

**2010 BECHTEL LECTURES**  
**Science and Mennonites in the Dutch Enlightenment**

LECTURE TWO  
**Improving Mennonites in an Age of Revolution**

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**Voltaire's Anabaptist**

Anabaptism has a bit part in a memorable book by an author emblematic of the Enlightenment. In *Candide*, first published in 1759, Voltaire savages the stupidity, intolerance, vanity, and hypocrisy that everywhere confronts the novella's eponymous protagonist, who remains untainted by the sham and cruelty of the world. Early on in the novella, Candide, fleeing war, goes to Holland confident he will find charity in a place where everyone is described as "rich and a Christian." Instead, he finds bigotry and contempt – until he meets Jacques, a man "who had never been baptized," an Anabaptist. Jacques is characterized with unusual warmth, a person with a genuine concern for others without regard for their beliefs. He also shows good sense in telling the ever-optimistic Pangloss (he who thinks all that is, is for the best), that people are not born wolves but have "somehow corrupted Nature" to become them. A man the novella describes as good, honest, charitable, and virtuous is out of place in the world Candide inhabits: Jacques saves a man from drowning only to drown himself – Voltaire's allusion, it seems, to those early 16th-century authorities who considered drowning as the appropriate punishment for those who baptized adults.

Admired in life and pitied in death, Jacques is a worthy but not otherworldly figure. He lives by commerce and owns a "Persian-rug" factory (in which he offers Candide a job) – such rugs, the narrator remarks with characteristic wit, are widely manufactured in Holland.<sup>1</sup> Well-known for his deism, critical views of the Bible, and attacks on various kinds of organized

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<sup>1</sup> Voltaire, *Candide, or Optimism*, trans. Robert M. Adams, 2nd ed. (New York: Norton, 1991), 5-9.

religion, the author of *Candide* is as unlikely a witness for Anabaptism as the work itself, but having already made use of Pieter Langendijk's Mennonite satire in Lecture I, it will not do to exclude *Candide*. There is little reason to doubt that Voltaire admired "the good Anabaptist" he created; he may well have met Mennonites on his travels to Holland, where he had publishers in The Hague and Amsterdam.

Voltaire's favorable depiction of an Anabaptist raises a most interesting question: what did Mennonites have to do with the Enlightenment? Until recently such a question has scarcely been asked, much less addressed, in Anabaptist and Mennonite studies. No one should be surprised that Mennonites, with their history of moving from one place to another in order to preserve their expressions of faith, are not known for their enthusiasm for something with a decidedly this-worldly character. If I can be forgiven a generalization that is not meant to be disparaging, for a long time many Mennonites, not just those in North America, considered the Enlightenment as something to be endured, resisted or, in the last resort, fled. As historian Michael Driedger has argued, Mennonites tended to see themselves as acted upon by the Enlightenment rather than as actors in it. Recent years have witnessed something of a sea change in Mennonite studies – the fictional Jacques, it turns out, was not so unlikely a figure. There were Mennonites active in the Enlightenment, particularly in the Netherlands.<sup>2</sup> I would further argue that nowhere was Mennonite participation in the Dutch Enlightenment more evident than in the making, teaching, and promoting of natural knowledge, and that this participation is revealing of the tensions associated with assimilation into the Dutch mainstream and of the aspirations and anxieties of enlightened Dutch Mennonites.

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<sup>2</sup> Michael Driedger, "An Article Missing from the Mennonite Encyclopedia: 'The Enlightenment in the Netherlands,'" in *Commoners and Community: Essays in Honour of Werner O. Packull*, ed. C. Arnold Snyder (Kitchener: Pandora Press, 2002), 101-20. See also Keith L. Sprunger, "Frans Houத்துyn, Amsterdam Bookseller: Preaching, Publishing and the Mennonite Enlightenment," *Mennonite Quarterly Review* 78 (2004): 165-84; Piet Visser, "Enlightened Dutch Mennonitism: The Case of Cornelius van Engelen," in *Grenzen des Täufertums/Boundaries of Anabaptism: Neue Forschungen*, ed. Anselm Schubert, Astrid von Schlachta, and Michael Driedger (Göttingen: Gütersloher Verlagshaus, 2009), 369-91; and Jelle Bosma, *Woorden van een gezond verstand: De invloed van de verlichting op de in het Nederlands uitgegeven preken van 1750 tot 1800* (Nieuwkoop: De Graaf, 1997).

### **Mennonites Get Enlightenment**

Ever since Immanuel Kant declared that his was not an enlightened age, “but an age of Enlightenment,” the very idea of Enlightenment has been a much-contested concept, one that can be applied only retrospectively for most of the period in question.<sup>3</sup> It has been treated as a unified philosophical movement reliant on a method of thinking derived from Isaac Newton’s rules of philosophizing; a movement of the *philosophes* (Voltaire and company) characterized by a style of thinking that drew upon classical antiquity and was directed against Christianity; a radical, materialist movement that began with Spinoza in the 17th-century Netherlands and eventually spread across Europe in the 18th century.<sup>4</sup> There is also a long history of finding in the Enlightenment the origins of the political contours of the modern world, of attributing to it everything from 20th-century totalitarianism to liberal democracy and human rights. There has also been much work that treats the Enlightenment not as a unitary phenomenon but as a movement that expressed itself very differently in different places.<sup>5</sup> In the case of the Netherlands, particularly the province of Holland, we can go further and say there were different versions of Enlightenment in the same place, with a distinctly radical strain that reached well back into the 17th century,

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<sup>3</sup> Immanuel Kant, “Beantwortung der Frage: Was ist Aufklärung?” *Berlinische Monatsschrift*, December 1784, 481-94, 491. Translations are my own unless otherwise indicated. I will, for the purposes of this lecture, take it as more or less unproblematic to apply the word “Enlightenment” to pre-Kantian historical actors.

<sup>4</sup> See, respectively: Ernst Cassirer, *The Philosophy of the Enlightenment*, [1932] trans. Fritz C. A. Koelln and James P. Pettegrove (Princeton: Princeton Univ. Press, 1951); Peter Gay, *The Enlightenment: An Interpretation*, 2 vols. (New York: Alfred A. Knopf, 1966-69); Jonathan Israel, *Radical Enlightenment: Philosophy and the Making of Modernity, 1650-1750* (Oxford: Oxford Univ. Press, 2001).

<sup>5</sup> See Max Horkheimer and Theodor Adorno, *Dialectic of Enlightenment: Philosophical Fragments*, [1944] trans. Edmund Jephcott (Stanford: Stanford Univ. Press, 2002); and, in contrast, Jonathan Israel, *A Revolution of the Mind: Radical Enlightenment and the Intellectual Origins of Modern Democracy* (Princeton: Princeton Univ. Press, 2010). On kinds of Enlightenment see Roy Porter and Mikuláš Teich, eds., *The Enlightenment in National Context* (Cambridge: Cambridge Univ. Press, 1981). Recent years have seen much work to show that religion continued to play an important part in the Enlightenment; see Jonathan Sheehan, “Enlightenment, Religion, and the Enigma of Secularization: A Review Essay,” *American Historical Review* 108 (2003): 1061-80, and Jeffrey R. Collins, “Redeeming the Enlightenment: New Histories of Religious Toleration,” *Journal of Modern History* 81 (2009): 607-36.

and a more predominant moderate Enlightenment that was urban, non-aristocratic, and commercially oriented, and that emphasized tolerance in matters of religion, pragmatism in politics, and utility in most things.<sup>6</sup> It was in this moderate stream of the Dutch Enlightenment that Mennonites were most active, though there is also evidence of Mennonite involvement in radical Enlightenment.

