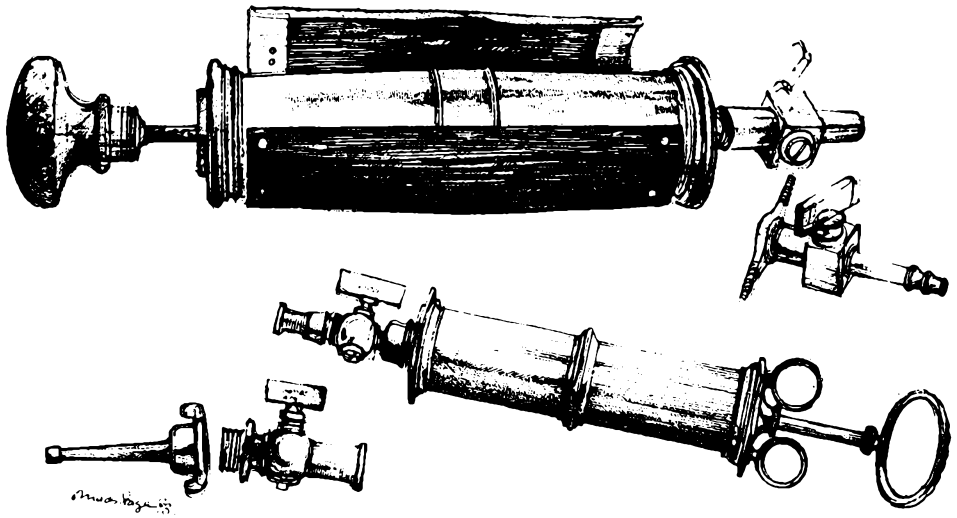
In October 1792 it was further decided that each of the eleven dioceses in Denmark and Norway should keep an apprentice (diocesan apprentice) at the School for the scheduled three-year course. The apprentices in question should "be out of peasant stock, eigh-

Part of the Royal Veterinary School c. 1821 seen from the courtyard with the Church of Our Saviour in the background. After a print by *H. G. Holm* 1822.



Plan of the Veterinary School (after H. C. Tscherning's Efterretning om den Kongelige Danske Veterinairskole, Kjøbenhavn 1851).

Ground-plan. 1. Museum, a) Museum room. 2. Farriery, a) Forge, b) Lathe room, c) Coal and iron stores, d) Farriery shed, e) Office. 3) Buildings with reading-room, a) Reading-room, b) Anatomy room, c) Chemistry laboratory. 4. South stable block, a) Porter's room, b) Medical room, c) Office, d) Stable, e) Fodder stores, f) Dispensary, g) Office, h) Laboratory for the dispensary. 5. Dog kennels. 6. West stable block for large livestock, a) stable and cowshed. b) Living-quarters, c) Stable, d) Woodshed, e) Cart-shed; to the right: store-room. 7. Garden. 8. Inner yard, a) Cart-shed. 9. Inner yard, a) Dissecting room, b) Dog kennels. 10. Courtyard.



French brass syringes with wooden cuffs, imported in 1796 by Professor *P. Chr. Abildgaard*, the founder of the Veterinary School. Used for injections in anatomical studies of blood vessels and other canal systems. Manufacturer: Charrière, A., Paris. Illustration: Le Gendre au Pantographe à Paris. Permit issued by the Copenhagen Customs for the import of French brass syringes has been found in the municipal archives by *F. Elvinge* in 1970s.

teen to twenty-five years of age, be in a possession of reasonably good faculties and preferably have learnt to write". The standing of the School as an academy was finally confirmed when the King signed the charter of foundation on 23th July 1777 of the Royal Veterinary School. For Abildgaard the new arrangement meant a very great economic relief. On the other hand, the teaching work grew rapidly because of an increasing number of pupils, several of whom came from abroad, called by Abildgaard's high reputation. This made it necessary for Abildgaard in 1782 to renounce his practice as physician with all its obligations.

VETERINARY EDUCATION

The veterinary course was to last three years, and four public lectures were held every week. For the real disciples, who were resident at the School, four additional refresher lessons were given weekly. There were, moreover, lectures each Sunday for apprentice smiths and journeymen from the Copenhagen area. Most of the instruction was given as exercises, for half the week the pupils practised the art of shoeing and in the next half they looked after the sick animals in the stables. In addition to this there was dissection practice during the winter months, and in the summer training in surgical technique. Autopsy was performed on all animals that died at the School.

The allotted assistance, specially the appointment of the farrier, met a long-felt need. The first to fill this post was a German farrier, *J. A. Holzschwarz*, who was trained by *Ph. E. Lafosse* (fils) in Paris. He stayed for approximately five years after which he settled as a farrier in Copenhagen. He was succeeded by *Christoffer Ewald* who had qualified at the School as a veterinary surgeon in 1780. He thus became the first veterinarian appointed to it.

The so-called resident students seemed not to have been very helpful as assistant instructors in the first years because of a very rapid turnover until 1783, when the young lecturer in botany at the University, *Eric Viborg*, who in two years had attended all the public lectures at the Veterinary School, was appointed to a lectureship at the School. That same Viborg became second professor in 1796 and upon Abildgaard's death in 1801 he succeeded him as principal of the School. In the late 1790s when Viborg was often

Professor *Eric Viborg*.

travelling, Abildgaard got an enthusiastic and very devoted assistant, *Jens Veibel Neergaard*, a young law student, who was also a horse lover.

Abildgaard had been a naturalist in the true sense of the word since his student days, and although it is incredible how he found time for it, he had as a student made himself widely known for his endeavours in natural science. It was characteristic that besides investigating ideas he conceived as he went along, he also promptly tested with exceptional results what others had published as research. Thus when the English physician *Edward Jenner* published his observations on smallpox in 1798, Abildgaard at once

ordered vaccine from England and he carried out the first human smallpox vaccination at the Veterinary School.

Likewise, when the Montgolfiere brothers on 4th June 1783 succeeded in their experiments with the hot-air balloon at Annonoy in France, Abildgaard also constructed a so-called aerostatic balloon. The first trial was unsuccessful but already on 5th January 1784 Abildgaard's balloon rose into the air from the forecourt of Christiansborg Castle.

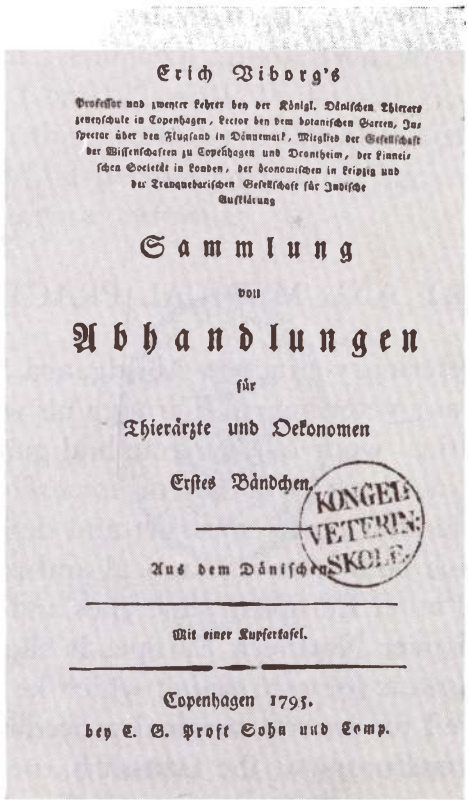
The open forecourt of Christiansborg Castle from where *Abildgaard's* "aerostatic balloon" was sent up.

LITERARY PRODUCTION

In view of this zeal it may seem strange that only a few papers on veterinary science were published by him in spite of the fact that this field after all became his life-work. He alleged, however, that much was present as drafts for final polishing, but "it is rather tiresome work to instil in common people, whose minds are untrained, reasonably clear concepts of scientific matters so that one, in spare hours however few because of other duties, becomes weary of reading and improving what one has already written".

Besides *En dansk Heste- og Qvæg-Læge...* (A Danish horse and cattle doctor...) published in 1770 which was issued in new and improved editions in 1783 and 1791, the only major work in veterinary pathology is a thesis on the cattle-plague published in *Adresseavisen* (A Copenhagen advertising paper) in 1779, but later translated into German and printed in 1795 in the periodical *Sammlung von Abhandlungen für Thierärzte und Oekonomen.* In this Abildgaard reports all his observations concerning the disease and its manner of infection, and he likewise stated that isolation and slaughtering are the only methods by which it can be controlled. It is also the reason why the disease could be regarded as eradicated in this country in 1781. After this the method rapidly came into use for effectively fighting the disease in neighbouring countries to Denmark.

He also published a few minor veterinary works. Thus in 1790 he issued *Underretning for Landmanden om den nu herskende Leversyge hos Faarene* (Report for farmers on the present widespread liver sickness in sheep), and in 1794 he wrote a brief note *Bemærkninger over tvende Faar med Ringsyge* (An account of



Erich Viborg's

Professor und zweyter Lehrer bey der Königl. Dänischen Thierarzeneyschule in Copenhagen, Lector bey dem botanischen Garten, Inspector über den Flugsand in Dännemark, Mitglied der Gesellschaft der Wissenschaften zu Copenhagen und Drontheim, der Linneischen Societät in London, der ökonomischen in Leipzig und der Tranquebarischen Gesellschaft für Indische Aufklärung

Sammlung

von

Abhandlungen

für

Thierärzte und Oekonomen

Erstes Bändchen.

Aus dem Dänischen

Mit einer Kupfertafel.

Copenhagen 1795.

bey C. G. Proft Sohn und Comp.

Sammlung von Abhandlungen
für Thierärzte und Oekonom. Title-page.
Copenhagen 1795, Vol. I.

two sheep with staggers). The year before he was commissioned by the Danish Chancellery to write a handbook on *Raad imod de almindeligste Sygdomme hos de vigtigste Huusdyr, til Brug for Bondealmuen* (Advice on the treatment of the most common diseases in the most important livestock kept by the peasantry).

It should be noted that Abildgaard has also described a series of parasites both in mammals, birds and fishes, but these works must be regarded more as systematic zoological (rather than pathological) descriptions.

IN VETERINARY AND MEDICAL PRACTICE

In the field of veterinary practice Abildgaard also soon made a name for himself as a veterinarian. Through his whole-hearted participation in practical work in Lyons he had gained a very sound all round insight, not least in the art of *horseshoeing*, and for this reason he was able later on to construct and describe a horseshoe, (pp. 40—41), which both from a practical and physiological point of view surpassed other European shoetypes and therefore rapidly came into use all over Northern Europe. It should also be mentioned that the *harness for restraining* which he invented and developed is still used for several surgical procedures in horses, and it is known all over Europe as the Danish harness for restraining.

It was not least because of his practical proficiency that the leadership of the veterinary school in Hannover (then a few years old) was offered to Abildgaard in 1791. He declined, however, among other thing because of his already failing health.

It may be regarded as an object of curiosity that Abildgaard organized the first Danish Health Insurance for animals by concluding an agreement on behalf of the School with the members of the Union of Spirit Distillers in Copenhagen (these were then the keepers of dairy cows within the ramparts of Copenhagen). According to this agreement the School undertook against a fixed remuneration per head of cattle the obligation to treat the insured cows both ambulantly as well as clinically, and also to remove the carcasses of the cows which died in the cowsheds.

Abildgaard soon also came to play an important part in Danish stockbreeding. Thus he was a very active member of *Det*

kongelige Danske Landhuusholdningsselskab (The Royal Agricultural Society of Denmark), almost from its founding in 1769, and in the period from 1774 to 1778, he was vice president of the society. Through this work he established contact with some of the most important persons in Danish agriculture, just in the period around the rural reforms.

Emblem of The Royal Agricultural Society of Denmark, founded 1769.

In 1771, as mentioned before, he published the book on the tending and breeding of horses, cattle, sheep and pigs, a book he had prepared in 1767. (It was in this book that Abildgaard first imparted his theories concerning the correct forging of horseshoes). Later it was particularly the breeding of horses and sheep which claimed his attention. He worked zealously for an improvement in the breeding of sheep, particularly with regard to wool quality, and he introduced the import of fine wool sheep of Spanish descent from Sweden for breeding purposes.

Experiments, among others at the royal sheep breeding station at Lynggaarden, Gladsakse, convinced him of the superiority of the Spanish sheep over our national breed and cross-breeds, and during his extensive travels abroad in 1793—1794 staying in Germany, Italy, Portugal and Spain he personally looked into the living conditions of these fine Spanish wool sheep in their homeland. The outcome of this journey was among many other things a

direct import from Spain of sheep for breeding, and moreover the publication in 1800 together with E. Viborg of *Veiledning til en forbedret Faareavl og de spanske Faars Behandling i Danmark og Norge* (Guide to improved sheep breeding and the care of Spanish sheep in Denmark and Norway). From the early 1770s he had to inspect the royal stables and studs when anything serious came up, and in any event at least four times a year he, with his usual thoroughness, gained considerable insight into the rearing conditions in the studs. For this reason it was a matter of course that he became a member of the committee, appointed by royal decree of 14th March 1776, whose task was to investigate how the royal studs at Frederiksborg Castle, with its up to eight hundred breeding horses, could regain the fame within the realm of horse breeding it had enjoyed only a few years back. It is characteristic that all the submissions of the committee after that were prepared and signed by Abildgaard, neither is it surprising that he was elected in 1789 as a member of the board of directors to supervise the Frederiksborg studs. Not least by virtue of this appointment he obtained considerable influence upon the ruling of various decrees issued in those years concerning the studs.

In 1790 he was sent on an official journey through Denmark and the Duchies of Schleswig-Holstein with the object of studying not only the breeding of the Frederiksborg stock, but also all other domestic breeds of horse. After his journey he published in 1795 a statistical report about the condition of horse breeding in Denmark and the Duchies.

He also visited the island of Heligoland on that journey, where he took time off to investigate the flora and fauna of the island and compile a catalogue of plants and animals on the island. The catalogue was first published four years after the death of Abildgaard. It comprises thirty species of plants, among them four sorts of algae, one hundred and two species of animals, viz. nine mammals, eleven birds, twenty-eight fishes, twenty-one insects, as well as thirty-three species of "worm and wormlike animals". In addition there is a list of birds which visited the island as migrants.

Veiledning

til en

forbedret Faareavl

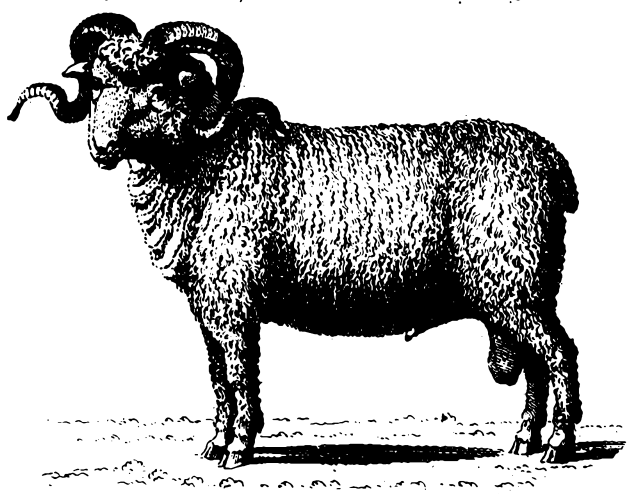
og

de ſpanſke Faars Behandling

i Danmark og Norge.

