

This is a working document with relevant links and data about Drebbel, for further reference.
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Francis Franck, Juli 2009

[Peiresc et le microscope.](#)

Pierre Brunet

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pp. 154-158 (zie <https://sites.google.com/site/aboutdrebbel/dossiers/uitvindingen>)

Title	Geschichte der menschlichen Narrheit , oder Lebensbeschreibungen berühmter Schwarzkünstler, Goldmacher, Teufelsbanner, Zeichen- und Liniendeuter, Schwärmer, Wahrsager, und anderer philosophischer Unholden
Author	Johann Christoph Adelung
Publisher	Weygand, 1785
Original from	Oxford University
Digitized	7 Feb 2008
Length	347 pages

(Ik heb de volledige [digitale Google tekst gecorrigeerd](#) om het artikel leesbaar te maken.) (Zie <https://sites.google.com/site/aboutdrebbel/per-auteur>)

Title	Het leven van Hillegonda Ruisman : eene hollandsche familiegeschiedenis uit de zeventiende eeuw (not yet referred)
Author	Adriaan Loosjes
Publisher	Loosjes, 1814
Original from	the Bavarian State Library
Digitized	28 Aug 2008
Length	359 pages

o.a.. ...HILLEGONDA kon het niet nalaten van tegen den ouden wijsgeer grimlagchende te zeggen. „Dat zijn toch booze uitwerksels van dat weer, vader DREBBEL." „Ik beken, hernam deze, ik beken dat het lieden, die het treft, onaangenaam is, maar ik blijve er bij, dat, het nut, hetwelk door deze bui veroorzaakt is, oneindig, onberekenbaar verre de kleine nadeelen te boven gaat, die er eenige weinige bij zullen lijden." DREBBEL bedankte juffrouw KROMBALG voor hare schuilplaats en vertrok. Daar nu de bui naar het Noorden was afgedreven en de lucht zoo aanmerkelijk bekoeld, zette juffrouw KROMBALG de vensters open, en genoot met HILLEGONDA de aangename verkwikking van de gezuiverde lucht. „Gij antwoordde, zeide HILLEGONDA tegen mejuffrouw TESSELSCHADE., gij antwoordde zeer weinig op het geen, DREBBEL over het onweder zeide." „Ik had, hervatte deze, weinig lust om met hem te redetwisten; en hij had ook in den aard der zake zelve gelijk, maar hij is mij wat al te gestreng in zijn oordeel over de wezenlijke rampen, die er toch uit zulk een ontzettend weder geboren worden. ...

Title	Experimental researches concerning the philosophy of permanent colours : and the best means of producing them, by dyeing, calico printing, &c
Author	Edward Bancroft
Edition	2
Publisher	T. Dobson, 1814
Item notes	v. 1
Original from	Harvard University
Digitized	13 Jul 2007
Length	394 pages (zie https://sites.google.com/site/aboutdrebbel/per-auteur)

But others, and particularly Beckman, assert that it occurred to a Dutch chemist, Cornelius Drebbel, who was born at Alkmaar, and died at London in 1634,* and that he communicated this occurrence to Kuffler, who was an excellent dyer at Leyden, and afterwards became the son-in-law of Drebbel. That Kuffler put the discovery into practice in his dye-house, and that the scarlet was thence first named Kuffler's colour, and afterwards scarlet of Holland, or Dutch.

Mr. Macquer, in a memoir printed among those of the Academy of Sciences at Paris for 1768, says, " Drebbel, chimiste Hollandois, a imagine d'employer dans la teinture de cochenille, de la dissolution d'étain faite par l'eau regale, et des lors on a obtenu le plus vif et le plus éclatant de tous les rouges don't l'art, et meme la nature nous ait donne l'idee; je veux dire l'écarlate couleur de feu, qui a porte d'abord le nom *d'escarlate de Hollande*, parce que c'est dans ce pays que les premieres manufactures ont été établies," &c.