What did Mennonite Enlightenment look like? In Lecture I we saw one prominent example with the cabinet of Levinus Vincent. Let us now consider another example, also from Amsterdam in the winter of 1717-18, by which time Vincent had moved to Haarlem and some five years after the publication of Langendijk's "Swiss Simplicity." It was in 1717-18 that the German-Polish-Dutch instrument maker and natural philosopher Daniel Gabriel Fahrenheit (1686-1736) gave instruction in experimental philosophy (*proefkundige wijsbegeerte* or *proefkundige natuurkunde*) to a group of Mennonites. Fahrenheit, best known for his improvements to the thermometer and for the temperature scale named after him, had recently moved to Holland from Danzig (now Gdansk), the city of his birth. Experimental philosophy, a practice that began in Britain and soon spread to the Netherlands, aimed at demonstrating natural philosophical principles through the ingenious and sometimes spectacular use of mechanical instruments.<sup>7</sup> Mennonite enthusiasm for experimental philosophy was at the

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<sup>6</sup> The discussion of radical and moderate Enlightenments has very much revolved around Jonathan Israel's *Radical Enlightenment* and his *Enlightenment Contested: Philosophy, Modernity, and the Emancipation of Man 1670-1752* (Oxford: Oxford Univ. Press, 2006). For an earlier treatment of Dutch radical Enlightenment, see Margaret C. Jacob, *The Radical Enlightenment: Pantheists, Freemasons and Republicans* (London: George Allen and Unwin, 1981) and *idem*, "Radicalism in the Dutch Enlightenment," in *The Dutch Republic in the Eighteenth Century: Decline, Enlightenment, and Revolution*, ed. Margaret C. Jacob and Wijnand W. Mijnhardt (Ithaca: Cornell University Press, 1992), 224-40. On moderate Enlightenment see Wijnand W. Mijnhardt, "The Dutch Enlightenment: Humanism, Nationalism, and Decline," in *The Dutch Republic in the Eighteenth Century*, 197-223. For a brief overview and an insightful analysis of the contribution of the Dutch urban context to the Enlightenment, radical and otherwise, see *idem*, "Urbanization, Culture and the Dutch Origins of the European Enlightenment," *BMGN - Low Countries Historical Review* 125, 2-3 (2010): 141-77.

<sup>7</sup> On Fahrenheit see Ernst Cohen and W.A.T. Cohen de Meester, "Daniel Gabriel Fahrenheit (geb. Danzig 24. Mai 1686; gest. im Haag 16. Sept. 1736)," *Verhandelingen der Koninklijke Akademie van Wetenschappen te Amsterdam, Afdeling Natuurkunde* (Eerste sectie), Deel xvi, no. 2 (1936), and Pieter van der Star, ed., *Fahrenheit's Letters to Leibniz and Boerhaave*

leading edge of an enthusiasm for the subject that cut across the social strata of the 18th-century Netherlands. By 1735 a Dutch observer could write:

Everywhere [in the Dutch Republic] societies are founded, in which people deliberate on physics and perform experiments. Several extraordinary persons take great pains in collecting many and costly apparatuses; they regale their friends less with appetizing spices and liquor, than with a series of physical observations. There is a kind of envy among the common people. Everyone seeks to be a connoisseur of natural philosophy. The merchant leaves his desk to work with the air pump, and does not hesitate to work himself up into a sweat on the composition of some apparatus. The artisan rests from his work to set himself to these things in which he takes far more pleasure. Yes, if one would believe it, even farmers whom one would take to be examples of stupidity, are practicing mathematics and are trying to become natural philosophers.<sup>8</sup>

This was Dutch Enlightenment (leaving aside the uncalled-for attack on farmers), and Mennonites were at its forefront.

The lectures given by Fahrenheit should not be construed as mere after-dinner amusement. They amounted to a serious course on experimental philosophy taught by a highly skilled instrument maker who had just spent a decade (1707-17) travelling to Berlin, Halle, Leipzig, Dresden, and Copenhagen in pursuit of his craft and its implications for natural philosophy. During his travels he worked with a number of outstanding instrument makers and scholars, including astronomer Olof Römer and natural philosopher Christian Wolf. He also corresponded with Leibniz, and earned the respect of the distinguished physician and natural philosopher

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(Amsterdam: Rodopi, 1983), which includes letters to Boerhaave that mention the lectures to Mennonites, dated 18 [no month] 1720, 104, and a reference to “difficult lectures” he started in the winter of 1728-1729, dated 20 March 1729, 120. On experimental philosophy see Larry Stewart, *The Rise of Public Science: Rhetoric, Technology, and Natural Philosophy in Newtonian Britain, 1660-1750* (Cambridge: Cambridge Univ. Press, 1992), esp. 101-41.

<sup>8</sup> Jan Wagenaar, cited in Huib Zuidervaart, “A Plague to the Learned World: Pieter Gabry, F.R.S. (1715-1770) and His Use of Natural Philosophy to Gain Prestige and Social Status,” *History of Science* 45 (2007): 287-326, 290, and 317, n13.

Herman Boerhaave as well as that of experimental philosophers Willem 's Gravesande (1688-1742) and Pieter van Musschenbroek (1692-1761), professor of mathematics, astronomy, and natural philosophy at Utrecht and later Leiden.<sup>9</sup>

A complete set of lecture notes dated 1718 and preserved in the Leiden University Library show that in 1717-18 Fahrenheit taught optics, hydraulics, hydrostatics, and chemistry, all standard subjects in demonstration lectures for experimental philosophy. A further sense of what he taught can be gleaned from a prospectus he prepared in 1721 to advertise his lectures. It lays out a schedule of demonstration lectures that would start in December 1721 and run through to March 1722. They were divided into two separate series, both held on Wednesdays. The first series of 15 lectures was held in the late afternoon and dealt mainly with hydrostatics and the related topics of air and its properties, barometers, and thermometers; the second series of 16 lectures was held on the same day in the early evening and dealt with optics.<sup>10</sup>

The textbook Fahrenheit set for these sessions, 's Gravesande's *Mathematical Elements of Natural Philosophy* (published originally in Latin in 1720-21), is a telling choice. The textbook's author had recently returned from a year-long sojourn in London, where he had immersed himself in natural philosophy. He attended sessions of the Royal Society and was elected to its membership, and he came to know its renowned demonstrator (the person who displayed experiments) John Theophilus Desaguliers and his patron Isaac Newton. There is no question that both men left a deep impression on 's Gravesande, who upon returning to the Netherlands took up a professorship in astronomy and mathematics at Leiden University, where he is said to have "formed a beach head on the Continent" for Newton's natural philosophy (as

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<sup>9</sup> See Cohen and Cohen de Meester, "Fahrenheit" and Van der Star, *Fahrenheit's Letters*.

<sup>10</sup> Daniel Gabriel Fahrenheit, "Natuurkundige Lessen over de Gezicht-Doorzicht-en Spiegelkunde; als mede over de Waterwieg-en Scheijkunde, in onderscheidene bijeenkomsten door hem afgehandeld," lecture notes taken in 1718 by Jacob Ploos van Amstel, Leiden University Special Collections, BPL 772. The Prospectus is reprinted in Cohen and Cohen de Meester, "Fahrenheit," 13-20. For standard subjects in demonstration lectures see G. I.E. Turner, "Eighteenth-Century Scientific Instruments and Their Makers," in *The Cambridge History of Science*, vol. 4, *Eighteenth-Century Science*, ed. Roy Porter (Cambridge: Cambridge Univ. Press, 2003), 511-35, at 521.

we shall see, Newton was already a topic of discussion in the Netherlands some time before that).<sup>11</sup> In *Mathematical Elements of Natural Philosophy*, 's Gravesande acknowledges that the challenge in learning mathematical demonstrations lies in their abstraction, which is why he prefers the method he learned in England, of using machines and “making the Experiments” that demonstrate natural philosophy “before one’s Eyes.” This was the very core of experimental philosophy: the use of machines and instruments to exemplify the otherwise obscure principles of Newtonian natural philosophy, and in a way that could appeal to an audience of what Fahrenheit called Mennonite “liefhebbers” (devotees or amateurs).<sup>12</sup>

Fahrenheit gave lectures in experimental philosophy at least until 1729, possibly to the end of his life in 1736. While there is no reason to assume that the lectures were exclusively aimed at Mennonites, it is true that Mennonites in Amsterdam were known to hold weekly lectures on some aspect of natural knowledge at least until 1759, and these lectures were described as having taken on an institutional character.<sup>13</sup>

Besides serving as an example of Mennonites doing experimental philosophy, Fahrenheit’s lectures reveal a number of other things about Mennonites, natural knowledge, and the Dutch Enlightenment. First, in terms of the big picture, there was nothing unusual about Mennonites in Dutch cities and towns, especially those places with sea access, having the opportunity to come into regular contact with widely travelled people having connections to other cultures, as did Fahrenheit. The Dutch Republic was a migrant and immigrant society. Between 1650 and 1800 its population is estimated to have been fairly stable at nearly two million. By the best estimates 500,000 immigrants, mostly from neighboring countries or from those along the North Sea, settled in the Republic between 1600 and 1800. To this number we must add, over the same period, another roughly 500,000

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<sup>11</sup> Albert van Helden, “Willem Jacob ’s Gravesande, 1688-1742,” in *A History of Science in the Netherlands: Survey, Themes and Reference*, ed. Klaas van Berkel et al. (Leiden: Brill, 1999), 450-53 at 450.

<sup>12</sup> Willem Jacob ’s Gravesande, *Mathematical Elements of Natural Philosophy Confirmed by Experiments, or an Introduction to Sir Isaac Newton’s philosophy*, trans. J. T. Desaguliers, (London, 1720), xvii-xviii. “Liefhebbers” in Van der Star, *Fahrenheit’s Letters*, 104.