Ved

P. C. Abildgaard og C. Viborg.



Kjøbenhavn, 1800.

Trykt paa H. Likjobs Forlag, hos J. Breum.

Guide to improved sheep breeding and the care of Spanish sheep in Denmark and Norway. (Title-page).

Peter Christian Abildgaard by an unknown artist, probably from the end of the 1770s. (Museum of National History, Frederiksborg). Detail of painting.

In 1800 Abildgaard and Viborg together published *Iagttagelser om Anvendelse af Byg til Hestefoder i stedet for Havre* (Observations on the use of barley as horse fodder instead of oats).

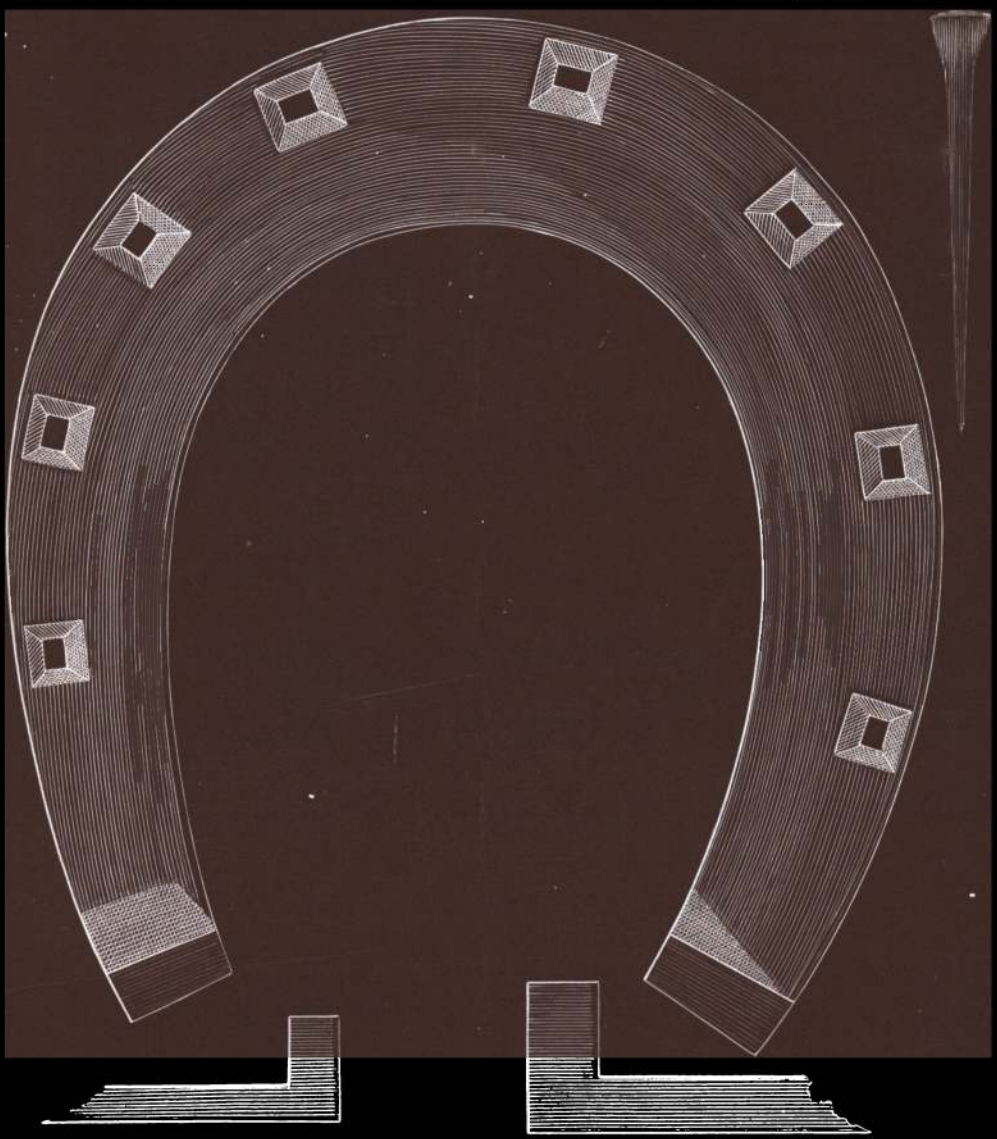
As a medical practitioner, Abildgaard was a respected and esteemed physician, not least by his patients. His practice was not particularly large, but very stable, and among his patients were most of the foreign envoys as well as several persons from circles connected with the Court. This caused in some cases envy among colleagues, for instance the physician and historian *N. D. Riegel*, who accused Abildgaard of meddling in Court matters, rather than minding his work as a veterinarian. The said Riegel went on with his rather spiteful attacks on Abildgaard a long time after he had closed his medical practice. Finally they became so insulting that Abildgaard joined issue with him. The controversy was brought to an end by Abildgaard's publication of *Additamentum XII ad commentationem historicam de fatis faustis et infaustis*

chirurgiae — sive Regii Instituti Veterinarii Hafniensis brevem historiam (12th addendum to the historical treatise on the success and adversity of surgery — or a short history of the Royal Veterinary School of Copenhagen). This publication, issued in 1788, was very valuable not least because Abildgaard here in his own words reported about the foundation of the Veterinary School and the first years of its existence.

In the period between the defence of his doctoral thesis *De venae sectione in suppressis menstruis* (dedicated to the Chancellor of the Exchequer A. P. Bernstorff) and the establishment of the Veterinary School, Abildgaard had only time to prepare a couple of papers on medical subjects, both of them translations of Swedish works which he provided with his own comments. The works in question are a treatise on children's diseases and their cure, and one on diet or how to conserve one's health by selecting the necessities of life.

After the founding of the Veterinary School, Abildgaard wrote several minor papers on widely different medical subjects, all of them written in Latin and published in *Acta Societas Medicae*, Copenhagen. After 1782 when he gave up his medical practice these publications also ceased, there was no time for them any more. All the same, he continued up to his death to work for the Society for the Rescue of the Drowning.

Horseshoes constructed by *P. C. Abildgaard* (overleaf).
Printed from the original copper-plate (early 1800s). Museum of Veterinary Medicine, Copenhagen.



THE NATURAL SCIENTIST

Abildgaard's achievements in the field of natural sciences deserve special notice. Based upon his personal knowledge Viborg writes: "Abildgaard was one of these rare scientists who had a regard for all branches of human knowledge, all the same it was first and foremost the study of natural sciences he pursued. Of these physics, chemistry, mineralogy, zoology and physiology were the most favoured objects of study. He kept in step with the progress of these his sciences. No discovery, no invention, no observation and no new hypothesis remained unknown to and untried by him. Had he neither the time nor opportunity to carry out the necessary experiments, he encouraged others to do so".

Emblem of the Society of Sciences and Letters.

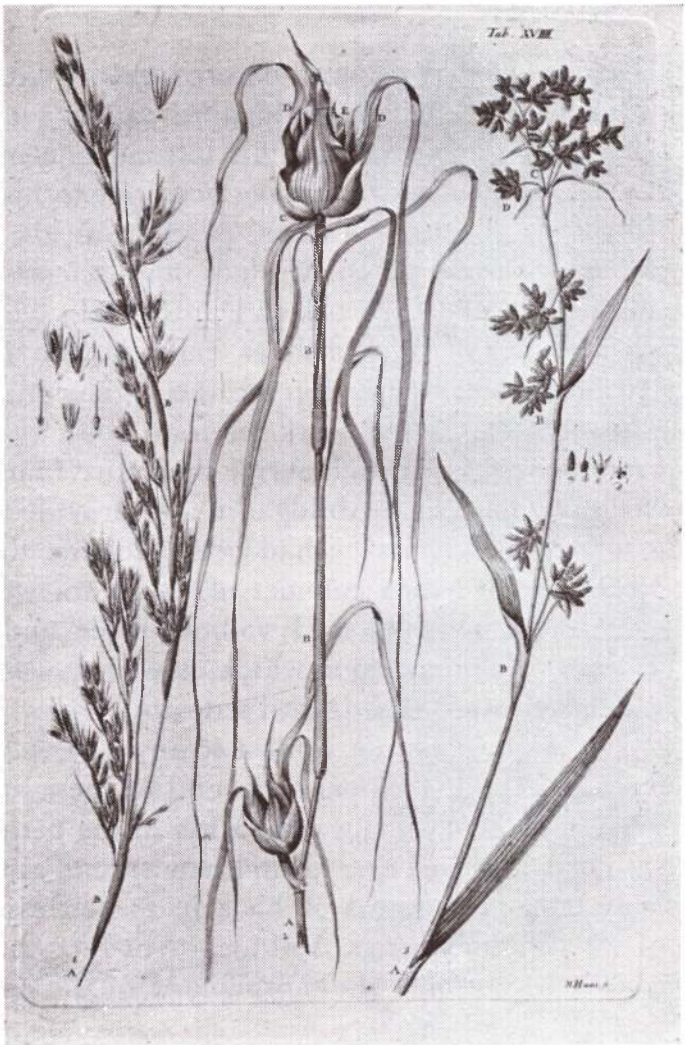
However, this is hardly surprising. His father together with his early teachers had clearly influenced him in that direction when he was young, and in addition to this his inquiring mind made him as Viborg stated, tackle the problems as soon as he came across them. Yet it coincided with a period when natural science

was regarded as quite uninteresting by university circles and was consequently neglected. Because of this almost all students, native as well as foreign who pursued research in natural science in those years, attended lectures at the Veterinary School under Abildgaard's leadership. There was in 1760 in fact established a professorship in natural history at the University, but this professor had to research mainly in mineralogy and chemistry for the benefit of the Norwegian mines. For the same reason the professor in question was transferred to Norway in 1789 and the teaching of natural history stopped completely at Copenhagen University. At the same time, Abildgaard led the establishment of the *Danish Natural History Society* for the purpose of arranging a series of lectures on natural historic topics and to found a natural history collection, and finally for the publication of a series of transactions in which Abildgaard among others published several of his papers on subjects from natural history. That not only Danish but also foreign scientists thought highly of his work is evident by the honorary positions bestowed upon him. Among others he thus very early became a member of the *Society of Sciences and Letters*, and from 1795 until his death he was its secretary. In November 1773 he became a member of the *Physiographic Society* in Lund, Sweden, in 1784 of the *Royal Norwegian Scientific Society*, in 1793 of *Naturforschende Freunde* in Berlin, in 1793 honorary member of *Leipziger Ökonomische Gesellschaft*, in 1796 member of the *Mathematic-physical Society* in Erfurt and in 1796 corresponding member of the *Philotechnical Society* in Paris. In 1799 he became member of the commission for establishing a museum of natural history in Copenhagen. Finally it must be mentioned that the chair in physics at the University of Copenhagen was offered to Abildgaard in 1800, but he declined, primarily on the grounds of ill health.

THE BOTANIST

In the field of botany Abildgaard made himself known particulary through the artistic skill demonstrated by his excellently drawn plates in *Chr. Rottbøll's* work on *Cyperacea*, published in 1773.

Abildgaard published one botanical treatise. In 1791 he tried through historical, anatomical and chemical investigations to refute Inspector Troyel's contemplations on *ergot in rye and stinking smut in wheat.* Even though Abildgaard was wrong in his conclusions that the disease was not, as postulated by Troyel, caused by fungi, the work is valuable for the historic survey on bygone conceptions particularly about ergot. Besides this everything concerning the study of botany at the Veterinary School appears to have been left to Erik Viborg, who also before his appointment at the School had been lecturer in botany at the University of Copenhagen, and it was also he, who from 1795 to 1800 supervised the establishment of the so-called "veterinary garden", a piece of land of about 5 hectares, acquired by the Veterinary School in Amager. It was organized as a herb garden especially with medical herbs for use by the School which was soon able to supply itself and furthermore to sell medical herbs to the chemist shops in Copenhagen, so that the garden out of this profit could pay for the establishment of the School's dispensary in 1813, and also to pay the wages of a manager for the dispensary and for the garden. Furthermore, the garden was used for instruction in systematic botany by students at the School.



A drawing by *P. Chr. Abildgaard.*
From *C. F. Rottbøll's* Atlas on grasses (1773).

THE ZOOLOGIST

Owing to his profound regard for all nature together with his great capacity for scientific thinking Abildgaard rather soon made a name for himself as a zoologist, and his introduction into professional zoological circles appears to have been due to his considerable ability to make precise drawings. Already in his youth this talent was utilized to illustrate the work of other scientists, he thus drew some of the plates for the work on Danish shells which *Frantz Michael Regenfus* began to publish as early as the 1750's. He also began to provide drawings for the theologian and zoologist *Otto Friderich Müller's* great work in four volumes, *Zoologia Danica*, the aim of which was to describe the entire fauna of Denmark and Norway. Quite soon Abildgaard also provided the Latin descriptions of animal species he had been the first to discover. In Müller's lifetime only two volumes of this work were issued, consequently Abildgaard published volume three and also did much of the work on volume four which, however, was first finished and published after Abildgaard's death.

In addition to this large-scale work a score or so of lesser zoological treatises by Abildgaard exist. Several of these are marked by the tendency prevalent among naturalists in the period shortly after the death of Linné in 1778, to find new species and fit them into Linné's system, yet several of his papers demonstrate how far ahead of his contemporaries Abildgaard in fact was because he took into account not only the morphology of the animals but just as much their biology.

It is evident that he was especially interested in one group of animals: the parasites in mammals as well as in birds and fishes and not least here his high standard as a scientist becomes apparent. Only at a much later period has it been possible to realize how far ahead of his time he really was.

He was the first to demonstrate both the metamorphosis and

The fish tapeworm (*Diphyllobothrium latum*) from the intestine of man. The specimen has been collected by *P. C. Abildgaard* and is now in the Department of Zoology, the Royal Veterinary and Agricultural University, Copenhagen. (*Leif Holzmann* photo).

indirect life-cycles (host shift) in these animals. His logical mind did not allow him to rely too much on ideas arrived at merely by reasoning but, as the first naturalist he introduced experiments into parasitological research in order to prove the validity of his theories. A case in point is his paper published in 1790 *Bemærkninger ved Hundesteilens Bændelorm*... (Observations on the tapeworm of the stickleback ... (vd. pg. 72). Also his investigations on the bladderworm in sheep and pigs are ahead of their time. Only in a few cases does he take account of actual pathological conditions in the host-animal in connection with parasitic invasion, as in the previously mentioned papers on fascioliasis and cysticercosis in sheep. However, he knew very well that all parasites under certain conditions might be fatal to the host. This is among other things made obvious in the introduction to a lecture on helminths, given in the Natural History Society in 1790: "*What has been the object of the Creator to include in the Order of Things these, in so many ways, destructive creatures that live in the Living at the cost of the Living? Are they created only to cause suffering in Man and Animals? Or are they, as so many things, just comparatively and as a rare exception harmful, but in general beneficial? The answer to the first and most important of these questions might be briefly this: As it is the fate of this world that all which lives must die and that death must have a cause, then all these creatures are just as worthy and wise tools in the Creator's hand as all other natural causes of death*".