Title	Constantini Hugonii De vita propria : sermonum inter liberos libri duo
Authors	Constantijn Huygens, Petrus Hofman Peerlkamp, Adriaan Pieterszoon Loosjes
Editor	Petrus Hofman Peerlkamp
Translated by	Adriaan Pieterszoon Loosjes
Publisher	apud A. Loosjes, 1817
Original from	the University of California
Digitized	9 Jan 2008
Length	271 pages (zie https://sites.google.com/site/aboutdrebbel/per-auteur)

...
 Ook Drebbel, schoon 'k slechts kort dien landgenoot begroette,
 Was 't, dien ik bij den Brit, op dezen togt, ontmoette,
 Die, boersch van aanschijn en vervreemd van pralerij,
 De wijzen van Sicielje en Samos fluk op zij.
 Niet lang was 't mij vergund in 't vaderland te rusten;
 't Staatkundig oog, gelokt naar de Indiaansche kusten, ...

Ik schepte 't ganfche jaar, weêr streelend zielsvermaak,
 Uit uwen ommegang, o Drebbel! die zoo vaak
 Mij uren achtereen hebt onderwijs geschonken;
 En daar gij in mijn' geest een aandrift zaagt ontvonken
 Tot vlijtig onderzoek, scheent gij met mij *gediend*,
 Ja gaaft de voorkeus mij ligt boven menig vriend.

Title	Algemeen woordenboek van kunsten en wetenschappen : met Aangangsel op het woordenboek van kunsten en wetenschappen
Authors	Gerrit Nieuwenhuis, Gt Nieuwenhuis
Publisher	Thieme, 1821
Original from	Ghent University
Digitized	18 Jul 2008 (zie https://sites.google.com/site/aboutdrebbeel/per-auteur)

DREBBEL. (KORNELIS) Deze vernuftige vaderlandsche natuur- en werktuigkundige verdient, wegens de fraaije vindingen, die aan hem worden toegeschreven, eene plaats onder de voorname mannen van *Nederland*. Hij werd te *Alkmaar* in 1572 geboren, en vertoonde al vroeg eene sterke neiging voor de Wijsbegeerte, waarin hij zulke verbazende vorderingen maakte, dat zijn roem tot in het paleis van FERDINAND II doordrong, die hem den aanzienlijken post van onderwijzer zijns zoons toevertrouwde, en hem naderhand onder het getal zijner raden plaatste. De fortuin bleef hem gunstig tot den ouderdom van 28 jaar, toen deze wispelturige vrouw hem den rug toekeerde. Hij werd, bij het bemagtigen der stad *Praag*, door FREDERIK, keurvorst van den *Paltz*, toenmaals koning van *Bohème*, met anderen van des keizers raden, gevangen genomen, en van al zijne goederen beroofd; doch verkreeg, door tusschenspraak van de algemeene staten en des konings van *Engeland*, zijne vrijheid.

Sedert vertrok DREBBEL derwaarts, en schonk den koning, uit erkentenis, eene glazen spher of bol, waarin men verzekert, dat men, door middel der 4 hoofdstoffen, de altoosdurende beweging voortbragt, en men in den tijd van 24 uren alles konde waarnemen, wat in een jaar op de aarde voorvalt; terwijl men tevens op alle de jaren, dagen en uren, den loop der zon, maan, en sterren konde opmerken. Door hetzelfde middel kon men begrijpen, waarin de koude bestond; welke de oorzaak *zij* der eerste beweging; hoedanig die de zon, den hemel, al de sterren, de maan, zee en aarde in beweging houdt; welke de oorzaak zy van eb en vloed, van donder, bliksem, regen, en wind, en hoe alle dingen groeijen en toenemen.