<sup>13</sup> G.W. Kernkamp, “Bengt Ferrner’s dagboek van zijne reis door Nederland in 1759,” *Bijdragen en mededelingen van het historisch Genootschap* 31 (1910): 314-509, 335-36, 356-57, 386.

transmigrants, those from elsewhere who sojourned in the Republic while on their way to other places, usually the East or West Indies. In addition to this, after 1650 there were about 30,000 seasonal migrants, mostly German, who came to the Republic every year to work in the merchant marine, whaling, linen bleaching, and agriculture.<sup>14</sup> The exchange of ideas, people, and things that was characteristic of the cosmopolitanism of the Golden Age carried on long after Dutch domination of world trade had come to an end; religious, cultural, and linguistic diversity were part and parcel of Dutch urban life, and of the Enlightenment.<sup>15</sup>

Fahrenheit's lectures are also a reminder that while there are surely distinctions to be drawn between the Golden Age and the Enlightenment in the Netherlands, they should not be overdrawn. The Vincent cabinet was as much a part of the early Enlightenment as were Fahrenheit's lectures; experimental philosophy and cabinets did for a time flourish alongside one another. Or even as a part of one another, for cabinets of instruments used in experimental philosophy could be a part of larger, more general cabinets such as Vincent's. For example, the cabinet assembled by Anthony Bierens (d. 1738), a Mennonite silk merchant in Amsterdam, had as its highlight a substantial collection of instruments.<sup>16</sup> Vincent's cabinet reflected the kind of knowledge making connected with Dutch commercial empire reaching back into the 16th and 17th centuries. Experimental philosophy likewise built on longer traditions, and some of its roots were in craft and artisanal knowledge. The notes of Fahrenheit's lectures show that in 1718 he still included alchemy in his treatment of chemistry – as was standard practice in the early 18th century – a science deeply connected to crafts and practical arts. Fahrenheit's prospectus for his 1721-22 lectures no longer included any chemistry at all, and hence no alchemy.

That said, experimental philosophy as presented to Mennonites was

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<sup>14</sup> Jan de Vries and Ad van der Woude, *The First Modern Economy: Success, Failure, and Perseverance of the Dutch Economy, 1500-1815* (Cambridge: Cambridge Univ. Press, 1997), 72.

<sup>15</sup> On religious diversity and the Dutch Enlightenment see Lynn Hunt, Margaret C. Jacob, and Wijnandt Mijnhardt, *The Book that Changed Europe: Picart and Bernard's Religious Ceremonies of the World* (Cambridge: The Belknap Press, 2010).

<sup>16</sup> J. A. Bierens de Haan, "Het huis van een 18e eeuwse 'Mercator Sapiens,'" *Jaarboek van het Genootschap Amstelodamum* 49 (1957): 110-28.

characterized more by novelty than by tradition, built as it was on the very latest natural philosophy of Newton and 's Gravesande. What is more, its strong technological component, evident in how it employed instruments and machines, could appeal to merchants and others looking for ways to enhance commercial activity.<sup>17</sup> And improvement was important, for by the early 18th century the salient feature of the Golden Age – Dutch control of world trade – was no more. The Dutch Republic in the Enlightenment was still a dynamic place, but its strength relative to the much larger nations of England and France had declined.

This decline was a long time coming and rooted in a series of costly wars, as Mennonites well knew. In 1672 the Republic suffered what has become known as its *rampjaar* or “year of disaster,” fighting the French under Louis XIV and his allies Münster and Cologne on land and the English at sea. The usual sources of money having dried up, Mennonites in Friesland offered the powers that be favorable financing – in exchange for full tolerance in Friesland – so that the Republic might survive. Ironically, it was the great victory of 1688, when a Dutch armada of 400 ships (more than twice the size of Spanish armada), including 53 warships and over 21,000 well-trained soldiers, invaded England, occupied London, and installed William III to reign jointly with his wife Mary II, that helped undo the Golden Age. The Dutch victory, described in the Anglo-Saxon world as the Glorious Revolution, left the Republic deeply indebted. Joint rule of England may have boosted Dutch pride, but Britannia alone ruled the 18th-century waves. Amsterdam continued to be the financial center of Europe until 1800, but the Dutch economy had reached a plateau by the early 18th century. That the Dutch economy was still a force to be reckoned with was in no small part due to its technological prowess. It takes only a very small step to see a connection between the enthusiasm that Mennonites showed for experimental philosophy and the larger challenges facing the Dutch economy in the Enlightenment.<sup>18</sup>

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<sup>17</sup> For the entrepreneurial relations of experimental philosophy see Margaret C. Jacob and Larry Stewart, *Practical Matter: Newton's Science in the Service of Industry and Empire, 1687-1851* (Cambridge: Harvard Univ. Press, 2004) and Stewart, *The Rise of Public Science*.

<sup>18</sup> On Mennonites in Friesland and the Dutch armada, see Jonathan Israel, *The Dutch Republic: Its Rise, Greatness, and Fall, 1477-1806* (Oxford: Clarendon Press, 1995), 645 and 849-52. On the economy see De Vries and Van der Woude, *The First Modern Economy*, 681-83, who note

Moving from the big picture to the local context, it is clear that the Mennonites who attended Fahrenheit's lectures were undoubtedly of a middling or higher income, and would have included merchants, manufacturers, almost certainly some physicians and very probably some preachers (many Mennonite preachers made a living as physicians, others as merchants). There was little likelihood of attracting a significant number of laborers or even skilled tradesmen. The 22 stuivers (1.1 guilders) fee for each lecture was roughly equivalent to the daily wage of a journeyman mason or carpenter; the day's wage of a master of those trades would have barely covered the slightly higher 27.5 stuivers fee for each of the four lectures requiring more expensive demonstration materials. Even if a prosperous mason, say, could have found the money, attending the full set of hydrostatics lectures would have cut into his earning power, since they began at 3 PM, still part of the shorter winter workday. Fahrenheit did design the course so that anyone could attend as many or as few lectures as they wished, so perhaps tradespeople might have occasionally attended. We have already seen that some people of humble background could afford the two guilders "gratuity" required to view the Vincent cabinet. Attending the complete run of the lectures in hydrostatics and optics would have cost 35.2 guilders, not an exorbitant sum but a salient reminder that experimental philosophy, while not restricted to the wealthy, did require significant resources.<sup>19</sup>

The more pressing and most immediately local question is one that the lectures themselves, at least in the record we have of them, do not answer directly: why were Mennonites attending such lectures and why did they maintain a tradition in Amsterdam, if not elsewhere, of weekly lectures in some aspect of natural knowledge through much of the 18th century? Part of the answer must lie in the strong inclination to useful knowledge found

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that the Dutch debt was made even worse by the War of Spanish Succession (1702-13); see also 118-19.

<sup>19</sup> On lecture fees see Cohen and Cohen de Meester, "Fahrenheit," 13-20, esp. 20, and a miscalculation of the fees on 13 and another one on the part of Van der Star, *Fahrenheit's Letters*, 9-10. On wages see De Vries and Van der Woude, *The First Modern Economy*, 610-11 and 615. Albrecht von Haller, then a medical student, complained that visitors to the Vincent cabinet had to pay a tip of at least 2 guilders: Albrecht von Haller, *Haller in Holland: Het dagboek van Albrecht van Haller van zijn verblijf in Holland (1725-1727)*, ed. G. A. Lindeboom (Amsterdam: Rodopi, 1979), 90.

among Mennonites as diverse as Dirk Rembrandtsz. van Nierop and Levinus Vincent. In a place with a centuries-long tradition – and that was already true in the early 18th century – of drainage, land reclamation, and water management more generally, we would expect to see an interest in learning the principles underlying “suction and pressure pumps, spouts, siphons, artificial fountains [and] waterworks,” to name some of the areas covered in Fahrenheit’s lectures, especially among merchants and manufacturers keenly aware of the advantages that technology can afford.<sup>20</sup> I do not wish to suggest that these lectures, or experimental philosophy in general, amounted to a “how to” manual for technological invention, but they did intertwine a notion of natural philosophical principles with machinery in such a way that made the two more or less inseparable. As we have already seen, the close link between mechanical ways of thinking and doing was already becoming apparent to Descartes when he was living in the Zaandam, more than half a century earlier.