Abildgaard also performed experiments outside the field of parasitology. In his *Nogle Forsøg betræffende Infusions-Dyrenes Oprindelse* (Experiments concerning the origin of infusoria and the causes of putrifaction of water) he demonstrated that the bacteria of infusoria are not to be found in the water itself, but are associated with herbs used in the preparation of the experimental cultures. Therefore it is not the water as such which putrefies but the organisms contained in it.

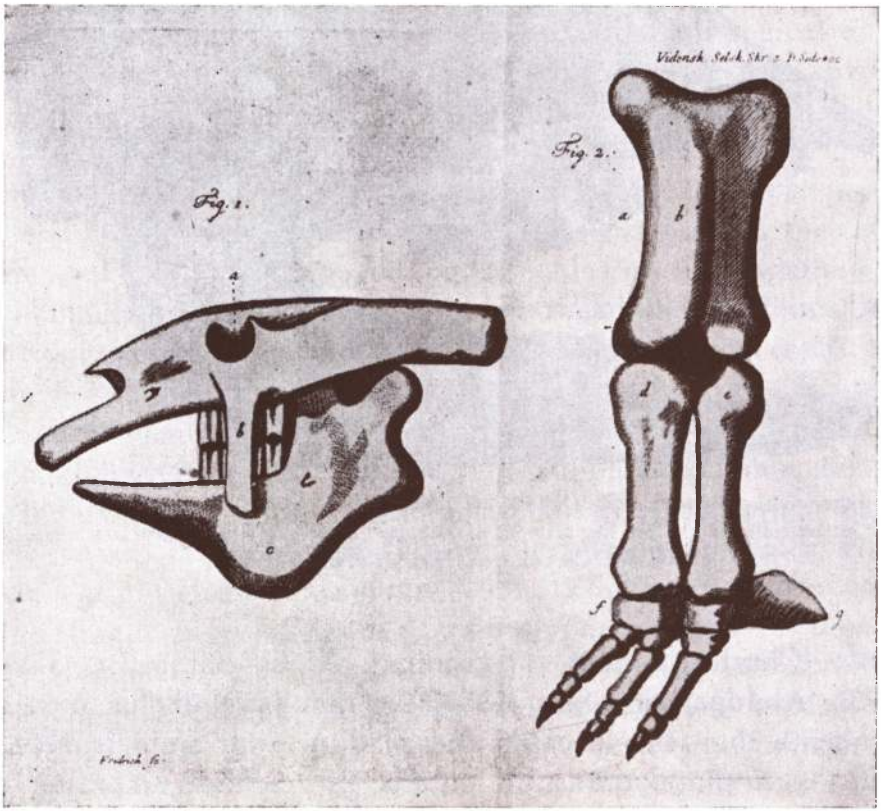
In connection with his *Observations on Bonnet's experiments demonstrating that after decapitation the head regenerates on*

This cranium of a dromedary is labelled "*Abildgaard 1794. Camelus dromedarius i 3.dje Aar*". Now in the collection of the Department of Zoology, the Royal Veterinary and Agricultural University, Copenhagen. (*Leif Holzmann* photo).

snails (Charles Bonnet, a visionary Swiss naturalist, 1720—1793), Abildgaard infers, 1800, on the basis of his own experiments, that what is called the head in lower animals does not in fact merit that name as this anterior part contains no brain. That part which could be called so, is situated further back in the animal.

Whereas Abildgaard has described a number of invertebrates, his description of vertebrates are few and far between. In *Zoologia Danica* he has given one or two descriptions of fishes, and he also proved by his investigations that the hagfish, *Myxine glutinosa*, classified by Linné as a worm, really is a fish, very similar to the lamprey.

During his travels in Spain, Abildgaard visited the Royal Cabinet of Natural Curiosities in Madrid early in 1794, and only few items here could interest him, but he was fascinated by one object, the skeleton of a huge, primeval animal discovered in Peru a few years earlier. As it was forbidden to make notes and draw in the museum, Abildgaard had to rely on his memory for the description and the drawings of the specimens of head and hind limb.



Abildgaard's drawing from memory of the cranium and hind limb of Megatherium.

Based upon this he could ascertain that the animal in question must have been an *Edentate* belonging to the *Myrmeophage*. Abildgaard published his observations in 1799 and appended some remarks and reflexions about the occurrence of animal fossils in nature. He put the question — unanswered — why as a rule fossils of marine animals are found in mountains and deeply underground, while fossilized land animals are most often found in the lowlands and near the surface. When Abildgaard published his observations he was apparently ignorant of the fact that the Parisian professor in zoology, *Georges Leopold de Cuvier*, probably rightly named the founder of Paleontology, had already described the same relic in detail under the name of *Megatherium*.

GEOLOGIST AND CHEMIST

In view of Abildgaard's upbringing and early training it is little wonder that throughout his life he took a great interest in mineralogy and, in association with this, also in chemistry. Both his first and some of his last works are to be found within just this field. Although he had remarked that "*It may appear highly presumptuous trying to discover how things originated on this Earth of which we at most, and very incompletely, can only look into the superficial parts of its crust. However, the scrutiny gratifies, even when we most clearly and convincingly feel the impenetrable limits for our inquisitiveness*". His work demonstrated, however, that the "gratification of scrutinizing" had succeeded in pushing the feeling of presumption far to the back of his mind.

In 1762 Abildgaard published a dissertation for his bachelor's degree, which as mentioned before, was on a chemical subject, *A chemical reflexion on the usefulness of chemistry in the public economy.* The treatise, which comprised approximately twenty pages in Latin, was only reporting and did not contain any original thinking of his own, but all the same, the many references to foreign chemists show clearly that he kept abreast of what was going on in the field of natural history elsewhere in Europe.

During the following fifteen years it became his duty to shoulder a heavy work-load in other spheres which, combined with a very strained economy, caused his mineralogical studies to be limited to minor investigations, particularly about the conditions of Danish soil, and only after 1777 could he begin to bring out the results of these investigations to a wider forum, namely at meetings of the Society of Sciences and Letters, and later published in the proceedings of the society. At first he described a series of experiments on the formation of hydroflouride acid by treating flusspat with sulphuric acid and after this in 1781 and 1783 he reported a series of experiments with treatment of quartz sand with sulphuric acid. Particularly in this last paper he renders a careful account of the

views of that time about the soil of which three main types were believed to exist, viz. lime-soil, silica-soil and clay. Of these, clay was still the obscure entity, and a good many investigators were working on it, thus P. C. Abildgaard's father, Søren Abildgaaard was awarded a prize by the Royal Danish Society for Agricultural Economy, for a treatise on clay.

P. C. Abildgaard examined a series of rocks for the benefit of the Norwegian mines, especially the silver ores from the mines near Kongsberg, but also several not hitherto described minerals were examined by him. Abildgaard did not content himself with laboratory investigations alone, he also travelled to the very places where the rocks were found. It is evident, especially by his letters from these journeys in southern Norway, that he does not subscribe to the current theories that the surface structures of mountains were caused by the Deluge, and although the glacial ages were unknown at that time, Abildgaard tries to content himself with the idea that the various scouring furrows were probably caused by overflows during "untold ages".

In another work he examined the fuel value of coal from Bornholm and the Faroes in relation to English and Scottish coal. When examining some minerals sent to him from Greenland, he especially noticed a few heavy, whitish and semi-transparent stones. He called them Icestones and later the Portugese mineralogist Andrado named them Cryolite. By means of difficult examinations Abildgaard was able to demonstrate two of the elements of cryolite, namely fluorine and "alunearth" (aluminium), but he did not succeed in finding the third constituent element, sodium. While the other Greenlandic stones were described in the proceedings of the Natural History Society in 1792 together with a number of Norwegian minerals, and some stalactite-like chalcedonies, the examination of cryolite was only ready for publication in the proceeding of the Society for Sciences and Letters in 1800. It should be mentioned that in 1795 Abildgaard also gave an account of the recent eruption of the volcano Vesuvius with a description of the ejected lava.

PHYSICIST AND PHYSIOLOGIST

Also within another field of the fundamental sciences, physics, Abildgaard carried out a number of experimental as well as purely theoretical works. Among the latter should be mentioned an ingeniously devised method for investigating whether the magnetic attraction of the earth on iron is the same at the equator as at the poles, or if the force which turns the magnetic needle really is magnetism or simply a manifestation of gravitation. In a textbook in physics for veterinary students, issued as a joint publication by Abildgaard and Viborg in 1800, Abildgaard alone prepared the chapters on Light, Electricity, Magnetism and The Earth, and the lucid presentation of the material in these chapters was a main reason why a chair in Physics was offered him at the University of Copenhagen; however, he had to decline. Among his experiments of the more practical type can be mentioned a series of investigations into the freezing-points of water in relation to its salinity. He undertook these as a member of the Copenhagen Society of Fire-Wardens in order to find out how much salt should be added to the water reservoirs of the Fire Brigade, to avoid the fatal consequences of water freezing in winter-time as was the case in the conflagration at Christiansborg Castle on 26th February, 1794.

Within the sphere of physiology there are a few works by Abildgaard, most of them critical surveys of the works of foreign investigators such on the resorption power of blood vessels, on respiration, on experiments to measure the carbon dioxide content of the blood, and on the influence of electricity upon animals. After becoming acquainted with the statements of the Italian physicist and physiologist *A. Volta* in 1799 concerning the influence of electricity upon musculature of animals by means of which

among other things he could make a frog kick a leg by conducting an electrical current through it, Abildgaard tried as the first (in vain) to start the heart of dead animals by stimulation with electrical current.

This multifarious research work gave Abildgaard the opportunity to establish very rich collections comprising a variety of objects. In order to preserve these for the School and also to assist Abildgaard economically after some unlucky speculations on the stock exchange, the King in 1783—1784 bought most of the collections and donated them to the School. The gift included Abildgaard's collection of books comprising more than 2,000 volumes on veterinary science, medicine, natural history and economy, which became the nucleus of the library of the Veterinary School. Likewise the collections started by Abildgaard became the basis of the School's comprehensive collections of physical, surgical and anatomical instruments, and of anatomical and zoological preparations.

These collections were unique among European veterinary schools at that time and contributed much to the high esteem of the Danish school.

Abildgaard's mineralogical collection deserves special notice. It was started already in his boyhood under the guidance of his father, and it soon expanded in size and improved in quality, holding many rare specimens. As Prince Christian Frederik was also very interested in mineralogy, a large part of the collection was bought for him, but unfortunately all this was lost when Christiansborg Castle burnt down in 1794. A part of the remaining collection was included in the collections of the Veterinary School which in this respect became better furnished than corresponding institutes elsewhere. The rest remained private property and was later sold by Abildgaard's estate for inclusion in the collections of the National Museum. Later, it was transferred to the University Museum of Mineralogy where the specimens are arranged according to their proper divisions in the system. Consequently, the collection does not exist as an entity any more.

ABILDGAARD AS A PERSON

Based upon his own, as well as on contemporary scientists' publications it is easy enough to form a picture of Abildgaard as a scientist and teacher. It is more difficult to obtain a quite unbiased all-round impression of him. It has to be supported by contemporary private correspondance, and by obituaries written at his death (probably painting a somewhat glorified picture of the deceased).

It seems certain, however, that Abildgaard was for this period of average stature, rather slim and already in his youth with a sparse head of hair. As early as in his middle manhood he was taken severely ill, and from then on he was the victim of constant infirmity. He died suddenly in the evening of 21st January 1801. According to his own description he suffered from persistent insomnia, giddiness and perceptible loss of memory. Abildgaard was advised a good many remedies for his ailments. Thus Professor *Wolstein* from the Veterinary School in Vienna recommended him to use an "*Eiterband*" (lit. "pus-string" made of a twine of hair) through the skin at the back of his neck, if the cause of giddiness was located in the head. The "pus-string" would draw festering in a couple of months. There is no evidence as to whether Abildgaard took the advice.

J. V. Neergaard, Abildgaard's assistent teacher, writes about his first meeting with Abildgaard that he met a small, very handsome, old man with snow white hair, save for a bald patch on the crown of his head. His pale, wrinkled face was grave but gentle, with an expression of high intelligence, thoughtfulness and cordiality. This "old man's portrait" of Abildgaard, then 55 years of age, must be regarded in relation to the then average lifespan of less than 35 years for the population of Copenhagen.

J. V. Neergaard.

In mediaeval Denmark a family of the nobility bore the name Abildgaard. First heard of in 1230, members of this family held high office during the next century and divided into several lines. They appear to have fallen in disgrace under Queen *Margrethe* I (1353—1412) and gradually died out or disappeared among the peasantry. This noble family carried a coat-of-arms with three apples, almost identical with the figures in P. C. Abildgaard's signet; this and the name have given rise to guesses about kinship with the noble family, but there is no proof, for any family named Abildgaard it comes rather naturally to use apples in a coat-of-arms or on a signet. Abildgaard is an archaic — now almost forgotten — Danish word meaning apple tree, thus "Abildgaard" is much the same as "Orchard".

However Viborg, who was well aware that the family lineage mentioned above was probably fictitious, writes that Abildgaard had sprung from stock which could give him the best natural talents. From his mother, *Ane Margrethe Bastholm* from Jerslev

in Vendsyssel he inherited both wisdom and lenience, and from his father, *Søren Abildgaard* from Flekkefjord in Norway, a bright intellect, a noble and kind heart, and inclination both for natural science and for the art of drawing. Also in bodily stature he is said to have been like his father, although his bodily frame already from his childhood was weakened, both because of his growing up in a large city (75,000 inhabitants) and arduous work all through childhood and youth.