Behalve dezen bol vervaardigde hij, zoo men zegt, een schip, waarmede men van *Westmunster* tot aan *Greenwich*, een afstand van bijna 3 uren, onder het water konde roeijen, en waarin men zonder kaars konde zien en in een boek lezen. Dit schip zag men nog, verscheidene jaren na den dood van DREBBEL* aan den oever van *den Teems* liggen. Ook wist hij zekere werktuigen te vervaardigen, waardoor hij den regen, den donder en den bliksem zoo natuurlijk nabootste, als of dezelve onmiddellijk uit den dampkring kwamen; terwijl hij door middel van andere eene koude wist voort te brengen, welke aan die van den winter gelijk was. Van dit laatste nam hij eens, naar men verzekert, op 's konings verzoek, eene proeve in de zaal van *Westmunster*, en deed, op eenen zomerschen dag, eene zoo felle koude ontstaan, dat de vorst en de hovelingen, die hem vergezelden, genoodzaakt waren om de zaal te verlaten. Hij wist, door middel van zekere werktuigen, aan de oogden der aanschouwers allerlei soorten van schilderijen te vertoonen, zonder dat er iets wezenlijks voorhanden was, en trok, door een glas van Zijne uitvinding, het licht van eene kaars, aan het einde van een vertrek geplaatst, tot aan de tegenoverzijde, hetwelk zulk eene flikkering voortbragt, dat men er gemakkelijk bij kon lezen. Nog vervaardigde hij eenen spiegel, die geheel vlak was, en het voorwerp dat men er voorhield, zeven maal terug kaatste; alsmede allerlei muzikale instrumenten, die aanhoudend speelden. In één woord, alles, wat met mogelijkheid konde gemaakt worden, om, door een dalend gewigt, springveren, loopend water of vuur, gedurende eenen bepaalden tijd werk-werkzaam te blijven, was hij van oordeel, dat door de kennis van het *primum mobile* tot altoosdurendheid konde worden gebragt. Behalve nog vele andere zeldzaamheden, sleep hij brillen, waardoor men bij nacht zien konde.

Hoe verwonderlijk dit alles ook zijn moge, zeker is het, dat DREBBEL eene buitengewone kennis in de werktuig- en gezigtkunde bezat, en verscheidene wiskunstige werktuigen heeft uitgevonden, onder anderen de zamengestelde mikroskoop, en, omstreeks het einde van 1630, den thermometer, die door L'ISLE, HALLEU, FAHRENHEIT en REAUMUR, naderhand, tot meerdere volkomenheid zijn gebragt geworden. De uitvinding der teleskoop, mede door sommigen aan hem toegeschreven, is waarschijnlijk van vroegeren tijd.

DREBBEL stierf te *Londen* in 1634, in het 62ste jaar zijns levens, Onder zijne nagelatene schriften telt men: *Tractatus de natura elementorum quintessentia*, te *Leijden* in 1608 {2}, en in 1702 te *Rotterdam* {19} in het Nederduitsch, uitgegeven, alsmede *Epistola de machina Astronomica perpetuo mobili*, in 1620 te *Leijden* {?} uitgekomen, en eindelijk eenen brief aan keizer RUDOLPH II, te vinden in HARSDÖRFFERS *deliciis Physico mathemat.* II d. blad. 399, waarin hij een Werktuig beschryft , door hem *Machina musica perpetuo mobilii* genoemd.

DREBBEL. (N.) Een Nederlander, die door scheikundige proeven de kunst ontdekte, om scharlaken te verwen. Hij leefde In het laatst der 17de eeuw, en vertrouwde zijn geheim aan zijne dochter, welker man, CUFFLER, van deze uitvinding het eerst in *Leijden* gebruik maakte.

Title	Library of useful knowledge : Natural philosophy...
Authors	Society for the Diffusion of Useful Knowledge (Great Britain), Society for the Diffusion of Useful Knowledge (Great Britain).
Publisher	Baldwin and Cradock, 1832
Item notes	v. 2
Original from	Oxford University
Digitized	15 May 2006 (zie https://sites.google.com/site/aboutdrebbel/per-auteur)

CHAPTER I.

Of the Common Thermometer.

§ 1. *History and Construction of the Thermometer.*

THE invention of the thermometer, like almost every other discovery of great utility, has been claimed for different philosophers; and national vanity has occasionally been enlisted in support of the pretensions of rival claimants. There seem, however, but two whose titles are worthy of notice.

The Italian writers generally give the honour to their countryman *Santorio Santorio*, long a physician at Venice, and afterwards a professor at Padua, who flourished about the beginning of the seventeenth century; and who had obtained just celebrity by his discovery of the insensible perspiration of the animal frame: the Dutch philosophers as unhesitatingly ascribe it to *Cornelius Drebbel*, a physician of Alkmaar, who appears to have enjoyed a high reputation as a chemist, a mathematician, and an inventive mechanical genius.