Experimental philosophy, even when largely free of explicit theological content as in the case of Fahrenheit, could, by virtue of explaining the regularities of nature and how they might be harnessed in the service of human industry, carry an implicit theological message about the providential arrangement of the world. It could also do more than that. Consider Adriaan Verwer (c.1655-1717), a merchant who came from a Mennonite family in Rotterdam and settled in Amsterdam in 1680, was baptized nine years later in the Church *bij het Lam en de Toren*, and was “among the first in the Republic to study the work of Newton.” Described as a “pivotal figure in the informal but lively intellectual life of the city,” Verwer wrote works on maritime law, the history of language, Christian theology, and philosophy, and was the center of a circle of figures who introduced Newtonian philosophy to Amsterdam.<sup>21</sup>

One of those citizens of the republic of letters at ease with academics and amateurs, Verwer can serve as an outstanding example of a Mennonite

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<sup>20</sup> Fahrenheit, “Natuurkundige Lessen,” 99.

<sup>21</sup> Verwer as “among the first ...” in Michiel Wielema, “Adriaan Verwer,” *Dictionary of Seventeenth- and Eighteenth-Century Dutch Philosophers*, 2 vols., ed. Wiep van Bunge et al. (Bristol: Thoemmes, 2003) II, 1026-28, 1026f; “pivotal figure ...” in Rienk Vermij, “The Formation of the Newtonian Philosophy: The Case of the Amsterdam Mathematical Amateurs,” *British Journal for the History of Science* 36 (2003): 183-200, 187.

Enlightener. Liberal in terms of religion, his circle included members of the Reformed Church and Mennonites; most notable among the former was the natural philosopher Bernard Nieuwentijt; outstanding among the latter was Lambert ten Kate (1674-1731). Baptized in 1706 in the same church as Verwer, ten Kate was of independent means (he came from a prosperous merchant family) and devoted himself to scholarship, above all his *Introduction to the Exalted Parts of the Dutch Language* (1723), a massive and important work in historical linguistics. In 1716 Ten Kate published a lengthy introduction to, and a Dutch translation of, a book by a Scottish physician and Newtonian, George Cheyne's *Philosophical Principles of Natural Religion*, giving it a title that delineated the theological importance of natural philosophy: *The Creator and His Government, Known in His Creatures, Following the Light of Reason and Mathematics: For Building Up Respectful Religion, and the Destruction of all Basis of Atheism . . .* Historian of science Rienk Vermij has shown that Verwer and his group saw their Newtonian philosophy as a bulwark against Spinozistic atheism. Given that Collegiants (among whom were many Mennonites) had many associations with Spinoza, Verwer and Ten Kate may have considered it a matter of some urgency to make Newtonian natural philosophy more widely known, especially to those of their own faith.<sup>22</sup> Fahrenheit's arrival in Amsterdam in 1717 may have offered the opportunity to counter Spinozism with the visibly demonstrable principles of experimental philosophy. Whether or not it was Mennonites who sought out Fahrenheit or he them, the notion that natural knowledge – “the light of reason and mathematics” – could settle

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<sup>22</sup> J. Noordegraaf, “Lambert ten Kate,” *Dictionary of Seventeenth- and Eighteenth-Century Dutch Philosophers*, II, 553-56. On Verwer and Spinozism see Vermij, “The Formation of the Newtonian Philosophy,” 189-200. On Mennonite connections to Spinoza see: Leszek Kolakowski, “Dutch Seventeenth-Century Anticonfessional Ideas and Rational Religion: The Mennonite, Collegiant and Spinozan Connections,” [1963] trans. and intro. James Satterwhite, *Mennonite Quarterly Review* 64 (1990): 259-97 and 385-416; Piet Visser, “‘Blasphemous and Pernicious’: The Role of Printers and Booksellers in the Spread of Dissident Religious and Philosophical Ideas in the Netherlands in the Second Half of the Seventeenth Century,” *Quaerendo* 26 (1996): 303-26; Andrew Fix, *Prophecy and Reason: The Dutch Collegiants in the Early Enlightenment* (Princeton: Princeton Univ. Press, 1991); Michael Driedger, “Response to Graeme Hunter: Spinoza and the Boundary Zones of Religious Interaction,” *The Conrad Grebel Review* 25. 3 (Fall 2007): 21-28, part of an issue entitled *Spinoza as Religious Philosopher: Between Radical Protestantism and Jewishness*.

a theological matter shows how deeply some Mennonites were engaged in Enlightenment thinking, and helps us better understand why Mennonites attended lectures in experimental philosophy and related subjects through much of the 18th century.<sup>23</sup>

Finally, we should not underestimate the social utility of natural knowledge for those Mennonites looking to move into the mainstream of Dutch bourgeois life. As we have already observed, the Vincent cabinet was as much a display of the glory of God's handiwork as of the taste and wealth of Levinus and Johanna Vincent. Conversely, it could only have helped the fortunes of Fahrenheit and his lectures to have wealthy and perhaps well-known Mennonites among his audience. The relationship between the lecturer and pupils was symbiotic; both benefited. In the 1739 edition of his textbook on natural philosophy, Pieter van Musschenbroek wrote that the subject was "blossoming" as never before in the United Netherlands. It had a following among amateurs, scholars, prominent merchants, and "people of all ranks and dignities," but he dedicated his book not to the numberless and nameless many but to the wealthy Mennonite silk merchant and manufacturer David van Mollem (1670-1746).<sup>24</sup>

Van Mollem can be taken as a representative of enlightened, entrepreneurial Mennonitism that had become part of Dutch elite culture. His renown stemmed not from any contribution to experimental philosophy but from the spectacular gardens of his estate Zijdebalen on the Vecht River, a stretch of which was known as "Mennonite heaven" due to the Mennonite

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<sup>23</sup> It may have been Fahrenheit who sought out his Mennonite audience. Raised in a prosperous merchant family in Danzig, he would have known about Mennonites since childhood and would likely have had many interactions with them after moving to Amsterdam, where he was sent at age 14 to learn the details of running a business by working in a trading firm. Cohen and Cohen de Meester suggest that the firm for which he worked was located on the Singel, the canal that was home to several prominent Mennonite congregations at that time, most notably the *bij het Lam en de Toren* and Zonist churches. Fahrenheit had little enthusiasm for business but much for natural knowledge, and his association with Mennonites of similar interests may have predated his 1707 departure from Amsterdam, when he began his decade-long apprenticeship in experimental philosophy and instrument making. Cohen and Cohen de Meester, "Fahrenheit," 4-6.

<sup>24</sup> Petrus van Musschenbroek, *Beginsels der Natuurkunde, beschreven ten dienste der Landgenoten*, 2nd ed. (Leiden, 1739), preface, translation, and citation from Zuidervaart, "Plague to the Learned World," 289 and 317, n11.

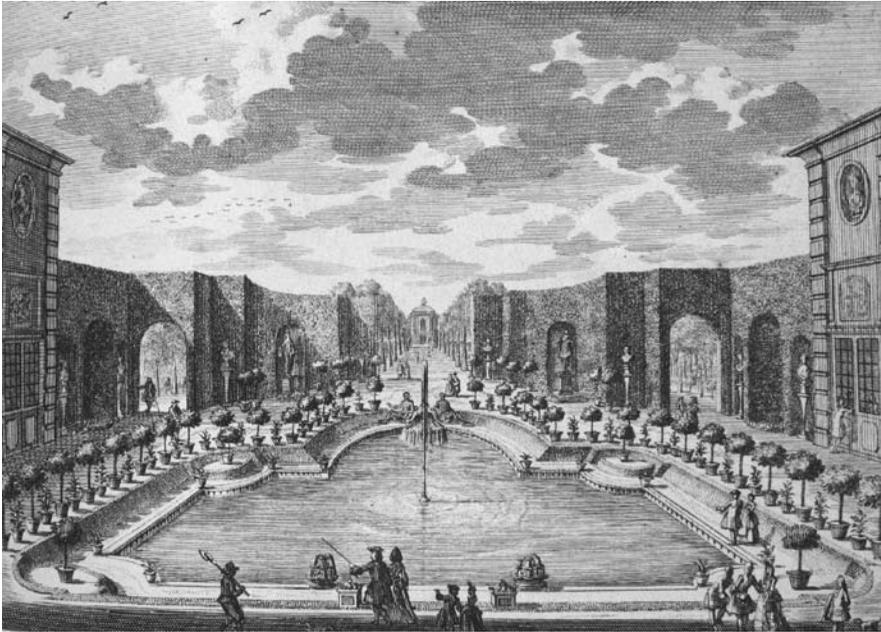


Figure 4. Zijdebalen, the estate of David van Mollem, looking out from the residence onto the garden. The wing of the residence visible on the far left housed the silk factory; the wing visible on the far right was the orangery. Engraving by Daniel Stoopendaal in *Zegepraalende Vecht*. (Amsterdam: Nicholaus Visscher, 1719). University of Amsterdam Library.