Nature had bestowed many excellent qualities upon Abildgaard. As mentioned he was extremely industrious and ready to help, and for this reason he began very early to work for reputed scientists in the fields of medicine and natural history. He was also vivacious and ironically quick-witted. This became particularly apparent in the period immediately after the introduction of the freedom of the press in 1770, when a good many persons enjoyed themselves in print with a great number of writings and polemics, not all of them of very high quality to put it mildly. Thus, Professor *Gamborg* proposed to import canaries and let them loose in our forests to teach the native singing birds a more modulated way of singing. Many of these writings were utter nonsense and prudently enough published under pseudonyms. Abildgaard's part in these writings mostly appeared as controversial replies to some of the most foolish of these effusions. He likewise used pseudonyms as *Rosentorne* (Rosethorn) and *Andreas Naalemager* (Andrew Needlemaker). As Abildgaard grew older his temperament became more placid, perhaps because of his failing health. Yet his temper could be roused if his professional honour were slighted such as in the controversy between him and the surgeon and historian N. O. Riegel. Abildgaard put an end to this polemic by publishing the pamphlet: *Addimentum XII ad commentationem historicam de fatis faustis et infaustis chirurgiae* ... — Apart from these attacks by Riegel it is hard to find any disparaging observations about Abildgaard; all the same there is one, and from a rather unexpected quarter. In Raillet's work: *Histoire de l'Ecole d'Alfort*, Claude Bourgelat is quoted for the following statement

about Abildgaard: "False of heart, hated by his fellow-countrymen, intelligent, he has established a school without having much ability for it". This harsh judgement on Abildgaard must be regarded with every possible reservation, precisely because it comes from Bourgelat, who was notorious for not being able to tolerate gifted and well-trained pupils at his own veterinary school. He was a pedagogue about whom not one of the foreign students who visited Lyons and Alfort had a word of praise. A letter from a Swedish student, *Falander*, one of the pupils sent to Lyons from Sweden on the same mission as Abildgaard, is representative. He writes: "Concerning the Veterinary Profession, I would find it quite amusing if the teaching were practised in such a manner that some could make use of it, but the teachers are in the same style as donkeys playing the flageolet. Having copied exercise books which, like crayfish, consist more of shell than of meat, you can imagine how much use that is. We have already been here for two years without having seen any horned cattle and still less any of their diseases. How can one then be able to cure them?".

On 12th July 1768 Abildgaard married the two-year older *Kirstine Jagenreuter*, who outlived him, and died at the age of 87 in 1825. Judging from Abildgaard's letters to his wife, the marriage was very harmonious and two daughters were born and raised in the home. One of them was married to a civil servant, the other to Lieutenant-Commander Oxholm. A daughter of this marriage, *Margrethe Oxholm*, married the well-known lawyer and author *Jens Kragh Høst*, and a son of theirs was christened in the presence of his Great-Grandmother and named, after his famous Great-Grandfather, *Peter Christian Abildgaard Høst*.

If one would ask which of Abildgaard's many excellent qualities decided that it was him who established and organized the Danish Veterinary School, the answer must be that strictly speaking it was none of those mentioned above. The most important quality here was his almost fanatic devotion and absolute loyality to his king and his native country. Only these characteristics could induce a man to take upon himself such a load of work, to tolerate the

humiliations and the privations, both economic and personal, which leadership of the Veterinary School involved in the first years. The coincidence that these good qualities in Abildgaard added to his other qualities, not least ingeniousness, clearsightedness, impartiality and scientific inquisitiveness were the reasons why the School from the very beginning became known and reputed, not only in Denmark but just as much all over Europe.

Seal of the Royal Veterinary School.

THE CATALOGUE OF P. C. ABILDGAARD'S LIBRARY

In the library of the Veterinary and Agricultural University in Copenhagen, there is a catalogue of P. C. Abildgaard's private library, listing the books which were acquired by the state in 1783. The collection tells us nowadays what books were needed by a medical student, and later, by a doctor of the time for medical studies and general practice, as well as what veterinary books Abildgaard possessed in 1783, ten years after the opening of the Veterinary School in Copenhagen.

The full title of the catalogue is *Catalogus over den Samling af Bøger som herved overleveres til Veterinær-Skolen underdanigst af P. C. Abildgaard* (Catalogue of the collection of books hereby most humbly handed over to the Veterinary School by P. C. Abildgaard), and it comprises the following groups:

1. *Veterinaria.*
2. *Historica naturalia, physica et oeconomica.*
3. *Medica.*
4. *Collectanea.*

Of the 1,365 works (2,156 volumes in all) about one-tenth is listed under *Veterinaria* (183 works comprising 229 volumes). Most of the publications are in German, thirty-eight are in French, five in Latin, five in Italian, three in English, and three in Swedish. There are fifteen books in all in Danish.

The impression is conveyed that the books have been listed from the bookshelves. An effort seems to have been made to keep books on the same subjects together, for example, veterinary books on anatomy , general care and characteristics, feeding, equine

diseases, bovine diseases, parasitic diseases, pharmacology, therapeutics, and others.

The medical section is correspondingly arranged, although here the number of books is greater and enables a more detailed subdivision (for example, obstetrics, eye diseases, venerea, etc.).

For practical reasons (and to optimise shelving space) books of the same size are grouped together (quarto, folio, octavo). The catalogue is handwritten but not by Abildgaard personally. Possibly one of his staff has prepared the ninety-three page list.

The catalogue measures 32 cm x 20.5 cm. It is written in ink on fairly coarse, thick paper, bearing the watermark of J. Honing. Its binding is of the usual contemporary materials for bookbinding. The catalogue seems not to have been for everyday use, but sooner an inventory prepared for the sale of the collection. On the last page there is the date on which the catalogue was completed (22nd October 1783), and a short note of transfer written by Abildgaard, with his signature and seal (three apples).

The seal of P. C. Abildgaard.

Overleaf: A page from
Abildgaard's Catalogue.

In Quarto.

1° Veterinaria

61–62. — Gesneri Scriptores rei rusticæ veteris latini cum Vegetii Mulo-Medicina. Editio 2da Tom I–II. Lipsia. 1773–74.

63. — Le parfait Marechal, qui enseigne à connoitre la beauté, la bonté et les defauts des chevaux nouvelle edition augmenté d'un abregé de l'art de monter à cheval par Solleysel. Paris. 1754.

64. — Garsault le parfait Marechal avec un dictionaire des termes de Cavalerie. Paris. 1755.

65. — Laforse Guide du Marechal avec des figures Paris. 1766.

66–67. — Prizelii Vollständige Pferde Wissenschaft. Vol. I–II. Leipzig 1777.

68. — Palmieri perfete Regole et modi di cavalcare. Venetia. 1625.

69. — Reizenstein der vollkommene Pferdekenner. Uffenheim. 1764.

70. — de Wallhausen art de Chevalerie. Frankfurt. 1616.

71. — Behambs vermehrt und verbessertes Roß-Tauscher-Recht; Roß-aufleiher- und Fuhrmanns recht. vermehrt von Salander. Ulmæ 1735.

THE COLLECTIONS

The Horse

Great importance was attached to the study of the general characteristics of the horse because of its relevance to the breeding and selection of horses for military and civilian purposes. Textbooks in German, French, and Italian were used, as well as quite a number of popular books in Danish, written by officers, non-commissioned officers, blacksmiths, grooms and coachmen. In this context, books on horsemanship should also be mentioned, for example:

J. J. Wallhausen: Art de chevalerie. Frankfurt 1616.
L. Palmieri: Perfete regole et modi di cavalcare. Venice 1625.
J. B. V. Sind: Die Kunst Pferde zu zäumen u. zu beschlagen. Frankfurt and Leipzig 1771.
Xenophon: Von der Reiterkunst. Frankfurt and Leipzig 1743.

Anatomy has been marked by the fact that the most important domestic animal was the horse. Among the early works on anatomy can be mentioned:

C. Ruini: Anatomia del cavallo . . . Venice 1618.
S. Paulli: Anatomische u. medicinische Bedencken üb. ein königliches ReitPferd . . . Copenhagen 1672.

Among Abildgaard's contemporaries we find, for example:

C. Bourgelat: Zootomie I—III. Paris 1766—1768.
G. Stubbs: The Anatomy of the horse . . . London 1766.

The early knowledge concerning the *medical treatment* of sick horses is collected in:

Opera della medicina de cavalli, composta da diversi antichi scrittori et . . . di Greco in buona lingva volgare ridotta. Venice

1543. This is also one of the oldest books in the Abildgaard collection. It is also interesting to know that five years later, in 1548, a second edition was published, possibly because it had been translated from the Greek "*in buona lingva volgare . . .*". In this category there is also:

P. Vegetius: Mulomedicina . . . Basel 1574.

P. Esbach: Dend vel indrettede og proberede Heste-Cuur eller Læge-Bog. Copenhagen 1727, as well as a later, much improved edition, Copenhagen 1763.

Lafosse: Guide de maréchal . . . Paris 1766, is also represented.

The Diseases of Cattle

The cattle-plague was the direct cause of Abildgaard's period of study in Lyons. Numerous books on cattle-plague were published at that period in a number of languages including Danish. Most dealt with the pathology of the disease, its geographical extent, economic consequences, and the prophylactic experience of different countries, but they offered no effective measures against the disease or the means of stamping it out. In the collection on this subject are for example:

Istoria dell'epidemia dei buoi. Venice 1712.

E. Sandifort: Beschreibung der Viehseuche in Holland 1769. Leipzig 1772.

U. C. Salchow: Om Hornqvæg Sygen. Odense 1781.

It is also interesting to note that the Danish playwright, *Ludvig Holberg*, has written a paper on the cattle-plague, and that this is also in the Abildgaard collection: Kort Betænkning over den nu regierende Qvæg-Syge med nogle oeconomiske Anmerkninger. Copenhagen 1746. He characterises the misfortune of this disease, and the great financial losses involved by calling the time "the cattle-plague era".

One of the principal features of P. C. Abildgaard's work is his concern with and interest in improving the quality of

livestock. This is emphasized by the name first chosen for the school: *Fæehuusholdning og Lægeskole*, viz. animal husbandry first; in other words, healthy livestock first, the hospital second!

There are a number of publications such as:
Coler: Oeconomia ruralis et domestica. Mainz 1645.
J. C. Bergen: Anleitung für die Landwirthe zur Verbesserung der Viehzucht. Berlin-Stralsund 1781, and a number of books on improved sheep-breeding. *Abildgaard* was himself the co-author (with *E. Viborg*) of a book on the last-mentioned subject, entitled: Veiledning til en forbedret Faareavl og de spanske Faars Behandling i Danmark og Norge. Copenhagen 1800. Abildgaard had visited Spain in 1793, hence his close knowledge of the sheep of that country, which resulted in the book published 1800.

Considering how few were interested in poultry, and knowing how haphazard poultry breeding was, it is indeed surprising to find several papers on poultry, for example:
Buchoz: Ökonomisch-physikalische Abhandlung v. Federvieh. Münster 1777 (translated from the French).

The Natural Sciences

The catalogue lists a considerable number of books on a wide variety of subjects in the field of sciences, e.g. chemistry, physics and meteorology, Abildgaard taught the latter subject. There are also books on botany, horticulture, zoology, mineralogy and mining, as well as a good number of encyclopaedias, dictionaries, and other reference books, for example, *Plinii Secundi:* Historia naturalis.

Abildgaard's interest in chemistry and the uses to which it can be put are demonstrated by his paper: Dissertatio de utilitate chymiae . . ., Copenhagen 1762.

DISSERTATIO

CRITICO-CHYMICA

DE

UTILITATE CHYMIÆ

IN

OECONOMIA REIPUBLICÆ

QVAM

JUBENTE AMPLISSIMO SENATU ACAD.

PUBLICO EXAMINI

SUBMITTIT

PETRUS CHRISTIANUS ABILDGAARD.

DEFENDENTE

PRÆSTANTISSIMO DOMINO

JACOBO EDUARDO COLBIÖRNSEN.

IN

AUDITORIO COLLEGII REGII

Ao. 1762.

IMPRIMATUR,

C. K A L L.

HAVNIÆ, TYPIS MÖLLERIANIS.

Title-page of Abildgaard's first treatise, published in 1762.

Medicine

Among the large number of fine, old medical books, both Danish and foreign, should be mentioned for example:

Galleni: Opera . . ., vols. 1—7. Venice 1586, and
J. Lanzoni: Tractacus de balsamatione cadaverum . . . Geneva 1696.

And books by his colleagues and fellow countrymen include:

N. Steno: De musculis et glandibulis . . . 1664.
Th.Bartholinus: Historiarum anatomicarum rariorum centuria.
J. B. Winsløw: Exposition anatomique de la structure du corps humain. Amsterdam 1754, and of course,
P. C. Abildgaard's own doctoral thesis: De venae sectione in suppressis menstruis. Copenhagen 1768.

Collectanea

This is the smallest category, and it includes both current and concluded series of periodicals. There are in all fifty-three works in quarto and octavo formats. It is difficult to decide which are the most "distinguished".

The group includes:

Acta Physico-medica Academiae curiosorum naturae cum appendice. Norimbergae 1754.
Der Schwedische Academie der Wissenschaften Abhandlungen. Vols. 1—17. 1739—1778. Leipzig 1768—1783.
Kjøbenhavns Videnskabers Selskabsskrifter. Vols. 1—12. Copenhagen 1745—1759.

Finally, this group includes a few library catalogues, directories, and similar items.

The Library's Borrowers

From the information available today it is only possible to gain an approximate impression of the borrowers. The teachers at the

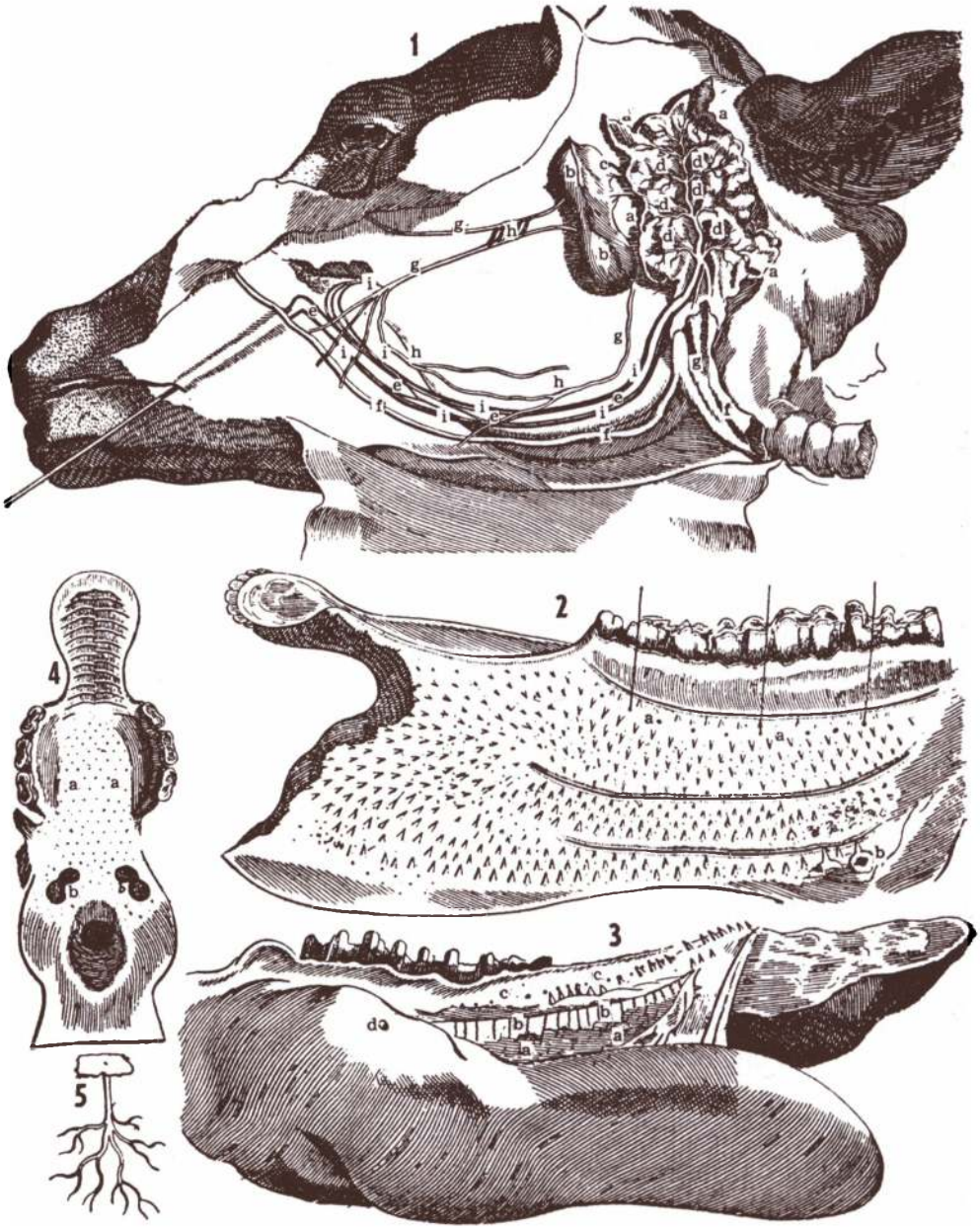


Illustration from N. Steno: De musculis et glandibulis . . ., published in 1664.