Santorio expressly claims the invention as his own,* and he is supported by Borelli † and Malpighi; ‡ the title of **Drebbel** is considered as undoubted by Boerhaave § and Musschenbroek. || It would now be difficult, perhaps, to decide the controversy; but it is worthy of remark, that Santorio, who was born in 1561, and died in 1636, ¶ did not publish his claim to the invention till 1626; ** and, although thermometers are alluded to by Robert Flud, within the first quarter of that century, yet as he travelled both in Germany and Italy for six years, we can draw no inference from that circumstance. Certain it is, that thermometers were constructed about the same time, both in Italy, and in Holland, on the same principle; and though the instruments of **Drebbel** were well known in Holland and England, before the fame of Santorio appears to have reached the North-West of Europe, the most recent writers have generally considered the latter as the real inventor of the thermometer. It is, however, by no means improbable that each may be justly entitled to the merit of a discoverer.

Be this as it may, the instrument was, from its imperfect construction, of little use in the hands of either, and required the successive labours of different philosophers to render it a tolerably accurate indicator of the variations of temperature.

The thermometer ascribed to Santorio and to **Drebbel**, is precisely the same in form and principle. It consists of a glass tube, with a ball blown on one of its extremities A, (fig. 1.) and having the other end open. A portion of the air in the ball is expelled by heat, and then the open end of the tube is immersed in any liquid contained in the cup c. As the ball cools, the included air diminishes in volume, and the liquid is forced into the stem, as at b, by the pressure of the atmosphere, until it replaces the volume of air which was

Fig. 1.



expelled by the heat. When a heated body is applied to the ball A, the air will again be expanded, and depress the liquid in the stem; and, if this stem be a cylinder, a scale of equal parts applied to it will enable the observer to form some idea of the difference between the relative temperature of bodies applied to the ball. On the removal of the heated body, the volume of the included air again diminishes, and the liquid again rises in the stem by atmospheric pressure, until the elasticity of the air within the instrument is in *equilibrio* with that of the surrounding atmosphere. Instruments constructed on this principle are termed *air thermometers*; because their action depends on the elasticity of air; and from their having been originally employed to mark the changes of atmospheric temperature, they are described by the older writers under the name of *weather-glasses*; a denomination also given to barometers.

Drebbel appears to have devised a variety of the instrument more delicate in its indications. The globular form of the common bulb, and its small size, rendered it less susceptible of slight changes than a flattened bulb of larger diameter; and Boerhaave describes the bulb of Drebbel's thermometer, as composed of two shallow segments of large spheres, as in fig. 2. A, united at their edges, and in fig. 2. B, where it is seen in profile.

Fig. 2. A.

Fig. 2. B.



In the obscure, and often almost unintelligible, writings of our countryman, Dr. Robert Flud, published about the beginning of the seventeenth century, frequent mention is made of the thermometer, or, as he calls it, *speculum*

* Comment. in Galen. et in Avicenn.

† De Motu Animalium. Prop. clixv.

‡ Opuscula Posth. p. 30.

§ Elementa Chemicæ, tom. i. p. 152.

|| Elem. Phil. Nat. § 780.—Tentam Exp. Acad. Cim.

¶ Tiraboschi Storia, tom. viii. P. J., 323.

** Commentaria in Avicennam.

Title [Bibliotheca Chemica](#)
 Author John Ferguson
 Publisher Kessinger Publishing, 2002
 ISBN 0766126374, 9780766126374
 Length 512 pages (zie <https://sites.google.com/site/aboutdrebbe/per-auteur>)

DREBBEL (CORNELIUS).

Cornelii Drebellii von Alckmar in Nord-Holland Tractat oder Abhandlung von Natur und Eigenschafft der Elementen, ingleichen des Donners, Blitzes, Hitze, Kälte, Windes, Regens, Hagels und Schnees, &c., so sich in der obern und untern Region erzeigen und wozu sie Anlaß geben. Deme vorgefüget einige Merckwürdigkeiten, so man hin und her von diesem weisen Mann angetroffen, nebst einem Anhang von der Quint-Essenz oder 5ten Wesen in allen drey Reichen der Natur. Und einer Zueignungs-Schrift, von dem Primo mobili oder erstbeweglichen Dinge. Wie auch Herrn Edmund Hallei Erzehlungen von denen Winden, zusammen gesammelt und herausgegeben von Polycarpo Chrysostomo. Leipzig, verlegt Johaß Sigmund Strauß, Buchhändler in Hoff. 1723.