owned estates lining its banks. The elaborate waterworks of Zijdebalen (silk bales) drove the silk mill that generated wealth for Van Mollem, powered the many fountains of his estate, and provided the water for the innumerable plants of his large garden and orangery (Fig. 4). Van Mollem spent many years and likely a significant portion of his inherited income building his gardens, which were meant to inspire contemplation of the Creator and, not incidentally, reflect on the industriousness and virtue of Van Mollem himself.<sup>25</sup> The Mennonite enthusiasm for gardening has clear connections

<sup>25</sup> On Van Mollem see Erik de Jong, *Nature and Art: Dutch Gardens and Landscape Architecture, 1650-1740*, trans. Ann Langenakens (Philadelphia: Univ. of Pennsylvania Press, 2000), 98-121. On technology and Dutch landscape see Lissa Roberts, "An Arcadian Apparatus: The Introduction of the Steam Engine into the Dutch Landscape," *Technology and Culture* 45 (2004): 251-76.

with agriculture, but also with commerce, for Mennonites were deeply involved in the famed tulip speculation of the 1630s, as is evidenced by the dense web of family connections that tied together Mennonite tulip traders in Haarlem, Amsterdam, Utrecht, and Rotterdam.<sup>26</sup>

Gardening was not only linked to agriculture and trade, it had close connections with natural knowledge, as in the case of Agneta Block (1629-1704), the owner of an estate on the Vecht and the designer of its gardens. Block kept up a learned botanical correspondence with the Bolognese professor Lelio Trionfetti, and exchanged specimens with Trionfetti, the Parisian professor Joseph Pitton de Tournefort, and Paulus Hermann, director of the Leiden botanical gardens. For her, as with Van Mollem later, gardening was a virtuous endeavor that drew attention to the providential arrangement of nature – in so doing it also offered a moral justification for estate ownership.<sup>27</sup> The ways in which knowledge could be useful for Enlightenment Mennonites extended very far beyond a simple economic utility and into the social and moral realms.

### **Books, a Seminary, and Societies**

It will not do to leave the impression that Enlightenment and natural knowledge were the preserve of rich Mennonites. Many Mennonites were active as authors, publishers, printers, and booksellers, central activities in the Dutch Enlightenment, and natural knowledge was a significant part of their stock-in-trade. Enlightenment ideals were also evident in the Lamist Mennonite Seminary in Amsterdam, an 18th-century institution that included a very significant component of natural philosophy in its curriculum. While it never hurts to come from a moneyed family if one wants to make a living as author and publisher, or to enter a seminary and take up a life as a Mennonite minister, these were not careers noted for attracting the wealthy or those who wanted to become so. While Enlightenment natural knowledge could be allied with high or climbing social status, it was also linked to the

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<sup>26</sup> On Mennonite family connections in the tulip trade see Anne Goldgar, *Tulipmania: Money, Honor, and Knowledge in the Dutch Golden Age* (Chicago: Univ. of Chicago Press, 2007), 149-53, esp. fig. 35. On wealth see Mary S. Sprunger, "Why the Rich Got Mennonite: Church Membership, Status and Wealth in the Dutch Golden Age," *Journal of Mennonite Studies* 27 (2009): 41-60.

<sup>27</sup> For Block see De Jong, *Nature and Art*, 108-10.

improving zeal that many Mennonites shared with other Dutch citizens, a zeal that was in no small part fired by a concern with enhancing the fortunes of the Republic. How natural knowledge was enrolled to improve Dutch society is especially evident in the numerous private societies that Mennonites founded, fostered, and were active members of. But before considering these societies, I will first turn to books and then to the seminary.

For a glimpse into the role of Dutch Mennonites in the 18th-century book world, a good starting point is *The Name List of Mennonite Authors and Books from 1539 to 1745*, a bibliography compiled by the redoubtable Marten Schagen (1700-70), translator, author, editor, publisher, bookseller, Mennonite preacher, and enthusiastic promoter of the ideals of moderate Enlightenment, including natural knowledge. The index of *The Name List* tallies 303 authors, by my count at least 19 of whom wrote books dealing directly with some aspect of natural knowledge. Some authors, such as Dirk Rembrandtsz. van Nierop, wrote many books on scientific topics, others but one or two. The number of authors included in the bibliography who wrote books addressing some aspect of natural knowledge may be considerably higher, for in many instances I was guided by little more than a book's title. There are omissions, of course, for there is no such thing as a complete bibliography, but it is surprising to find that the name Levinus Vincent has no entry in this book. The brief Preface to the bibliography shows Schagen at once anxious to dispel the notion still prevalent in some quarters that Mennonites were "a lowly and unlettered heap" and very proud that Mennonites had made their mark in the learned world, earning "no small place in the propagation of Godly and human knowledge."<sup>28</sup> Schagen was very conscious of where Mennonites might stand in Dutch society, for he belonged to the not insignificant number of them who had to make their mark in the world, not with the benefit of formal higher education or inherited wealth but by vast quantities of hard work, firm convictions, and whatever natural abilities they were blessed with. He was eager to show that

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<sup>28</sup> Quotation from the Preface of Marten Schagen, *Naamlyst der Doopsgezinde schryver en schriften, beginnende met den jaare 1539, en eindigende met den jaare 1745* (Amsterdam: J. Hartig, 1745). The University of Amsterdam Library owns a copy with many handwritten additions (call number OK 65-1201), presumably made by Schagen himself. Vincent's name is absent in both the printed text and the additions.

Mennonite learning was deep, broad, and richly worthy of respect.

Schagen made up for his brief formal education, having had to drop out of Latin school when his father died, by choosing a tried and true path for those who loved learning but did not have the means to pursue it at university: he apprenticed in a bookstore. Having found a way to surround himself with books, he then took every opportunity to learn theology, languages, and history, among other subjects. Baptized in the “Old Frisian” Mennonite church in 1718, he moved in that same year to Amsterdam, where he continued in the book business, married, opened his own bookstore (called “In Erasmus”), and in 1727 became a preacher in the *Arke Noach* Church. He authored no less than 18 theological or historical books or tracts, and there were many more that he edited, published, and translated – from English, French, German, Latin, Greek, and Italian. His single most notable translation was the collected works of Flavius Josephus, based on a new Greek and Latin edition published in Leiden, a project he undertook with two other Mennonites, Adriaan Loosjes (1689-1767) and Jan Lijnsz Rogge (d. 1759). But his most important contribution to Enlightened Dutch publishing was the quarterly journal he edited and published: *Theological, Historical, Philosophical, Natural Philosophical, Medical, Geographical, Poetic and Juristic Diversions, or Superior Selections on all Various Subjects: The Latest and the Best of Foreign Writers, Brought to Light for the Common Good*.

Schagen “edited” this journal from 1732 to 1740, which meant he made the lion’s share of the selections and translations, including nearly 90 percent of those dealing with natural philosophy, medicine, and geography. The Old Frisians are often described as more theologically conservative than Lamist Mennonites, but Schagen’s journal, a sort of high-powered *Reader’s Digest*, show him to be fully representative of Enlightened Dutch Mennonitism. Indeed, he was a leader in introducing many foreign authors to a wider Dutch reading public that may have been considerable, given the importance of books in Amsterdam, a city peppered with bookstores. At far less than half the population of Paris, Amsterdam had almost as many bookstores. The overall Dutch literacy rate had been higher than in neighboring countries since at least the 16th century, and the literacy rate in the many cities of the Dutch Republic, a nation more urbanized even than England of the Industrial Revolution, tended to be slightly higher than in rural areas. To be sure, Schagen did not give up editing his journal because it lacked

a readership but because he became a full-time minister in 1738, first in Alkmaar and in 1741 in Utrecht.<sup>29</sup>

The Frontispiece of the first number of the *Theological . . . Diversions* offers a rich representation of the ways reason could serve for a better understanding of the gospel (Fig. 5). At the center of the engraving, made by the noted Dutch engraver Jan Caspar Philips, a woman sits on a throne with a book entitled “Gospel” (*Evangelie*) open on her lap. To her right stands a

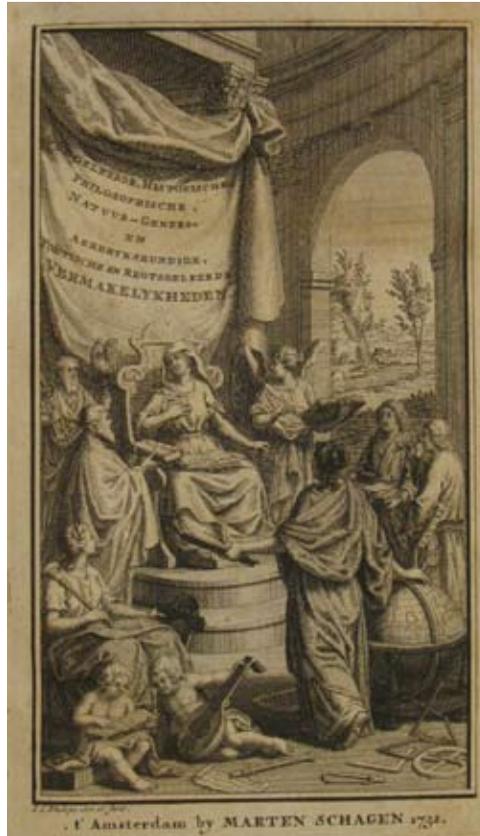


Figure 5. Frontispiece of *Godgeleerde, Historische, Philosophische, Natuur-Genees-en Aerdryks-kundige, Poëtische en Regtgeleerde Vermakelykheden . . .*, edited and published by Marten Schagen, 1732, Number 1, engraving by Jan Caspar Philips. University of Amsterdam Library.