Veterinary School were obviously the most frequent users of the library, and no doubt other scholars in Copenhagen occasionally borrowed one of the rare foreign books.

We have more reliable information as far as the students are concerned, because the books they borrowed are in most cases given in the Veterinary School's examination registers now in *Rigsarkivet*, the public record office. Thus, for example, *E. Chr. Kuhn* (exam. vet. 1822) borrowed nineteen titles in all, including the Journal of the Danish Veterinary Society (*Veterinair Selskabets Skrifter)* in three volumes. A particularly large number of books ninety-nine in all) was borrowed by, for example, *J. Schnittger* (exam. vet. 1825).

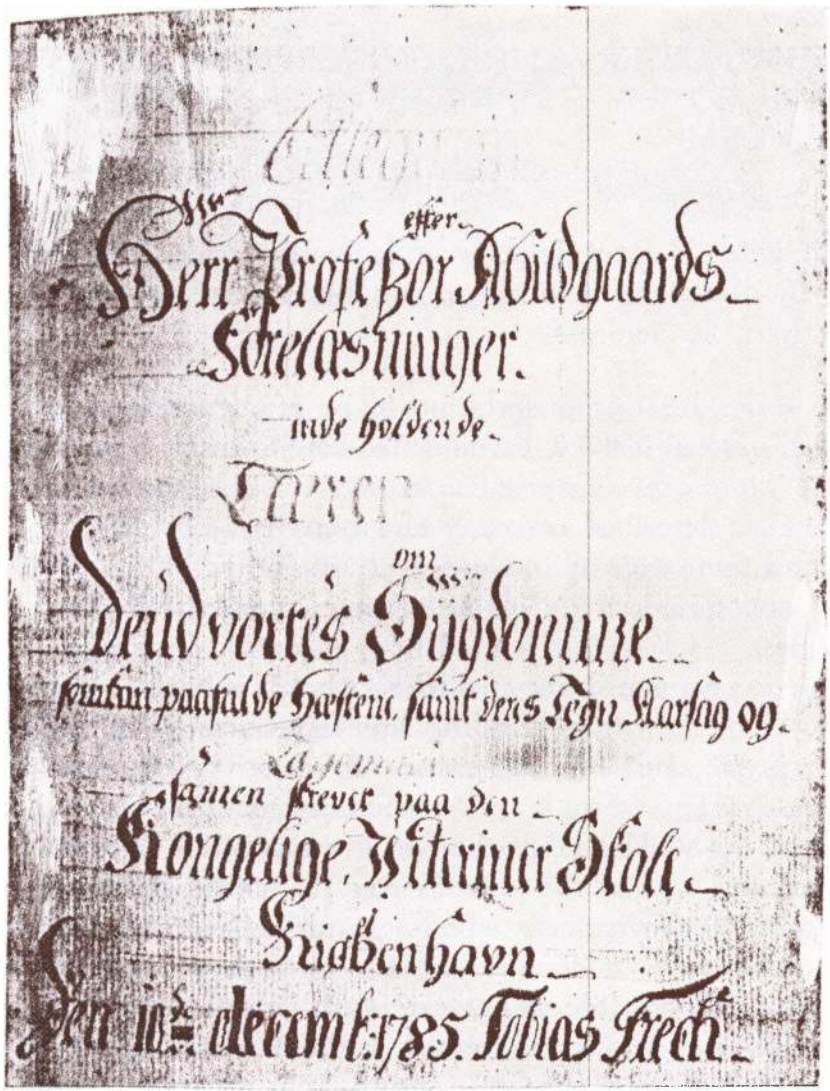
Conclusion

The Abildgaard collection forms the nucleus of the present Veterinary and Agricultural Library in Copenhagen, and it is therefore hardly surprising that the first classification system here was the same as that outlined by Abildgaard. In the course of time the system underwent several modifications, and in 1950 it was replaced by another, more modern system of classification.

It is a pleasure to be able to report that *The Catalogus* is in safe-keeping and accessible, thanks to *Max Lobedanz*, the former chief librarian, who received it as a gift on behalf of the Library, on the occasion of its 150th anniversary, from *Landsarkivet* in 1934. To us the catalogue represents a very valuable and rare record of its time, especially of Abildgaard, the individual, and of the Veterinary School he founded. In this light, then, an appropriate wish for the bicentenary of the Library, would be suitable accommodation where the Abildgaard collection could be exhibited and opened to the public.

Letters to and from P. C. Abildgaard are deposited at *Det kongelige Bibliotek* (The Royal Danish Library), as well as at *Danmarks Veterinær- og Jordbrugsbibliotek* the (Danish Veterinary and Agricultural Library) and at *Rigsarkivet* (The Danish National Archives).

The Danish Veterinary and Agricultural Library
The Royal Veterinary and Agricultural University
Copenhagen.



Besides monographs and periodicals belonging to *P. C. Abildgaard* in the Danish Veterinary and Agricultural Library, there are a few notebooks by his pupils, such as the one above on the external diseases of horses (1785).

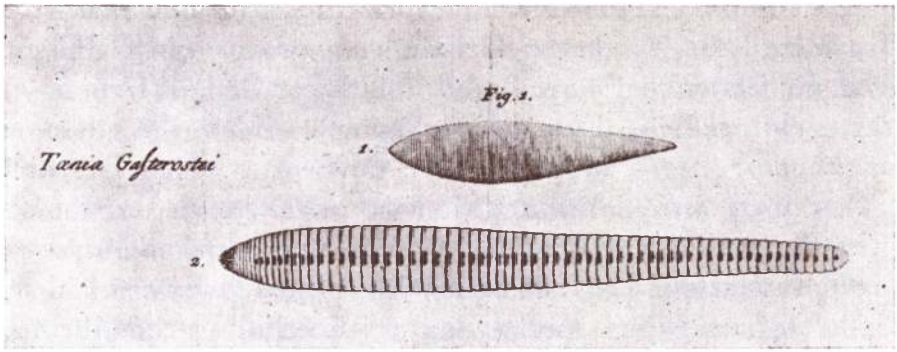
GENERAL OBSERVATIONS CONCERNING INTESTINAL WORMS, COMMENTS ON THE STICKLEBACK'S TAPEWORM

By *P. C. Abildgaard*

(Almindelige Betragtninger over Indvolde-Orme, Bemærkninger ved Hundesteilens Bændelorm, og Beskrivelse med Figurer af nogle nye Bændelorme)

In order for this dissertation to be of greater benefit to the study of natural history, I would like here to insert an observation on the tapeworm (*Taenia gasterostei*) of the stickleback. This worm, first described correctly and completely by Mr. O. Fabricius, and thereafter by our unforgettable O. F. Müller, is located in the abdominal cavity of the afore-mentioned fish, outside the intestines.

It is so common in the stickleback that it is hard to dissect five or six of them without finding this tapeworm. In a single fish there can be one, two, sometimes three, on rare occasions four individuals. The worm is most commonly found in the abdominal cavity of the stickleback if the fish has a swollen belly and when it is not the time of the year for roe to distend its abdomen. In this location, particularly when several individuals are present, the worm may be so compressed, and its body so contracted, that it is almost impossible to observe with the naked eye whether it is composed of segments. Indeed, without a magnifying glass it has to be studied closely in order to find the segmental lines of the body. It is not surprising that Linné and others should not have realized that it was a tapeworm. As Mr. O. Fabricius has observed it only extends and reveals identifiable segments after being in fresh water for some time. It is viable in water for a longer period than any other kind of tapeworm known to me. I



Taenia gasterostei.

have kept several of these worms alive for a period of eight days, in contrast to other tapeworms, even from fish, which only survive for a couple of hours in water. The longer a worm survives in water the more it elongates. Thus, a worm extended by this means may no longer resemble the one originally obtained from the abdomen of the fish. Figure 1 shows the worm as it is when isolated from the stickleback, and Figure 2 shows how it changes after living for three days in fresh water. First at this stage is it possible to study its morphology.

An opening or hole for the outlet of eggs can be observed on the side of the body, and on the middle of each segment; on each side of the hole can be seen a nodule which is identical with the ovary. The head, which on lanceolate tapeworms is located at the slender end of the body, is here found at the broad end. It is, however, difficult to observe the outline and morphology of this tapeworm even with a good magnifying glass. When examining the heads of many living, dead or dried worms, I have noticed that the head is cone-shaped and composed of four minor egg-like lobes, two on each side of the body. The lobes are hollow in the middle and between them is a minor longitudinal elevation or line. The remainder of the worm's body has been so completely described by the two above-mentioned authors that a closer description is not called for in the present paper.

I have often come across a tapeworm in sea-birds which is virtually identical with the stickleback's tapeworm when fully extended. In particular, I have found it in the guillemot (*Uria aalge*), in the great northern diver (*Gavia immer*), and in the goosander (*Mergur merganser*). Moreover, the tapeworm which Dr. Bloch has described and delineated in his prize paper on Internal Worms (S. 10, T. I F. 9), and designated *Taenia lanceolata nodosa*, is of the same type. I do not believe that these tapeworms in sea-birds are of a distinct species despite the finding that they are both longer and larger than those of the stickleback after having lived in water for some time. Nor do I think that their original and proper habitat is in these birds, but that rather — together with the stickleback — they have been devoured by these birds. It seems strange that although I have not detected scraps of sticklebacks in the stomach and intestine of these sea-birds (probably because they were long since digested), these worms were found to be quite viable and more motile than the worms obtained from the stickleback. They were darker in colour, not as completely white as those in the stickleback. Many tapeworms in these sea-birds were either located in the rectum or close to it, as opposed to the common localization of tapeworms in the part of the intestine closest to the stomach. From this evidence, and from the fact that they bear a complete resemblance to the tapeworm of the stickleback, I assume that since it seems impossible for these worms, when within the abdomen of the stickleback, to stretch out and develop their segments, and consequently to mature and expel their eggs, Nature has ensured the survival and reproduction of the tapeworm by allowing it to migrate through the intestines of these birds, and possibly of other animals. The tapeworms would thereby expel and disseminate their eggs in water, and some of the many millions of eggs would then pass into the fish when taken up with the water. In size the eggs of the tapeworm are less than one-fifth of the size of the blood corpuscles of warm-blooded animals, and they pass through the absorbing channels of the stickleback to the blood vessels, from where they are trans-

ported to the abdomen, which provides a convenient hatching site. Although I have examined hundreds of sticklebacks, I have not been able to find any tapeworm-like organisms, but I have found trematodes, nematodes (*Cucullus elegans*), and acanthocephalan worms.

However, in order to gain more proof about the correctness or incorrectness of the assumption that the tapeworm migrates from the abdomen of a cold-blooded fish to the intestines of warm-blooded birds, I collected a large number of sticklebacks which I fed to two domestic ducks over a three-day period. After another three days I dissected both ducks and in the intestine of one of them I found sixty-three specimens of the fish tapeworm, all alive and more active and healthy than those obtained from the stickleback's abdomen. They were fully extended and exhibited the same morphology as those in the sea-birds described above. Yet in the other duck I found only a single tapeworm. It was alive but not as motile as those of the first duck, and both ducks had eaten voraciously of the fish. The intestines of the latter duck were narrower and had less mucus than those of the first duck. It seems strange, though, that despite the comprehensive examinations of the intestines of domestic ducks, Goeze and others have not noticed this worm. It is easily distinguishable from another lanceolate tapeworm in the domestic duck, since the head of the latter type is located in the slender end, and notably different to that of the stickleback tapeworm. Domestic ducks with free access to shore-sides will, like wild sea-birds, eat the stickleback, and if so the worm may be found in them. From the present experiment several conclusions may be drawn, and they must encourage other experiments of this type. Therefore it seems reasonable to omit further conclusions and considerations until I myself or others have had the opportunity to perform similar experiments.

Paper printed in *Skrivter af Naturhistorie-Selskabet* 1790, *I: 1*, 26–64.

CATALOGUE OF PETER CHRISTIAN ABILDGAARD'S MOST IMPORTANT TREATISES[1] AND MISCELLANEOUS WRITINGS

Abbreviations:

1. Act. Reg. Soc. Med. – Acta Regiæ Societas Medicæ.
2. Act. Soc. Med. – Acta Societas Medicæ.
3. Col. Soc. Med. – Collectanea Societas Medicæ.
4. Phys. Oec. og Med.-Chir. Bibl. – Physicalsk Oeconomisk og Medico-Chirurgisk Bibliothek.
5. Schr. d. Berl. Ges. naturf. Fr. – Schriften der Berliner Gesellschaft naturforschender Freunde.
6. Skr. af Natur-Selsk. – Skrivter af Naturhistorie-Selskabet.
7. Vid. Selsk. Skr. – Videnskabernes Selskabs Skrifter.

1762. Dissertatio critico-chymica de utilitate chymiæ in oeconomia reipublicae. Havniæ 1762, 23 pp.

1768. Dissertatio inauguralis medica de venæ sectione in suppressis menstruis. Havniæ 1768, 30 pp.

1769. (N. R. v. Rosenstein), Underretning om Børne-Sygdomme og deres Heldbredelse, af Svendsk oversat og med Anmærkninger forklaret. Kiøbenhavn 1769, 507 pp. + Reg.
Children's diseases and their cure. Translated into Danish from Swedish, and with annotations explained.