8°. Pp. [28] 106. [List of books, etc., 5, 1 blank]. Title red and black. 1 woodcut. 2 engraved leaves.
 Halley's tract on the winds begins on p. 65 with a separate title, but the signatures and pagination are continuous.

Cornelii Drebelli von Alkmar, des sehr berühmten Philosophi und fürtrefflichen Adepti, Gründliche Auflösung, von der Natur und Eigenschafft der Elementen, und was die Ursache dafs Donner und Blitz, Hitz und Kälte, Winde, Regen, Hagel und Schnee, sich in der obern und untern Region erzeugen, und worzu selbige Anlaß geben? Mit einem Anhang und klaren Beweifs, die von so vielen gesuchte Quint-Essenz aus allen dreyen Reichen zu haben, auch herrlichen Dedication vom Primo Mobili, sambt andern raren Physicallischen Fragen, von einem Liebhaber der Hermetischen Kunst herausgegeben. Franckfurt am Mäyn, verlegt Margaretha Gertraud Isingin im Jahr Christi 1715.

8°. Pp. 118.

Abhandlung von der Quintessenz.

See SCHRÖDER (FR. J. W.), Neue Alchymistische Bibliothek, 1772, I. ii. p. 291.

Deux Traitéz Philosophiques :

I. De la nature des Elemens.

II. De la Quinte-Essence.

See DIVERS TRAITÉZ de la Philosophie Naturelle, 1672, p. 175.

Drebbel was born at Alkmaar in Northern Holland in 1572. Though only a peasant he was wealthy, but in the wars he was taken prisoner and lost his property. On being set free he came to London, where he died in 1634. He constructed a submarine boat in which he sailed from Westminster to Greenwich, and he seems to have been an ingenious mechanic and maker of apparatus, and a clever optician, and he has been even

credited, though inaccurately, with the invention of the thermometer. He discovered, in part accidentally, the lake formed when a tin salt is added to cochineal, which was used for dyeing scarlet, and as an alchemist he was in communication with Rudolph II. In the present work on the elements he describes experiments to illustrate the formation of the wind.

His tracts were written in Dutch, and printed

DREBBEL (CORNELIUS). *Continued.*

- at Rotterdam in 1702. They were translated into Latin by Joachim Morsius (Hamburg), 1621; Geneva, 1628. The French translation appeared at Paris, 1673, 12°. Hoefler mentions
- Borel, *De vero Telescopii Inventore . . . Historia*, 1655, pp. 19, 22, 37, 56, 57 ('vir circa naturæ secreta curiosissimus').
- Becher, *Närrische Weisheit*, Frankfurt, 1682, p. 149. (The submarine boat.)
- Mercklin, *Lindeni renovatus*, 1686, p. 226.
- Paschius, *De inventis nov-antiquis Tractatus*, Lips., 1700 (refers p. 624 to the thermometer, p. 651 to the submarine boat with which he sailed under the Thames, p. 698 to his Perpetuum Mobile, and p. 700 to various optical instruments).
- Morhof, *Polyhistor*, Lubecæ, 1732, ii. p. 326 (Drebbel's telescope); p. 337 (tract on the Elements).
- Zedler, *Universal Lexicon*, Halle u. Leipzig, 1734, vii. col. 1412.
- Weidler, *Historia Astronomiæ*, 1741, p. 437.
- Lenglet Dufresnoy, *Histoire de la Philosophie Hermétique*, 1742, i. p. 472; iii. p. 152.
- Jöcher, *Allgemeines Gelehrten-Lexicon*, Leipzig, 1750, ii. col. 212.
- Fictuld, *Proßler-Stein*, 1753, Th. i. p. 68 (extolled for his piety).
- Moréri, *Le Grand Dictionnaire Historique*, 1759, iv. p. 245 (list of his inventions).
- Haller, *Bibliotheca Medicinæ practicæ*, 1777, ii. p. 499.
- Eloy, *Dictionnaire Historique de la Médecine*, 1778, ii. p. 80.
- Adelung, *Geschichte der menschlichen Narrheit*, 1786, ii. p. 125 (calls him a charlatan).
- Beckmann, *Beyträge zur Geschichte der Erfün-*
- dungen, Leipzig, 1792, iii. p. 43 (gives an account of the discovery of scarlet).
- Gmelin, *Geschichte der Chemie*, Göttingen, 1797, i. pp. 308, 309, 358.
- J. C. Fischer, *Geschichte der Physik*, 1801, i. pp. 181, 200 (on the microscope), 215 (thermometer).
- Schmieder, *Geschichte der Alchemie*, 1832, p. 359.
- Ersch & Gruber, *Allgemeine Encyclopädie*, 1836, xxvii. p. 357.
- Libri, *Histoire des Sciences Mathématiques en Italie*, 1841, iv. p. 193 (about the thermometer).
- Hoefler, *Histoire de la Chimie*, Paris, 1843, ii. p. 133; 1869, ii. p. 128.
- Biographie Universelle*, 1852, xi. p. 299.
- Nouvelle Biographie Générale*, 1855, xiv. col. 745.
- Van der Aa, *Biographisch Woordenboek*, Haarlem, 1858, iv. p. 322 (and the references).
- Poggendorff, *Biographisch-literarisches Handwörterbuch*, 1863, i. col. p. 602.
- Ladrague, *Bibliothèque Ouvaroff, Sciences Secrètes*, 1870, Nos. 922-23.
- Poggendorff, *Geschichte der Physik*, 1879, pp. 257 (thermometer), 259 (life), 260 (microscope, various machines).
- Mittheilungen zur Geschichte der Medizin und Naturwissenschaften, herausgegeben von der Deutschen Gesellschaft für Geschichte der Medizin und der Naturwissenschaften*, 1902, No. 3, p. 143 (article by E. Wohlwill on the early history of the Thermometer).