<sup>29</sup> On Schagen’s life, education, business and intellectual activities, including many details of his editorial work on *Godgeleerde, historische, philosophische, natuur-genees-en aerdrykskundige, poëtische en regtsgeleerde vermakelykheden...*, see Piet Visser, “Redelyke regtzinnigheid: Prolegomena over de betekenis van Marten Schagen (1700-1770) voor de Nederlandse Verlichting,” in *Balanceren op de smalle weg*, ed. Lies Brussee-van der Zee et al. (Zoetermeer: Uitgeverij Boekencentrum, 2002), 216-84. On bookstores see Jeremy Popkin, “Print Culture in the Netherlands on the Eve of the Revolution,” in *Dutch Republic in the Eighteenth Century*, 273-91 and 275. On urbanization, De Vries and Van der Woude, *The First Modern Economy*, 57-71. As for literacy, in 1780 Amsterdam as many as 85 percent of bridegrooms and 60 percent of brides could sign their own names, a rate slightly higher than in rural areas: De Vries and Van der Woude, *The First Modern Economy*, 314, 170, and Israel, *Dutch Republic*, 686-90. Cornelis van Engelen, Mennonite editor of the journal *De Denker*, gave a very optimistic estimate of his readership in 1774 as “several thousand”: cited in Sprunger, “Frans Houttuyn,” 177.

man in classical garb who hands her the book of philosophy (*Philosophia*), and close behind him is a personification of medical knowledge readily identifiable by his staff of Asclepius; to her left is an angelic scribe and two men, one of whom carries the book of nature (*Natura*) while peering through a handheld microscope. Before her stands a woman with her hand on a globe, and a protractor, a pair of calipers, compass, and other measuring instruments at her feet; before her on her right is a young woman and two putti with musical instruments and scores. Natural knowledge went hand in hand with the technical and musical arts, philosophy, and healing, all in service of the higher aims of Biblical religion.

The representation of the relationship between faith and reason portrayed in the frontispiece of *Theological ... Diversions* is expressed more prosaically by Schagen in his translation of Jean-Jacques Burlamaqui's *Principles of Natural Law*, a fundamental work of 18th-century political thought that went through many editions. Schagen prefaces his translation by announcing to his "countrymen" that a "knowledge of the foundations of natural law is of outstanding service to students of theology.... Our faith is reasonable." Knowledge of the natural order was thus in close proximity to understanding the political and legal order, for in both cases Schagen saw reason as a guide for enriching an understanding of revealed religion.<sup>30</sup>

*Theological ... Diversions* was hardly the only journal published by a Mennonite publisher. Probably the most important of these for informing its Dutch readers about the changing state of natural knowledge was *Selected Treatises from the Latest Works of European Scientific Societies and From Other Learned Men*, published in ten volumes from 1757 to 1765 by Frans Houttuyn (c. 1719-65), also a member of *Arke Noach* Church, where he served as a lay preacher from 1750 until his death. *Selected Treatises* was published in an annual volume of 600+ pages of essays drawn from English, French, Russian, German, and Italian societies. Subject matter ran across the full range of natural knowledge: astronomical, medical, botanical, mathematical, and technological essays were all there, and the list of authors included Albrecht Haller, Erasmus Darwin, John Smeaton, and Benjamin Franklin, among many more. These were not essays in "popular science," a concept

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<sup>30</sup> J.-J. Burlamaqui, *Beginsels van het natuurlyk regt*, trans. Marten Schagen (Haarlem: Jan Bosch, 1750), Preface: 3 verso and 4.

that can only be applied with distortion to anything before the 19th century, but informed essays being made available in Dutch for the first time.<sup>31</sup>

Frans Houttuyn's bookshop and publishing business advertised his attitude to natural knowledge through its name, "The Isaac Newton," and his publisher's device (emblem) showed a portrait of Newton over a sketch of a lumberyard resembling a stockade (a play on the name Houttuyn) and the motto *Aedificando floret*, which translates as "Let edification flourish" (Fig. 6). Frans was not the

only Houttuyn preoccupied with natural knowledge. His brother Martinus Houttuyn (1720-98) was a physician who made a significant contribution to Dutch learning with his *Natural History* (1761-85), a 37-volume work describing animals, plants, minerals, and birds according to the Linnean system of classification (and published by the Houttuyn firm).<sup>32</sup> Mennonite enthusiasm for Newton had long outlived Fahrenheit's lectures and had become a fixture of enlightened Mennonite culture and of the moderate Dutch Enlightenment.



Figure 6. Publisher's device of Martin Houttuyn, as it appears on the title page of Simeon Frederik Rues, *Tegenwoordige Staet der Doopsgezinden of Mennoniten in de Vereenigde Nederlanden; waeragter komt een berigt van de Rynsburgers or Collegianten*, trans. Marten Schagen, Amsterdam: F. Houttuyn, 1745. Milton Good Library, Conrad Grebel University College.

<sup>31</sup> On the definition of popular science see Bernard Lightman, *Victorian Popularizers of Science: Designing Nature for New Audiences* (Chicago: Univ. of Chicago Press, 2007), 9-13.

<sup>32</sup> On Frans Houttuyn see Sprunger, "Frans Houttuyn" and Anna E. C. Simoni, "Newton in the Timberyard: The Device of Frans Houttuyn, Amsterdam," *British Library Journal* 1 (1975): 84-89. Martinus Houttuyn, *Natuurlyke historie of uitvoerige beschryving van dieren, planten en mineralien, volgens het samenstel van den heer Linnaeus*, 37 vols. (Amsterdam: F. Houttuyn, 1761-85). For a discussion of Martinus Houttuyn's work see M. Boeseman and W. de Ligny, *Martinus Houttuyn (1720-1798) and His Contributions to the Natural Sciences, with Emphasis on Zoology* (Leiden: Nationaal Natuurhistorisch Museum, 2004).

At this point questions might arise about whether natural knowledge had become important for large numbers of Dutch Mennonites or was restricted to a relatively small group of people. After all, we do not know how many Mennonites were reading the publications of Schagen and Houttuyn who, being publishers, were quite happy to sell their wares to whomever wished to buy them. In all likelihood most of their customers came from the Reformed Church. However, to allay any doubts about how deeply a concern with natural knowledge had permeated the world of Dutch Mennonites, we need only consider the Mennonite Seminary in Amsterdam. The Seminary itself was a response to important changes taking place among Dutch Mennonites, who must have been acutely aware of the particular decline in numbers they were experiencing. The high point of their population was about 75,000 in the mid-17th century; by 1809 it had fallen to 30,000, a decrease from 5 percent to less than 2 percent of the Dutch population.<sup>33</sup> Faced with diminishing numbers and a gradual move away from lay to paid ministers, and lacking an outside source from which to draw preachers and teachers (the Catholics, Jews, and Lutherans of the Republic could, when necessary, look to other European countries for their leaders), Mennonites needed an institution to teach their ministers. Officially founded in 1735, though working in some unofficial form for years before that, the Mennonite Seminary served Mennonite churches throughout the Republic. It was fully funded by the Church *bij het Lam en de Toren*.