1770. En Dansk Heste- og Qvæg-Læge, i et lidet Udtog, hvorudi findes tydelig beskreven de Sygdomme, som anfalder Heste, Hornqvæg, Faar og Sviin, samt hvorledes man uden kostbare Midler kan helbrede dem. Efter Kongl. allernaadigst Befaling forfærdiget til Bøndernes Brug og Nytte.Kiøbenhavn 1770, 82 pp.
A Danish veterinary handbook on the treatment of diseases in horses and cattle, abridged. And economical medicines for cures.

Afhandling om Diæten eller Underretning hvorledes man skal bevare sin Helbred ved et ret Brug og Valg af de Ting, som ere nødvendige til Livet. Oversat af det Svenske til almindelig Nytte samt forsynet med nogle Anmærkninger af P. C. Abildgaard, D.M. Kiøbenhavn 1770, 594 pp. + Register.
A paper on diet or an account of how to keep healthy through a correct use and choice of the things necessary for staying alive. Translated into Danish from Swedish, with additional annotations.

[1] The principal source being *Ehrencron-Müller's Forfatterlexicon.*

1771. Unterricht von Pferden, Kühen, Schaafen und Schweinen, wie man dieselben warten und aufziehen muss; in gleichen von ihren Krankheiten und von den Arzeneyen und Heilmitteln. 1ster Theil. Auf Kgl. allergn. Befehl herausgegeben. Kopenhagen und Leipzig 1771, 256 pp.

Et velmeent Brev og Erindring til alle de Østersers, Hummeres, Krabbers, Torskers, Barders, Helleflynders, Skrubbers, Hornfiskers, Skallers, Sandskrubbers, Anciovesers, Negenogernes og Ulkers Sielesørger, Skribent, Lærere og Oldefader Junior Philopatreias paa de Arkadiske, Hetlandiske, Skotlandiske, Ferrøiske og Canariske Eilandes Vegne skrevet paa den almindelige Fornufts Vegne af Rosentorne. Kiøbenhavn 1771. (Pseudonym.)

A well-intentioned letter and reminder to the spiritual adviser, writer, teacher and great-grandfather of all oysters, lobsters, crabs, codfishes, baleen whales, halibut, flounders, garfishes, roaches, anchovies, lampreys, and sea scorpions, namely Junior Philopatreias, on behalf of the Orkney, Shetland, Hebridean, Faeroe and Canary Islands, written in the cause of common sound sense by Rosentorne. (Pseudonym).

En sandfærdig og tilforladelig Beretning om Junior Philopatreias Død og paafulgte Begravelse. Samt en fuldstændig Beskrivelse over hans Parade-Seng, og en Samling af Vers og Gravskrifter, som i adskillige Sprog ere forfærdigede. Tilligemed en Liig-Tale, som blev holdt ved hans Begravelse af Mag. Klerkerup. Efter den Sal. Afdødes Begiering til Trykken befordret af Rosentorne. Kollekolle 1771. (Pseudonym.)

A true and trustworthy account of the death of Junior Philopatreias and of his burial, as well as a complete description of his lit-de-parade, and a collection of verses and epitaphs penned in many languages. Also the funeral oration held by Magister Klerkerup. According to the wishes of the late departed this has been arranged for publication by Rosentorne. (Pseudonym).

1772. Brev til Statsmanden Herr Josias Leopold Bynch fra Rosentorne. Kiøbenhavn 1772. (Pseudonym.)

Letter to the Statesman Herr Josias Leopold Bynch from Rosentorne. (Pseudonym).

1774. De eximia salis Tartari efficacia in Rachitide. — *Col. Soc. Med. I*, 1—6. De vomitu sympathetico a ligata sarcomate in fronte. *Ibid.* 176—178. Observatio de lethali radicis Jalappæ effectu in duobus subjectis a morbo inflammatorio intestinorum convalescentibus. *Ibid.* 234—237.

1775. Tale holden i det Kgl. Danske Landhuusholdnings Selskabs høitidelige Forsamling den 31. Jan. 1775, i Anledning af Hs. Maj. Kongens Fødselsdag og Selskabets Stiftelsesdag, da Hs. Kgl. Hhd. Kronprinds Frederik som Selskabets høie Patron behagede første Gang at bivaane dets Forsamling. Kiøbenhavn.

Speech given at the Royal Danish Agricutural Society's ceremonial assembly on the 31st January 1775, on the occasion of His Majesty's birthday and the date of the Society's foundation, graciously attended by His Royal Highness, the Crown Prince Frederik, as the honorable patron of the Society, and the first occasion upon which he graced the assembly with his presence.

Tentamina electrica in animalibus instituta particula I. *Col. Soc. Med. II*, 157—161. — Alcali volatilis usus externus. *Ibid.* 265—269.

1777. Tale holden i det Kgl. Danske Landhuusholdnings Selskabs høitidelige Forsamling d. 31. Januar 1777 for Præmiers Uddeling, da Selskabets Høie Patron, Hs. Kgl. Hhd. Kronprinds Frederik 3die Gang behagede at bivaane dets Forsamling. Kiøbenhavn.

Speech given at the Royal Danish Agricultural Society's ceremonial assembly on the 31th January 1777 for the awarding of prizes, in the most gracious presence of the Society's patron, His Highness, Crown Prince Frederik, upon the occasion of his third attendance at the assembly.

Historia hydropis lethalis a causa rarissima. *Act. Soc. Med. I* 225—244.

1778. Tale (i samme Anledning som $^{31}/_{1}$ 1777) 16. Februar 1778. Kiøbenhavn.

Speech (given on a similar occasion to that of 31/1 1777) 16th February 1778.

Satiriske mindre Opsatser under Mærke: „Andreas Naalemager". *Alm. dansk Bibliotek.*

Satirical essays under the pseudonym of "Andreas Needlemaker".

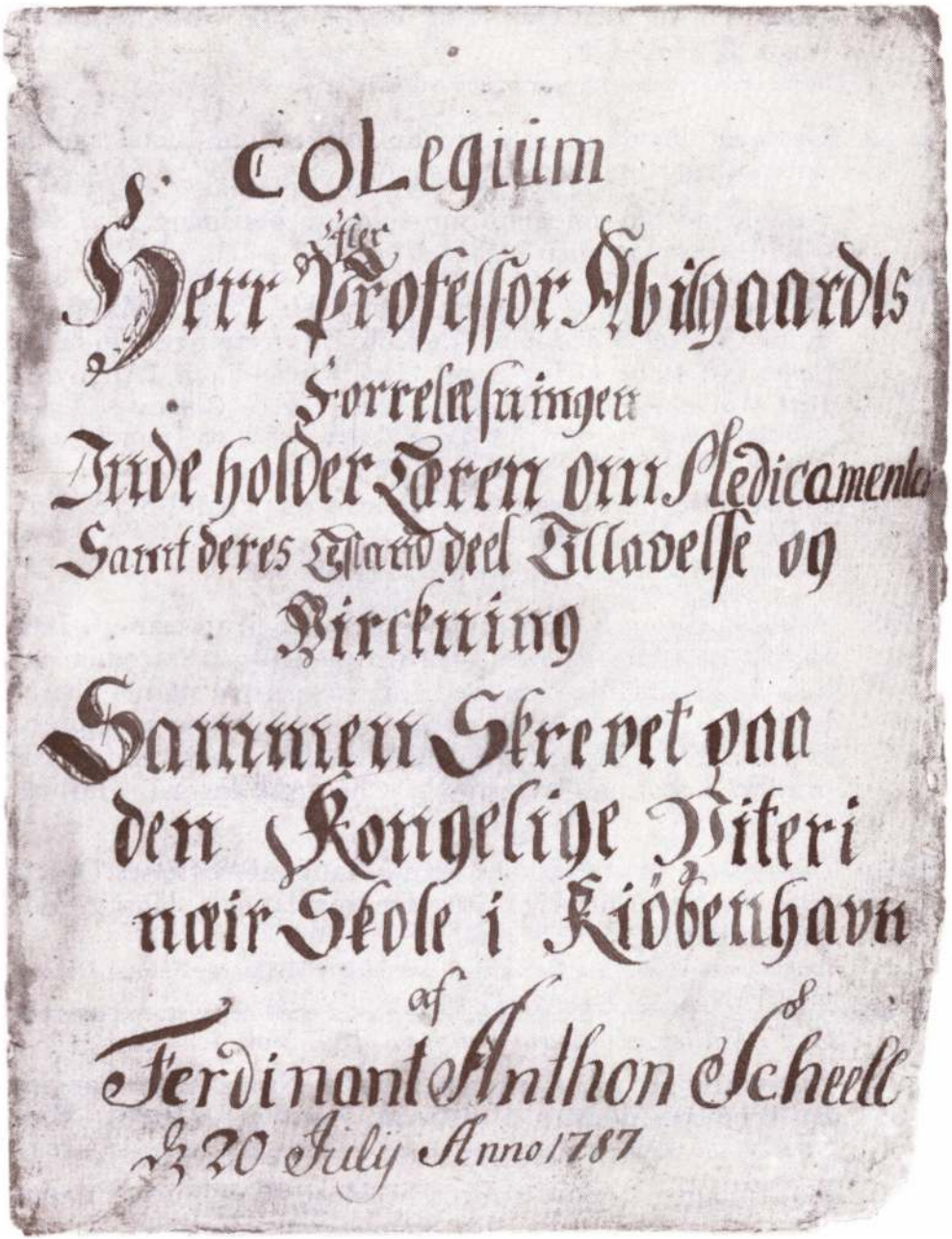
1779. De febris tertianæ singulari symptomate observatio. *Act. Soc. Med. II*, 273—276.

Om den grasserende Qvægsyge og dens Indpodning. *Adresseavisen* Nr. 93, 113, 128, 132, 156, 168, 170, 171.

On the rampant cattle plague and its inoculation.

Nogle Forsøg med Flusspat og Flusspat-Syre. *Vid. Selsk. Skr. XII.* 285—290.

Some experiments with flusspat and hydrofluorid acid.



A notebook on pharmacology in the Danish Veterinary and Agricultural Library, by one of *P. C. Abildgaard's* pupils (1787).

1781. Nogle Forsøg med Qvartz og Vitriol-Syre. *Vid. Selsk. Skr. Ny S. I.* 275—278.
Some experiments with quartz and vitriolic acid.

1783. Observatiuncula de infanticidio suffocatione foetus subitanae post partum peracto. *Act. Reg. Soc. Med. I* 341—344.

Aliquid ad physiologiam musculorum pertinens. *Ibid.* 470—476. Casus medico legalis. *Ibid.* 477—480.

1785. De Hrr. Martini og Riegelsens imod Hr. Prof. Callisen udgivne Charteker bedømte i de Kbh. Efterretninger om lærde Sager Nr. 40 og 41 for Aaret 1785. Kiøbenhavn. (Anonym.)
Herr Martini and Herr Riegelsen against Professor Callisen concerning published papers reviewed in the Copenhagen Annals on Learned Works, Nos. 40 and 41 for the year 1785. (Anonymous).

Fortsettelse af Forsøg med Qvartz og Vitriol-Syre. *Vid. Selsk. Skr. Ny S. II.* 312—318.
Continued experiments with quartz and vitriolic acid.

1788. Additamentum XII ad commentationem historicam de fatis faustis et infaustis chirurgiæ, nec non ipsius interdum indissolubili amicitia cum medicina cæterisqve studiis liberalioribus ab ipsius origine ad nostra usque tempora, impress. Hafniæ 1787, sive Regii Instituti Veterinarii Hafniensis brevem historiam scripsit Pt. Chr. Abildgaard. Hafniæ. 1788.

1789. *Indbydelse* til et Selskabs og en National Stiftelses Opprettelse for Naturhistorien, især Fædrenelandets. Heri Abildgaards Forslag af $^{10}/_{9}$ 1789.
Invitation to establish a National Royal Society of Danish Natural History. Including P. C. Abildgaard's Proposal of 10/9 1789.

O. F. Müller. Zoologia Danica. 1789, Vol. 3.

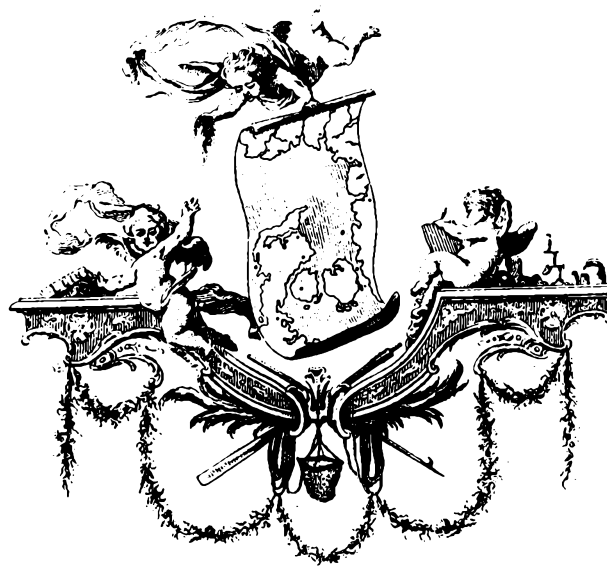
Bemærkninger om Aarsagen, hvorfor Næsen altid mangler hos eenøiede Monstra. *Vid. Selsk. Skr. Ny S. III* 331—338.
Notes on the reason why the nose of one-eyed monsters is always missing.

Beschreibung 1. einer grossen Seeblase (Holothuria Priapus Linn.) 2. zween Arten des Steinbohrers (Terebella Linn.) 3. einer grossen Sandröhre (Sabella Linn.). *Schr. d. Berl. Ges. naturf. Fr. IX.* 133—146, 353—354.

DESCRIPSIT ET TABVLAS ADDIDIT

PETRVS CHRISTIANVS ABILDGAARD,

MED. DOCT. ARTIS VETER. PROFESSOR ET INSTITVTI REG. VETER. HAVN. RECTOR SOC. REG. SCIENT. HAVN. NORVEG. MEDICOR. HAVN. NAT. CVR. BERLIN. PHYSIOGRAPH. LVNDENS. MEMBRVM.



O MARE, O LITTVS, verum secretumque Θαλάσσιον!

HAVNIAE,

TYPIS AVLAE REGIAE TYPOGRAPHI N. MÖLLERI ET FILII.

MDCCLXXXIX.

From *O. F. Müller*, Zoologia Danica. Copenhagen 1789, Vol 3. Title-page (lower part).

1790. Underretning for Landmanden om den nu herskende Lever-Syge hos Faarene. Kiøbenhavn d. 15de Februar. 1790. (Uden Titelblad.)

Report for farmers on the present widespread incidence among sheep of fascioliasis. Title page absent.

Almindelige Betragtninger over Indvolde-Orme, Bemærkninger ved Hundesteilens Bændelorm, og Beskrivelse med Figurer af nogle nye Bændelorme. *Skr. af Natur-Selsk. I*, 1. H. 26—64.

General observations concerning intestinal worms, comments on the stickleback's tapeworm.

Kurze anatomische Beschreibung des Säugers (Muxine glutinosa Linn.) *Schr. d. Berl. Ges. naturf. Fr. X.* 193—200.