[De Caus family and Drebbel https://sites.google.com/site/aboutdrebbel/per-auteur](https://sites.google.com/site/aboutdrebbel/per-auteur)

Salomon may have also had a different role. Rosalie Colie, for example, discusses his influence on Bacon's New Atlantis. She notes that Bacon would have had few examples for his academy since only Brahe and Rudolph II had managed to assemble anything that even remotely resembled our modern notion of a scientific academy. Instead, Bacon had to look to other influences from Prince Henry's court, notably Salomon de Caus and Cornelis Drebbel.

The mechanical engines noted by Bacon may have been influenced by the work of de Caus: "However unimportant Caus's elaborate renaissance fountains might appear to the casual student, they were no mere toys for princes and great ones; the complex motions of his moving figures and of his musical fountains resulted from genuinely imaginative experimentation in mechanics." (pg. 250)

She continues:

"From such contemporaries as Drebbel and Caus, like him conducting their business in the sovereign's service, he could perceive the remarkable results of dedicated occupation with particulars; from them the practical method of his academy took form. The great parable of Salomon's House the two inventors, the two projectors contributed; their creative imaginations moved Bacon to his visions of an unequalled utopian world, a utopian ideal to be put into practice, a purpose for the perpetual motion of the advancement of learning." (pg. 260)

Bachrach (1980) compares Salomon to Leonardo: "The Renaissance engineer was, like him, both artist and artisan, both military expert and organizer of Courtly entertainment--a professional, in other words, whose mind was primarily turned towards obtaining thought-provoking effects from the not invariably 'holy' alliance of science and Humanism. Drebbel and De Caus were such characters, even if De Caus was the greater talent and the more creative personality." (pg. 47)

The elder de Caus may also have had an influence on Christian Huygens... or at least his father. Constantine Huygens was working as an ambassador in England where he ran in the very particular circle of Sir Robert Killigrew. Killigrew's wife was the former Mary Woodhouse, niece of Sir Francis Bacon. This circle also included the widow of Sir Walter Raleigh (Bess Throckmorton, who managed the Irish estates at Youghal that Raleigh sold to Robert Boyle's father), Ben Jonson, John Donne, Inigo Jones, the Huguenots Lanier and Drebbel, Isaac de Caus and Cornelius Drebbel, and--of course--Sir Francis Bacon.

Isaac was also a member of the Killigrew circle. Interestingly, Isaac's greatest accomplishments were at Wilton which was visited by Christian's younger brother Lodewijck in 1652.