What does any of this have to do with natural knowledge? Not much, until 1761 when the Seminary, having decided it needed to teach something else besides theology, created a second professorship (part-time), this one in experimental philosophy (*proefkundige wijsbegeerte*)! Bearing in mind

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<sup>33</sup> Zijlstra estimates a population of 60-65,000 Mennonites at the end of the 17th century: Samme Zijlstra, *Om de ware gemeente en de oude gronden: Geschiedenis van de dopersen in de Nederlanden 1531-1675* (Hilversum: Leeuwarden, 2000), 431-32. Jonathan Israel gives 75,000 for 1640s as the high point, or 5 percent of the Republic; and just under 31,000 for 1809, or between 1.4 and 1.8 percent of the Kingdom of the Netherlands: Israel, 398 and 1029. See also S. Groenvald, "Doopsgezinden in tal en last: Nieuwe historische methoden en de getalsvermindering der Doopsgezinden, ca. 1700-ca. 1850," *Doopsgezinde Bijdragen*, new series 1 (1975): 81-110. On the geographical distribution of Mennonites see Hans Knippenberg, *De religieuze kaart van Nederland: omvang en geografische spreiding van de godsdienstige gezindten vanaf de Reformatie tot heden* (Assen: Van Gorcum, 1992), 51-54.

that the sole purpose of the institution was to train youths for preaching and ministering in Mennonite churches, a purpose reaffirmed on a number of occasions in Seminary documents from the 18th until well into the 19th century, this decision was unusual. Highly unusual, insofar as it was accompanied by a decision to build up a very substantial physical cabinet – a collection of scientific instruments – thanks to the support of 18 members of the Church *bij het Lam en de Toren*, who collectively donated 8,100 guilders for the purchase of the instruments. This was experimental philosophy in the tradition of Fahrenheit, supported by a collection of air pumps, magnets, electrical generators, Leiden jars, telescopes, microscopes, and optical instruments, as well as lathes and various other mechanical devices, that was large enough to be at home in a Dutch university. For a time the professor in this subject was Jan van Swinden, an outstanding figure in Dutch metrology and natural philosophy, a Newtonian but not a Mennonite.<sup>34</sup>

All this begs the obvious question: why did the Mennonite Seminary see the need for a collection? There is little evidence that physico-theology or natural theology per se had a prominent place in the Seminary. A study of the examinations written by seminarians in the 18th century shows only a handful of students took up physico-theological questions.<sup>35</sup> Catalogs of the Seminary

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<sup>34</sup> On the history of the seminary see J. Brüsewitz, “‘Tot de ankweek van leeraren.’ De predikantsopleidingen van de Doopsgezinden, ca. 1680-1811,” *Doopsgezinde Bijdragen*, new series 11 (1985): 11-43, and S. Müller, “Geschiedenis van het Onderwijs in de Theologie bij de Nederlandse Doopsgezinden,” *Jaarboekje voor de Doopsgezinde Gemeenten in de Nederlanden, over de Jaren 1840-1850*, 67-197 (Amsterdam: M. Schooneveld en zoon, 1850). On the instrument collection, Huib Zuidervaart, “‘Meest alle van best mahoniehout vervaardigd’: Het natuurfilosofisch instrumentenkabinet van de doopsgezinde kweekschool te Amsterdam,” 1761-1828,” *Gewina* 29 (2006): 81-112, reprinted in *Doopsgezinde Bijdragen*, new series 34 (2008): 63-103, and Ernst Hamm, “Mennonite Centres of Accumulation: Martyrs and Instruments,” in *Centres and Cycles of Accumulation in and Around the Netherlands during the Early Modern Period*, ed. Lissa Roberts (Berlin: LIT, 2011). The best record of the instruments is in their auction catalog, *Catalogus van eene uitmuntende verzameling optische, phijsische, mathematische en andere Instrumenten ... Al het welk verkocht zal worden op Dingsdag den 23sten December 1828 ...* (no pl., no publ., 1828), available in Amsterdam Stadsarchief, Archief van de Verenigde Doopsgezinde Gemeente van Amsterdam en haar voorgangers (ADA), inventaris 1376. On Swinden see Marijn van Hoorn, “Swinden, Jan Hendrik van (1746-1823),” *Dictionary of Seventeenth- and Eighteenth-Century Dutch Philosophers*, II, 968-72.

<sup>35</sup> H. J. De Wit, *Aantekeningen van het College tot de Ankweek van Leraren van de Doopsgezinde Gemeente bij het Lam en de Toren in Amsterdam, 1733-1811* (typescript, Eindhoven, 1997),

library show no entries for classics in 18th-century physico-theology such as J. F. Martinet's *Katechismus der Natuur*, but they abound with entries for the works of Newton, Leibniz, Buffon, 's Gravesande, Malebranche, Huyghens, Descartes, Hobbes, Mandeville, and Spinoza.<sup>36</sup> The Seminary's engagement with experimental philosophy is best understood along the same general lines as Mennonite participation in Fahrenheit's lectures on the subject. Teaching through instruments was an effective way of learning general principles about the workings of the world. Such principles were as useful for understanding the regularities God had inscribed in it – the theological element was there and did not need to be expressed directly – as they were for understanding how the world might be changed for the better. The same commitment to a moderate Enlightenment that drove Mennonite publisher-preachers such as Schagen and Houttuyn to spread the word on the latest contributions to natural knowledge was behind the Seminary's embrace of experimental philosophy. That these ideas did eventually filter their way through to Mennonite churches is evidenced by Mennonite catechisms of the second half of the 18th century, which show that Enlightenment ideals found expression in theological commitments to virtue, civic duty, reasonableness, and a knowledge of God through nature.<sup>37</sup>

As the century progressed, the need for changes in the Dutch economy became ever more pressing. When Fahrenheit started his lectures and the Vincents displayed their cabinet, the Netherlands “was still the world's technological showcase.” This was especially so in the town of Zaandam and the district surrounding the Zaan River of North Holland, a region where Mennonites made up 20 percent of the population and controlled most of the industry, which ranged from lumber, flour and paint mills to shipbuilding, whale oil, sail-making and rope-making – a region Jonathan Israel describes as “Europe's first real industrial zone.” In the 1720s, '30s and

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<sup>36</sup> I have consulted the handwritten catalogs of the library available in the ADA and *Catalogus van de Bibliotheek der Vereenigde Doopsgezinde Gemeente te Amsterdam* (Amsterdam: Frederik Muller, 1854).

<sup>37</sup> For catechisms see Alfred R. van Wijk, *Plicht tot leren & plichten leren: een onderzoek naar de ontwikkeling van de doperse geloofsopveiding in de Lage Landen (ca. 1540-1811), aan de hand van de in druk verschenen geloofspedagogische geschriften*, 2 vols. Doctoral dissertation, Free University of Amsterdam (Kampen: Kok, 2007), I, 410-14.

'40s Amsterdam's prosperity dipped; that of the Zaan region took a nosedive. These declines, together with the devastating bouts of cattle virus that hit the Netherlands in 1713-19, 1744-65 (primarily in Friesland) and 1768-86, must have been keenly felt by Mennonites.<sup>38</sup> The 1740s saw the rise of Dutch radicalism, culminating in the Orangist Revolution of 1747-51. Mennonites were among the radicals, including a Mennonite clergyman who led a meeting of 300 deputies of cities and county districts in Leeuwarden, the capital of Friesland, demanding freer trade and the abolition of tax farming, among other things. Part of the radical demand was the application of the findings of "scientific academies" to the problems of industry.<sup>39</sup>

Within the context of the Dutch Enlightenment, be it radical or moderate, economic improvement came as an integral part of the ultimate goal of moral improvement. Nowhere was this more evident than in the many independent societies founded by Dutch Mennonites. Some of these societies were concerned primarily with natural knowledge, such as Haarlem's *Natuurkundig College* (1737-88), which was dominated by Mennonite merchants and was aimed specifically at natural and experimental philosophy.<sup>40</sup> Others, such as The Patriotic Association for Shipping and Trade (*Vaderlandsche Maatschappij van Reederij en Koophandel*), founded in 1777 in the West Frisian town of Hoorn by Mennonite leader Cornelis Ris (1717-90), focused on improving Dutch trade. The most well-known society and the one leaving the largest impact was the Society for Public Welfare (*Maatschappij tot Nut van 't Algemeen*) founded in 1784 by the Utrecht Mennonite preacher Jan Nieuwenhuyzen and his physician son Martinus. "*Het Nut*," as it is sometimes called, was an 18th-century version of MCC that sought to improve literacy and educate the lower

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<sup>38</sup> For "technological showcase" and "industrial zone" see Israel, *Dutch Republic*, 998 and 999, and the discussion on 998-1000; on Mennonites in Zaandam see Nanne van der Zijpp, "Zaandam (Noord-Holland, Netherlands)," *Global Anabaptist Mennonite Encyclopedia Online*, [1959], <http://www.gameo.org/encyclopedia/contents/Z11.html>, accessed 8 June 2011; on cattle virus see Israel, *Dutch Republic*, 1004.