1791. Nogle Anmærkninger i Anledning af Troyels Beretning om Svampe, som findes undertiden paa Soelsikken og dens Lighed med adskillige Planters især Rugens Misfostere, Moderkorn eller Meeldrøier kaldede, samt Brand hos Planterne m. v. *Skr. af Natur-Selsk. I.* 2. H. 52—61.

Some remarks in connection with Troyel's paper on fungus sometimes found on the sunflower, and its resemblance to that on many plants, particularly white mould on rye, called ergot of rye, and smut on plants of other kinds.

Nyere Efterretninger om det Skaldyr fra Middelhavet, som Forskaal har beskrevet under Navn af Anomia tridentata. *Ibid.* 171—175.

Recent information about the Mediterranean shellfish described by Forskaal under the name of Anomia tridentata.

1792. Om drypsteensformige Calcedoner og om nogle nye ubeskrevne norske og grønlandske Steenarter. *Skr. af Natur-Selsk. II.* 1. H. 107—132.

On stalactiform Chalcedonies, and on some new, hitherto undescribed Norwegian and Greenlandic varieties of rock.

1793. Raad imod de almindeligste Sygdomme hos de vigtigste Huusdyr, til Brug for Bondealmuen. Efter det Kgl. Danske Cancellis Befaling forfattet. Kiøbenhavn. 1793, 48 pp.

Advice on the treatment of the most common diseases in the most important of livestock, a handbook for farmers, prepared on behalf of the Royal Danish Chancellery.

Fortegnelse over en Deel Mineralier, en Samling af Krebs og Krabber, samt en temmelig stor Samling af Indvolde-Orme og andre til Orme-Klassen henhørende Dyr m. m.,

som Mand. d. 22. Apr. 1793 ved off. Auct. bliver bortsolgt. Kiøbenhavn. 1793. (Anonym.)
Inventory of some minerals, a collection of crayfish and crabs, as well as a fairly large collection of intestinal worms and other classes of worm parasitic in animals, and others. Sold by public Auction. (Anonymous).

Hvorledes man kunde prøve om et Stykke Jern veier mere ved Polerne end under Æquator. *Den physikalske Aarbog. VII*, 164—168.
On how to test whether a piece of iron weighs more at the poles than at the equator.

Nogle Forsøg betræffende Infusions-Dyrenes Oprindelse og Aarsagen til Vandets Forraadnelse. *Skr. af Natur-Selsk. III.* 1. H. 70—87. Beskrivelse og Aftegning af tvende nye Infusions-Dyr, som findes i de Danske Vande. *Ibid.* 88—90.
Some experiments concerning the origin of infusoria and the reason why water stagnates.
Description and drawings of two new infusoria found in Danish waters.

Bemærkninger ved Linnei Sabella Chrysodon og nogle Dyrplanter. *Vid. Selsk. Skr. Ny S. IV*, 29—36.
Comments of Linnei Sabella Chrysolite and some Coelenterates.

Beskrivelse og chemisk Undersøgelse af en Biergart, som findes i tvende Kongsbergske Gruber, under Navn af Sølv-Branderts. *Ibid.* 435—443.
Description and chemical examination of a rock variety found in two Kongsberg mines (*Norway*) under the name of silver ore.

1794. Bemærkninger over tvende Faar med Ringsyge. *Phys. og Oec. Med.-Chir. Bibl. III.* P. 1—4. Fragment af et Par Breve fra Abildgaard om Faareavlen i Spanien til Professor Viborg. *Ibid.* 426—434.
An account of two sheep with staggers.
Fragments of two letters on sheep breeding in Spain from Abildgaard to Professor Viborg.

Beskrivelse af tvende nye Insekter henhørende under den Linneiske Slægt Monoculus, og den Müllerske Slægt Caligus. *Skr. af Natur-Selsk. III.* 2. H. 46—54. — Beskrivelse af en ny Igle, funden paa Giellerne af Støren. *Ibid.* 55—56.

Beskrivelse af en Gielleorm (Lernæa), funden paa Brasens Krop. *Ibid.* 57—58.

Beskrivelse af en ny Snylte-Orm, funden paa Horn-Fiskens Gieller (Axine Bellones). *Ibid.* 59—60. Aftegning af Müllers Plumas-Nerite. *Ibid.* 61—62.

Description of two new insects of the Linnaean classification Monoculus, and the Müller classification Caligus.
Description of a new leech found on the gills of sturgeon.
Description of a Lernaeid found on the roach.
Description of a new parasitic worm found on the gills of garfish (Axine Bellones).
Drawing of Müller's Plumas-Nerite.

Neue Geschlechter der Eingeweidewürmer nebst drey neuen Arten des Bandwurms. *Meyers Magazin f. Thiergeschichte. II.* 108—172.

Eine neue Entdeckung von dem granulirten Blasenbandwurm. *Riem, Neue Samml. vermischter ökonomischer Schriften. VI.* 58—62.

1795. Forsøg med Vægtens Forandring med udrugede Æg. *Phys. Oec. og Med.-Chir. Bibl. V.* 359—360.

Tests on changes in weight of hatched eggs.

Beretning om Hesteavlens Tilstand i Danmark og Fyrstendømmerne og Beretning over de Forsøg til den danske Ulds Forbedring ved fremmede Vædre, som er gjort paa Lynggaarden, Gladsaxe Mark i Aarene 1782—1785. (Hele Oplaget brændte ved Kiøbenhavns Ildebrand). *Statistisk Aarbog* (O. Malling og Fr. Thaarup) H. 1.

An account of the state of horse-breeding in Denmark and the Duchies, and an account of experiments to improve the quality of Danish wool by introducing foreign rams, as done at the farm of Lynggaard, Gladsaxe, west of Copenhagen from 1782 until 1785. (The entire edition was destroyed in the great fire of Copenhagen).

Kort Beretning om det Kgl. Natural-Cabinet i Madrid med Beskrivelse over et gigantisk Skelet af et nyt ubekiendt Dyr, som er opgravet i Peru og bevaret i dette Museum. *Vid. Selsk. Skr. Ny S. V.* 402—414.

A short account of the Royal Natural History Cabinet of Curiosities in Madrid, with a description of the gigantic skeleton of a new, hitherto unknown mammal, dug up in Peru and preserved in this museum.

1796. Efterretning om det sidste Udbrud af Bjerget Vesuv i et Brev fra Will. Hamilton til Joseph Banks, med Anmærkninger af Abildgaard. *Phys. Oec. og Med.-Chir. Bibl. VII.* 15—78.

Report of the latest eruption of Vesuvius recorded in a letter from William Hamilton to Joseph Banks, with annotations by Abildgaard.

Iagttagelser og Forsøg anstillede for at oplyse Ruysch's Liberkühns og andre Physiologers Meening om Blodaare-

nes Indsugnings-Evne. *Phys. Oec. og Med.-Chir. Bibl. VIII.* 28—35.

Observations and experiments undertaken to elucidate Ruysch's, Liberkühn's and other physiologists' opinion on the carbon content in blood.

Bemærkninger over en druknet Hest. *Phys. Oec. og Med.-Chir. Bibl. IX.* 111—112.

Notes on a drowned horse.

1797. Mindetale over Herr Andreas Peter Greve af Bernstorff, holden i Videnskabernes Selskab d. 3. Novbr. 1797. Kiøbenhavn.

Commemorative address in memory of Count Andreas Peter Bernstorff given in the Royal Society of Sciences and Letters on 3rd November 1797.

Udkast til en almindelig Quarantaine-Plan. *Phys. Oec. og Med.-Chir. Bibl. X.* 230—278.

Proposal for a general quarantine scheme.

1798. Om de Perkinske Metalnaale. *Phys. Oec. og Med.-Chir. Bibl. XIII.* 54. Tale holden i Selskabet for druknede Menneskers Redning. *Ibid.* 113—127.

On the Perkin's metal needles. Lecture given at the Society for the Rescue of Drowning Persons.

Analyse af Blæresten ved Fourcroy. *Phys. Oec. og Med.-Chir. Bibl. XIV.* 329—334.

Analysis of bladder stones according to Fourcroy.

1799. Forsøg med Søsalt til at forhindre Vandets Frysning. *Phys. Oec. og Med.-Chir. Bibl. XV.* 171—172. — Abildgaard og Manthey. Chemisk Undersøgelse af de Bornholmske og Færøiske Steenkul med Hensyn til deres Værd i Forhold til de engelske og skotske. *Ibid.* 309—318.

Experiments with sea salt to prevent water from freezing.
Abildgaard and Manthey. Chemical tests of coal from Bornholm and the Faeroes in order to compare their worth compared with English and Scottish coal.

En ny Maade at rense Bruunsteen fra Jern. *Phys. Oec. og Med.-Chir. Bibl. XVI.* 17—18. — Nye Forsøg om Aandedrættet og dets Nytte, med Anmærkninger af Pfaff. *Ibid.* 272—282. — Svar paa Pfaffs Bemærkninger over mine Ytringer og Tvivl betræffende Respirations-Theorien. *Ibid.* 283—288.

Anmærkninger til en dansk Rejsendes Breve fra Madrid. *Ibid.* 338.

A new method of refining pyrolusite from iron.
New experiments concerning respiration and its use, with annotations by Pfaff.
Reply to Pfaff's remarks concerning my pronouncements and doubts about the respiration theory.
Notes on a Danish traveller's letters from Madrid.

1800. Indledning til almindelig Naturkyndighed for Dyrlæger, bestemt til Brug ved Underviisningerne i den Kgl. Danske Dyrlægeskole. Kiøbenhavn 1800, 324 pp. (Sammen med Erik Viborg. Om Lyset, Elektriciteten, Magnetismen og Jordkloden er af Abildgaard.)

Introduction to general natural science for veterinary surgeons intended as part of a textbook for teaching purposes at the Royal Danish Veterinary School. (In collaboration with Erik Viborg). The sections on light, electricity, magnetism and the Earth are by Abildgaard.

Veiledning til en forbedret Faareavl og de spanske Faars Behandling i Danmark og Norge. Kiøbenhavn 1800, 128 pp. (Sammen med Erik Viborg.)

Guide to improved sheep breeding and the care of Spanish sheep in Denmark and Norway. (In collaboration with Erik Viborg).

Anmærkninger ved det bonnetske Forsøg, at Hovedet igien udvoxer paa Snegle, af hvilke man har afskaaret det. *Phys. Oec. og Med.-Chir. Bibl. XVII*, 14—17.

Comments on the Bonnet experiment concerning the regenesis of the head of a snail after the beheading of a snail.

Nogle Forsøg til at bestemme Kulstoffets Mængde i Blodet. *Ibid.* 67—71. — Igientagne Forsøg med Blodet for at bestemme den Mængde Kulstof, det indeholder. *Ibid.* 137—142. — Abildgaard og Viborg, Iagttagelser om Anvendelsen af Byg til Hestefoder istedet for Havre. *Ibid.* 105—117. — Om de chemiske Bestanddele af Arendaliten forhen kaldet Grøn Schørl fra Arendal, angivne af Gmelin og Vauqvelin. *Ibid.* 168—171. — Historisk Udsigt over Selskabet for druknede Menneskers Redning, dets Bestræbelser og Tilstand. *Ibid.* 201—211.

Some tests to ascertain the carbon content in blood. Additional tests to ascertain the carbon content in blood. Abildgaard and Viborg.

Leaf from one of *P. C. Abildgaard's* notebooks with notes on Lesson VI, written in his early days in Lyons. The Danish Veterinary and Agricultural Library.

Des Parties qui environnent le Globe

cette conjonctive forme un autre repli du coté du grand angle dans lequel repli est renfermé un croissant cartilagineux que quelques uns ont nommé la Membranne clignotante dont l'oeil de l'homme n'a pas été pourvu.

6.me Leçon

Dans le nombre des parties qui environnent le Globe nous avons encore

Les Muscles & les Graisses.

Les muscles sont au nombre de sept: quatre droits, deux obliques, & un orbiculaire.

Des quatre droits l'un est a la partie superieure du Globe & se nomme Releveur parcequ'il est destiné a le relever.

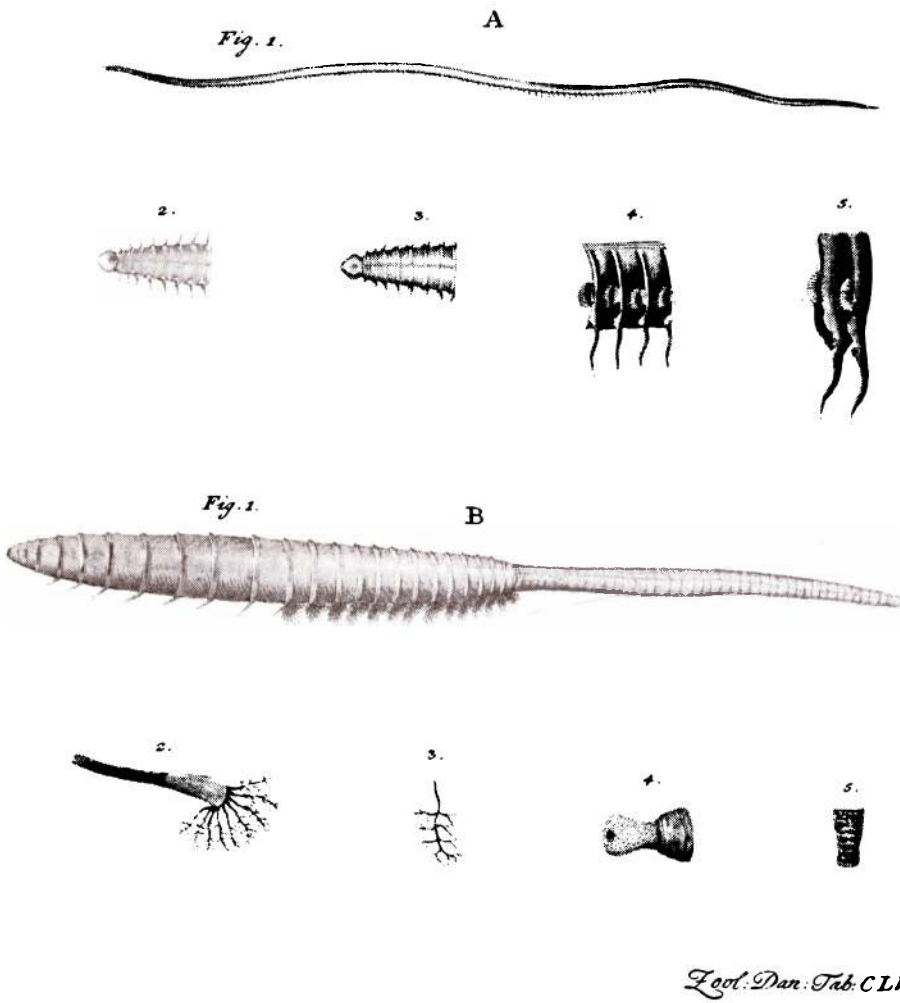
l'autre est a la partie inferieure & s'appelle L'abbaisseur parcequ'il est destiné a l'abbaisser.

le 3.me est a la partie laterale interne & se nomme L'adducteur parcequ'il sert a ammener l'oeil en dedans.

le 4.me enfin est a la partie laterale externe, nous le nommons abducteur parcequ'il est destiné a diriger l'oeil du coté de dehors.

des deux oblique, l'un se nomme Le grand oblique & est situé a la partie superieure; l'autre se nomme le Petit oblique & est situé a la partie inferieure. Ces deux derniers sont destiné a contrebalancer l'action des 4 muscles droit, & a operer les mouvemens du Globe; lorsqu'ils agissent seuls ils le font tourner sur son axe.