Killigrew's circle overlapped with Prince Henry's entourage. Following Henry's death in 1612, Drebbel became attached to the Court of James I while de Caus fell into the entourage of Princess Elizabeth, soon to become the the Queen of Bohemia. After the fall of the Winter Monarchs, de Caus returned to France rather than follow his patrons into exile.

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SCIENCE AND PATRONAGE IN ENGLAND, 1570-1625: A PRELIMINARY STUDY

Stephen Pumfrey and Frances Dawbarn

University of Lancaster

http://drebbel.net/sci_and_pat.pdf (1993 preliminary edition)

(zie <https://sites.google.com/site/aboutdrebbel/per-auteur>)

(Pagenumbers below refer to the 2004 version)

"Dedications to his patron by an author were an important way of publicly signalling a connection. To honour one's patron, or patrons, was necessary, and not just because ..." (p.152)

"But, as in all James's intellectual patronage, religion was more important than science. James's international fame as an irenicist and philosopher-king took off with ..." (p.169)

"The evolution of utilitarianism to include natural philosophy is also detectable in the satellite court of Prince Henry, where some of the clients were survivors from Elizabeth's era. James and Anna appointed members of the prince's household who would fashion him in the image of a sophisticated, learned prince poised to succeed James as a leader of Protestant Europe. His premature death in 1612, aged 18, was treated as a national catastrophe. In evocation of the earlier Henry, and in marked contrast to Elizabeth, the Henrician entourage spearheaded the patronage and collection of art, architectural work, the accumulation of a royal library of thousands of volumes — and the support of natural knowledge." (p.170)

"The Jacobean court even enjoyed ostentatiousness. The Dutchman Cornelis Drebbel fed the royal appetite for entertaining wonders, pyrotechnics, and the 'arts mathematicall', inventing among other things, a perpetuum mobile or automatic musical instrument made to play by the rays of the Sun, and a telescope. Drebbel was a client of both James and Prince Henry, until he attracted the attention of Rudolph II's court in Prague and was permitted to go there in 1610. When Rudolph was deposed in 1612, Drebbel was imprisoned but freed at the request of Henry and, when Henry died also in 1612, James renewed his patronage." (p.172)

"We conclude, then, that English practitioners, perhaps uniquely, lacked the rich and various patronage connections of many European counterparts. Consequently, they were more dependent upon a small group of courtier politicians whose concerns, especially under Elizabeth, were uniform and utilitarian. In consequence, opportunities for self-fashioning were limited. Whilst relatively humble men were able to raise their status and that of the arts they practised, others with aspirations to become innovative natural philosophers were baulked. To repeat, we do not say that early modern English patronage did not support innovation. It was crucial to the consolidation of England as a military and economic power on the world stage and, we suggest, to the growing, confident contributions of empirical practitioners. But our studies thus far suggest that England's utilitarian patronage culture had no need of natural philosophers. This background may offer an explanation of the 'Baconian' character of the emerging 'new philosophy' later in the century." (p. 177)

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Drebbel, Cornelius (zie <https://sites.google.com/site/aboutdrebbel/per-auteur>)

1. Dates: **Born:** Alkmaar, 1572; **Died:** London, 1633; **Datecode:** Lifespan: 61

2. Father: Peasant - Small Farmer; His father, a burgher of Alkmaar, was apparently a well-to-do farmer. I'll list him as prosperous.

3. Nationality: Birth: Dutch; Career: English; Dutch; Czechoslovak; Death: English

4. Education: None Known; He probably only had elementary education, which would have included Latin. He had not university education. As a young man he was apprenticed to the famous engraver Hendrik Goltzius (who incidentally practice alchemy and undoubtedly introduced Drebbel to the Art).

5. Religion: Anabaptist

6. Scientific Disciplines: Instrumentation, Alchemy; **Subordinate Disciplines:** Engineering; In the strict sense he was not a scientist but an inventor or practicing technologist. He left very few writings of his own, and None of them is concerned with his invention. His most famous work was Ein kurzer Tractac von der Natur der Elemetum (Leiden, 1608), an alchemical tract on the transmutation of the elements. Engineering seems the best category for his general activity.

7. Means of Support: Engineer; Patronage; Government Position; **Secondary Means of Support:** Artisan; Instruments; In 1595 he settled at Alkmaar, where he devoted himself to engraving and publishing maps and pictures. He soon turned to mechanical invention, for in 1598 he was granted a patent for a pump and a clock with perpetual motion. In 1602 he was granted a patent for a chimney. He was also an instrument maker. About 1605 he went to London, and soon entered the special service of Henry, the Prince of Wales, in the castle at Eltham as a mechanic especially associated with displays of fireworks. He won attention with a perpetual motion device and with other spectacular devices that seized attention. Payments to him of £20 in both 1609 and 1610 are recorded. Nevertheless Jaeger makes a compelling case that Drebbel never quite made it; he remained at the level, not of a Galileo (who produced spectacles of a different order), but of court entertainers (among whom Drebbel walked at the King's funeral). Largely on the basis of the perpetual motion device, and perhaps his known involvement in alchemy, he was invited to visit Emperor Rudolf II in 1610. Jaeger argues again that he never made it big in Prague. After the death of Rudolph he returned to England in 1613. During the next several years he lived mostly in London. About 1620 he began to devote himself to the manufacture of microscopes (there is controversy here also as to his role in the development of the microscope), and to the construction of a submarine (one of his most famous projects, about which there is pronounced disagreement). For the next several years he was employed by the British navy, partly in connection with the submarine, but mostly to make explosive devices with which to attack other ships, at a fairly high salary. He was involved in a drainage project in East Anglia. Again the extent of his involvement and the extent of his technical expertise is under debate. From 1629 until his death he was extremely poor and earned his living by keeping an alehouse.

8. Patronage: Court Patronage; Aristocratic Patronage; He was taken into the special service of Henry, the Prince of Wales, and was installed in the castle at Eltham, where he was visited by Emperor Rudolf II (although this is asserted, it seems extremely dubious) and by the Duke of Wurttemberg. He dedicated his book on the Nature of the Elements to James I. He was invited to visit Rudolf in 1610. When Rudolf was deposed by his brother, Drebbel was imprisoned. Through the intervention of Prince Henry, he was set free to return to England in 1613. (Again there is disagreement about the particulars.); Drebbel clearly attracted attention by appearing to work wonders. His case then is instructive as to what patronage was about. Jaeger's argument that he never rose above the level of court entertainers must enter into consideration here. Buckingham

appears to have been the source of Drebbel's employment by the British navy in the late 20's. When the expedition to LaRochelle was a dismal failure and when Buckingham was assassinated, Drebbel went down the tubes.

9. Technological Connections: Scientific Instruments; Chemistry; Hydraulics; Dev. Drebbel is hard to categorize, both as to discipline and in regard to this category. He devoted his whole life to practical devices of various sorts; what is hard to determine is the role of science in any of it. Among his best-known inventions are: 'Perpetual mobile', the elaborate toy operated on the basis of changes in atmospheric temperature and pressure. He extended the basic idea to the operation of clocks (though I have not succeeded in understanding this). Thermostats and a thermoscope. He applied the principles used in the perpetual mobile to a temperature regulator for ovens and furnaces. He also applied the same idea to an incubator for hatching duck and chicken eggs. Optics. He invented (or is said to have invented) the microscope with two sets of convex lenses. He made compound microscopes as early as 1619. He also made telescopes, and he developed a machine for grinding lenses. He constructed a camera obscura with a lens in the aperture, and he had some sort of magic lantern that projected images. The submarine. He built a submarine that could carry a number of people in 1620s. There is much discussion about this; apparently it was a set of diving bells, and was thus open at the bottom. Chemical technology. His most important contribution was his discovery of a tin mordant for dyeing scarlet with cochineal. Jaeger argues that in fact Drebbel had no role in this; here I am not sure that I find his case convincing. Drebbel was involved in a project to drain the fens. Earlier he had taken a patent on a pump, and he had constructed fountains.

SOURCES:

Gerrit Tierie, Cornelius Drebbel (1572-1633), (Amsterdam, 1932). L.E.Harris, The Two Netherlanders, (Cambridge, 1961). T40 .B8H3; F.M. Jaeger, Cornelis Drebbel en zijne tijdgenooten, (Groningen, 1922). This is the fundamental book on Drebbel. It throws one big bucket of cold water over the legend. G.C. Gerrits, Grote nederlanders bij de opbouw der natuurwetenschappen, (Leiden, 1948).