Enfin il est un 7.me muscle commun a tous les quadrupede, mais que nous ne trouvons point dans l'homme nous le nommons orbiculaire parcequ'il est placé circulairement autour de la cornée opaque & du nerf optique. son usage, dans les quadrupedes qui, pour paitre, ont sans cesse la tête baissé, est de soutenir le Globe dont le poids tirailleroit & fatiguerait non seulement tous les autres muscles dont nous venons de parler, mais encore le Nerf optique qui en fait la partie posterieure & auquel il est intimement uni & suspendu, puisque les Membranne de la Retine, comme vous le verré, n'est qu'une Expansion de ce Nerf.



A. *Lumbricus squamatus* (Fig. 1—5).
B. *Lumbricus marinus* (Fig. 1—5).
From *Zoologia Danica*, 1806, Vol. IV, 39—41.

Observations concerning the feeding of horses with barley instead of oats.
On the chemical constituents of arendalite, formerly called green schørl from Arendal, given by Gmelin and Vauqvelin.
History of the Life-Saving Society, its aims and position.

Extract af Indberetninger til den kgl. Direktion for Stutterivæsnet om Faareavlen i Norge *Phys. Oec. og Med.-Chir. Bibl. XVIII.* 129—182.

Extract of reports to the board of the royal stud on sheep breeding in Norway.

Om norske Titanertser og om en ny Steenart fra Grønland, som bestaar af Flusspatsyre og Alunjord. *Vid. Selsk. Skr. I.* 305—316.

On Norwegian titanic iron ore, and a new variety of rock from Greenland consisting of fluorspar and alum earth.

1801. Mineralogiske Efterretninger. *Nyt. Bibl. f. Physik. I.* 274—276.

Mineralogical reports.

584. Brev til Overbergraad Karstens om Norges Mineralogi. *Neue Schriften d. Berl. Ges. naturf. Fr. III.*

Letter to Councillor Karstens on the mineralogy of Norway.

1804. Fortegnelse over Dyr og Planter paa Helgoland og de Fugle, som paa deres Træk besøger Øen. *Vermischte Schriften (Joh. Fried. Zöllner).*

List of animals and plants on Heligoland, and the migratory birds which visit the island.

1806. *O. F. Müller. Zoologia Danica.* 4de Bind. En Del heraf er Abildgaards Værk.

Zoologia Danica. 4th vol. Part of the contributions are by Abildgaard.

1813. „*Dannora*". P. 13. „Om Forfængelighed" (efterladte Papirer).

"On vanity" (found among Abildgaard's private papers).

LETTERS *from* P. C. ABILDGAARD IN THE ROYAL LIBRARY, COPENHAGEN

			shelfmark	
To his wife Anne Kirstine	dated	26/2 1793	Collin Brevs. 37 under Henv. Kröyer	
– Nicolai Abildgaard		*24/10 1772	Ny kgl. Samling 2337, 2°, afskr.*	
– – –		*28/11 1772	do.	do.
– – –		*13/3 1773	do.	do.
– – –		*18/1 1774	do.	do.
– – –		28/6 1786	do.	
– – –		–/7 1786	do.	
– – –		16/2 1793	do.	
– – –		12/9 (1800)	do.	
– – –		16/11 1772	Abr. 4°	
– – –		1/10 1774	do.	
– – –		2/5 1775	do.	
– – –		25/7 1775	do.	
– – –		4/10 1776	do.	
– – –		15/11 1777	do.	

– Th. Bugge	13/11 1798		Ny kgl. Saml. Fol. 1304, VI 8 & 6
– – –	18/12 1798		do. do. do.
– Hornemann	23/10 (17)99		Abr. 4°, nr. 20
– Prof. A. Kall (?)	15/11 1785		Werlauff's Ms. Nr. 32
– Chr. Martfelt	24/3 1772 to 6/8 1778	}	50 letters. Ny kgl. Samling. Fol. 1344
– D. G. Moldenhawer	8/1 1797		Ny kgl. Samling 4to 2396
– Georg Zoega	15/12 1794		Ny kgl. Samling 4° 2754
– H. C. Ørsted, 2 letters	13/2 1800 22/8 1800	}	Ørsted 1–2, 2°
– Excellence (?)	12/12 1789		Ny kgl. Samling Fol. 1299e 200 & 201
– –	12/11 1795		do. do. nr. 201
– ?	19/5 1800		Copied by Gyllemborg, Nyere Brevsaml. D

Besides these letters written by P. C. Abildgaard, there is one letter at Royal Library in Copenhagen written to P. C. Abildgaard from A. W. Hauch and dated 5/10 1796 (shelfmark: Ny kgl. Samling Fol. 1299b 135).

ICONOGRAPHY OF P. C. ABILDGAARD

A medal designed by Sergel, 1800, (now lost). Copper-plate engraving by Flint.

Painting by C. F. v. Breda, 1800 (Frederiksborg Castle). Postage stamp designed after Breda's painting by C. Achton Friis engraved by C. Slania, 1973.

Bust on a monument by A. Hassel, 1910 (Royal Veterinary and Agricultural University).

A couple of earlier portraits bearing the name P. C. Abildgaard (one at Frederiksborg Castle) by unknown artists.

Two lithographs 1844 and 1866 said to be after A. C. Jensen (?).

G. Michelsen exhibited a pastel drawing 1825, a copy after Jens Juel.

Medal by J. Conradsen.

Sepulchral monument designed by N. Abildgaard, executed by Lahde.

CHRONOLOGY

1740 P. C. Abildgaard born in Copenhagen.

1763—1766 Sojourn in Lyons, studies at the newly-established veterinary school.

1768 Marries Margrethe Kirstine Jagenreuter.

1768 Doctoral treatise entitled "De venaesectione in suppressis menstruis" is published.

1770 First edition of his book on the treatment of equine and bovine diseases.

1773 Opens the Veterinary School in Copenhagen.

1773 Member of the Stud Commission.

1774—1778 Vice President of *Det kgl. danske Landhuusholdningsselskab*, the Royal Agricultural Society of Denmark.

1776 Member of *Videnskabernes Selskab*, the Society of Sciences and Letters.

1783 Sells his library.

1784 Balloon ascent over Copenhagen.

1790 Travels through Denmark and Duchies Schleswig-Holstein incl. Heligoland.

1793—1794 Travels in Germany, Italy, Portugal and Spain.

1798 Travels in Norway.

1800 Travels in Norway and Sweden.

1801 Dies in Copenhagen.

NOTES AND DESCRIPTORS

Sigurd Andersen, * 23rd December, 1919, assistant professor, D.V.M. 1952. Graduate in agriculture 1943. Reader in anatomy at The Royal Danish Veterinary and Agricultural University, Department of Normal Anatomy from September 1948. Assistant professor same place from December 1955. Assistant professor at the Department for Special Pathology and Therapy from June 1963. His papers deal with different fields of veterinary medicine (anatomy, parasitology, and history of veterinary medicine).

Niels Haarløv, professor, * 2nd August, 1919. Ph.D. 1946 (Zoology, University of Copenhagen). D.Sc. 1960 (Microarthropods from Danish Soils). Professor at the Royal Veterinary and Agricultural University, Copenhagen, 1967.
Member of expeditions to Greenland (1939—40) and Afghanistan (1948).
Published papers on ecology of soil animals and ectoparasites besides on taxonomy of mites. Has been a member of the board of the Entomological Society of Denmark. Is a member of the advisory board of *Pedobiologia* and of *The International Journal of Acarology*.
For several years engaged in problems relating to nature conservancy in Denmark and Greenland.

Ivan Katić, * 11th August, 1930 in Slav. Brod, Yugoslavia. D.V.M. (Zagreb, 1956; Copenhagen, 1959). Employed by different Danish veterinary institutions, since 1965 member of the staff of the Danish Veterinary and Agricultural Library, Copenhagen. His papers deal with veterinary medicine and librarianship. Editor of *Historia Medicinae Veterinariae*. Committee member of World Association of the History of Veterinary Medicine and Danish Association of the History of Veterinary Medicine. Honorary member of Sociedade Portuguesa Veterinária de Estudos Sociológicos and Yugoslavian Assoc. for the History of Vet. Medicine. Published in 1982 his doctoral thesis: Danish-Russian veterinary relations 1796—1976.

Peter Nansen, professor, * 8th June, 1938. D. V. M. 1965 at the Royal Veterinary and Agricultural University, Copenhagen. D. V. Sc. 1970 (Metabolism of bovine immunoglobulins). Professor in veterinary parasitology 1984 at the Agricultural University of Sweden, Uppsala. Professor in veterinary parasitology 1985 at the Royal Veterinary and Agricultural University, Copenhagen.
Published papers on pathophysiological, immunological, ecological and control aspects of parasitisms.
President of the Scandinavian Society of Parasitology 1985.

Linguistic assistance: *Jean Olsen.*

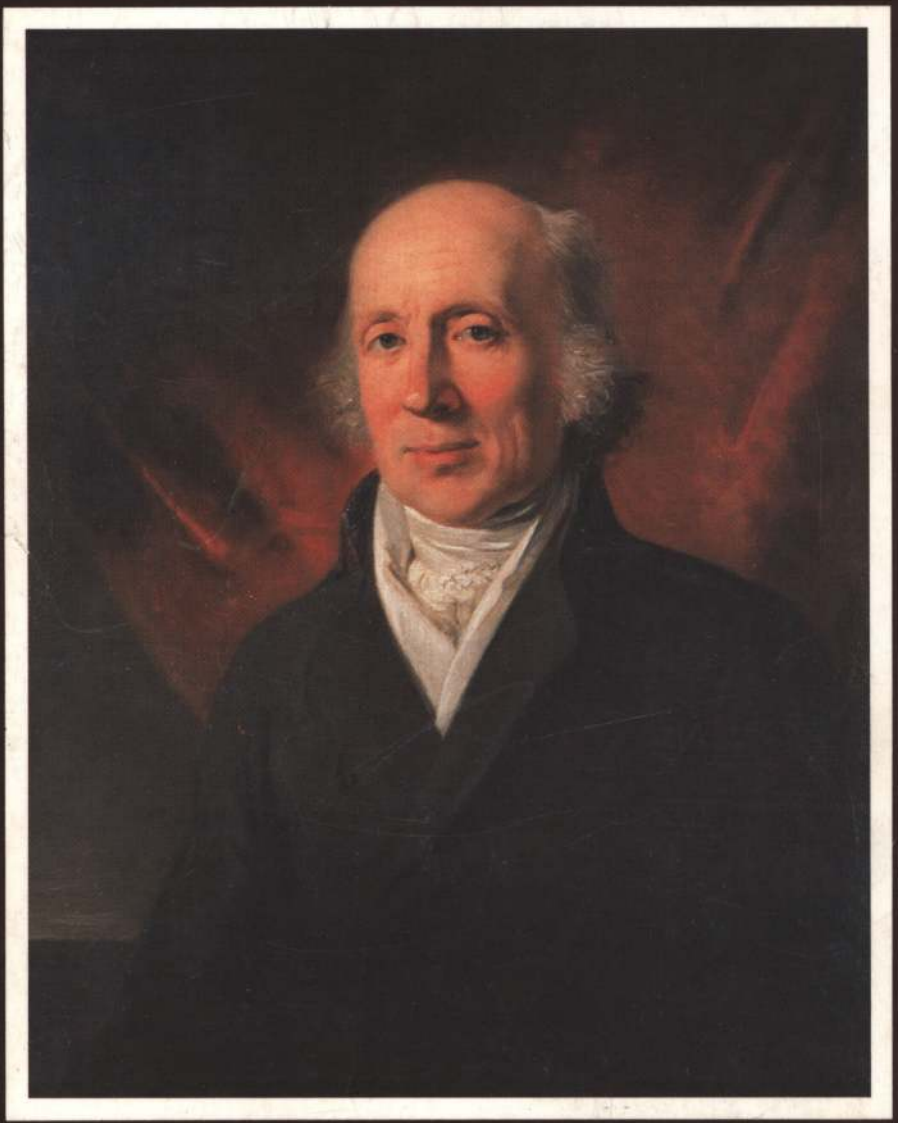
Descriptors: Abildgaard, P. C., Denmark, biography, bibliography, private library, cattle-plague, veterinary school, zoology, parasitology, botany.


SEIGL DEN KONGELIGE VETERINÆR-SKOLES
17 73

PETER CHRISTIAN ABILDGAARD, founder of the Danish School of Veterinary Science, numbers among our great eighteenth-century scientists. His achievements in veterinary research should also be seen in context with the crucial importance of cattle to the national economy of Denmark. Cattle-plague was the scourge of the country during the 1700s, and the government of the time requested Abildgaard – a promising young medical student – to study the cattle-plague in France. After he returned to Denmark he founded Scandinavia's first veterinary college in 1773 in Copenhagen.

The cow has always been the Danish farmer's most important domestic animal, and in Norse mythology the cow is prominent in the stories of the creation and the imagery of cosmos. P. C. Abildgaard's brother, *Nicolai Abraham Abildgaard* is considered by many to be the Nestor of Danish art. He often portrayed mythological scenes, and the flap of this book shows his painting of the creation of the world with the giant *Ymer* (*Augelmir*) suckling from the cow *Audhumla*. The legend relates how they both took shape in the void of the dawn of time, between ice and rime to the north, and sparks and fires to the south. It also tells of how Ymer fed from the four rivers of milk flowing from Audhumla's udders.

A more central position than that of the cow in the conceptual universe of Man is hard to envisage. And for a scientist like P. C. Abildgaard, who wished to serve society, it is difficult to imagine a more meaningful task than fighting the enemies of this animal.



»... The spread of knowledge and enlightenment can no longer be stopped or curbed by any human force. Yet, sometimes, if in a country crudeness and ignorance combine with power and cunning tyranny, it weakens or suppresses the desire for scientific study within the frontiers of that country; but sooner or later such a country becomes dependent on and oppressed by the enlightened people of neighbouring countries which surround it. Increasing population and wealth are insufficient to maintain balance there, where inequality in education exists.«

Excerpt from P. C. Abildgaard 1793, *Nogle Forsog i*
Dyrenes Oprindelse og Aarsagen til Vandets F
Naturhistorie-Selskabet, III, 70-90. (P. 72).