<sup>39</sup> Jan A.F. de Jongste, "The Restoration of the Orangist Regime in 1747: The Modernity of a 'Glorious Revolution,'" in *Dutch Republic in the Eighteenth Century*, 32-59, esp. 42-43 and 54-55.

<sup>40</sup> B. C. Sliggers shows that 12 of the 19 members of the college were Mennonites: "Honderd jaar natuurkundige amateurs te Haarlem," in *Een elektriserend geleerde, Martinus van Marum, 1750-1837*, ed. A. Wiechmann and L. C. Palm (Haarlem: Joh. Enschedé en Zonen, 1987), 67-102, esp. 97.

classes in virtue and Christian citizenship through founding public libraries and publishing school textbooks appropriate for that purpose. By the early 19th century the work of this society resulted in the revamping of the Dutch educational system.<sup>41</sup>

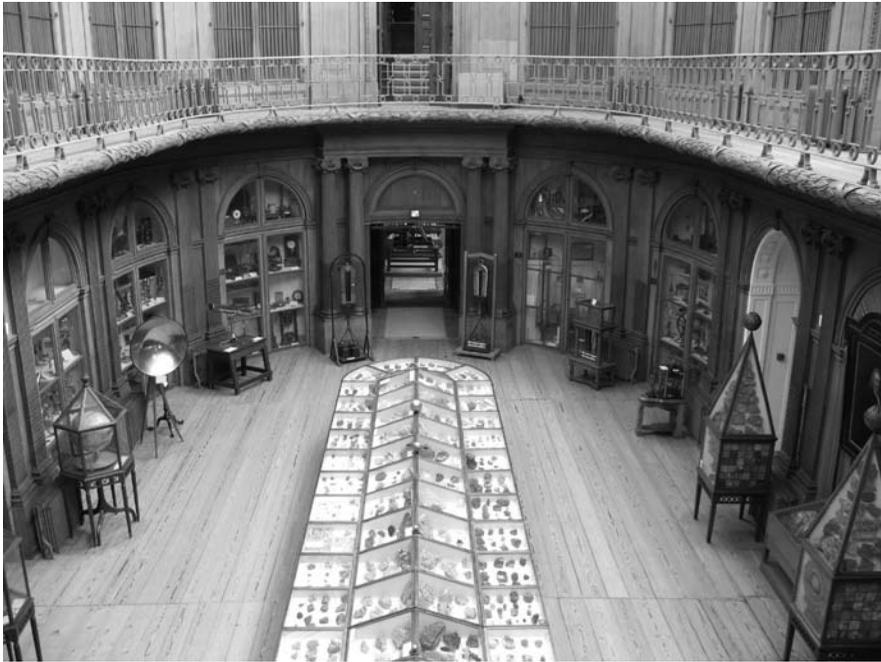
Mennonites in 18th-century Dutch societies could be the subject of a major study, but all I can do here is conclude by making a gesture to an outstanding institution founded by a Mennonite, Teyler's Museum in Haarlem, the oldest museum in the Netherlands, and the two societies associated with its founding, Teyler's First Society, concerned with theology, and Teyler's Second Society, aimed at the promotion of the sciences and arts, including fine arts. The museum and the societies were created through the bequest of Pieter Teyler van der Hulst (1702-78), an enormously wealthy Mennonite financier who died childless and left his entire estate to a foundation that funded the museum, the two societies, and a home for widows. The museum, which still exists though no longer as an independent institution, survived for over two centuries on Teyler's bequest. Its scientific activities were not insignificant. From 1910 to 1928 its scientific director was Hendrik Lorentz, one of the outstanding physicists of his generation. Teyler's Museum collected widely, and its collection of late 18th and early to mid-19th century scientific instruments is outstanding. Among its holdings are many instruments very similar to those once in the Mennonite Seminary, and a visitor to the museum today will see the famous "Oval Room" and its splendid instruments much as they were in about 1800 (see Fig. 7).

### **Concluding Enlightenment**

In many ways Teyler's Museum reflected some of the fundamental changes that were taking place at the close of the 18th century in the Netherlands, in natural knowledge, and among Mennonites. The most consequential of these changes were the struggles in the 1780s and 1790s between the "Patriots" and William V, Prince of Orange, the last Stadtholder of the Dutch

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<sup>41</sup> K. Hovens Greve, "Maatschappij tot Nut van 't Algemeen," *Global Anabaptist Mennonite Encyclopedia Online*, [1957], <http://www.gameo.org/encyclopedia/contents/M28.html>, accessed 8 June 2011. On Societies in general see Wijnand W. Mijndhardt, "The Dutch Enlightenment: Humanism, Nationalism, and Decline," in *Dutch Republic in the Eighteenth Century*, 197-223, esp. 216-23.



*Figure 7. Oval room of Teyler's Museum, Haarlem. Photograph by the author, 2006.*

Republic. Although William V, with the help of Prussian troops, did reassert his power temporarily over Patriot forces, his authority did not run deep with the Dutch populace. The extent to which French revolutionaries were inspired by the zeal of the Dutch Patriots may be a matter of debate, but there is little doubt that the French revolutionary army met with limited resistance and considerable Patriot enthusiasm when it invaded the Dutch Republic in 1795 and established in its place, with a new constitution, the Batavian Republic. The Napoleonic period brought further change, with Napoleon creating the Kingdom of Holland (ruled by his brother Louis Bonaparte) and making it part of the French empire.

Science was changing too, and in 1779 Martinus van Marum became director of Teyler's Second Society. Van Marum, who was not Mennonite, was very much a modern figure, part of that generation which was turning science into a profession and giving it the shape it would have in the 19th

century. Amateurs and hangers-on had no business in this new scientific world. The collections grew dramatically under Van Marum's direction and the institution made no bones about favoring experts with specialized knowledge. At the start of the 18th century the Vincent cabinet was a kind of private museum open to anyone who could pay admission; by century's end Teyler's institution was more recognizably a modern museum, especially in the arrangement and display of its collections, though its admissions policy was based on the traditional (and undemocratic) letter of reference. Van Marum and the Directors of Teyler's Foundation were building an elitist institution, one that was doing its part in the remaking of science in the late 18th and early 19th centuries.<sup>42</sup>

As for Dutch Mennonites, many among them were growing dissatisfied with the character of their accommodation within the Republic. To have tolerance extended in exchange, literally, for favorable loans in support of the Dutch war effort, as had been the case in Friesland, was no longer acceptable – it was more like an insult. This dissatisfaction with the state of things was pithily expressed, albeit in another context, by Goethe: “Tolerance should really only be a transitional way of thinking; it must lead to acceptance. To tolerate is to offend.”<sup>43</sup> The Mennonite promotion of natural knowledge throughout the Dutch Enlightenment was in various ways linked with the economic and moral business of the Republic, just as it was part of a larger picture that saw reason and faith as going hand in hand. The political corollary of such a view was that there was no reasoned foundation for an “official” church on the one hand and a group of tolerated religions on the other. As we have seen, Mennonites were important actors in Dutch life through much of the 17th and all of the 18th century, and the restrictions on their participation in civic life were minimal. But equality is not something

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<sup>42</sup> For his Museum and Societies see the chapters in *‘Teyler’, 1778-1978: Studies en bijdragen over Teylers Stichting naar aanleiding van het tweede eeuwfeest* (Haarlem and Antwerp: Schuyt & Co., 1978), in particular Wijnand W. Mijnhardt, “Viertig Jaar Cultuurbevordering: Teylers Stichting, 1778-1815,” in *ibid.*, 58-111. On Teyler himself see the essays in Bert Sliggers et al., *De Idealen van Pieter Teyler: Een erfenis uit de Verlichting* (Haarlem: J.H. Gottmer and Teylers Museum, 2006), which includes a reprint of Teyler's will.

<sup>43</sup> Johann Wolfgang von Goethe, *Werke*, ed. Erich Trunz, 14 vols. (Munich: DTV, 1988), XII, 285. This maxim likely dates from the 1810s or 1820s.

that will do in half measure, or in moderation, and many Mennonites wanted the full measure and so became active in the Patriot movement. Full equality did come by 1796, but for some Mennonites it was at the price of abandoning their pacifist principles. Dutch Mennonites had managed through much of the 18th century to embrace Enlightenment ideals, to avail themselves of the benefits of natural knowledge in the service of their faith and of their country. In the late days of the Enlightenment it became clear that the Netherlands was experiencing very dramatic changes that would last well into the 19th century. But to tell the story of how Mennonites participated in, and adapted to, the remaking of the 19th-century Dutch science, politics, and culture is a task for another day.

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#### THE BECHTEL LECTURES

The Bechtel Lectures in Anabaptist-Mennonite Studies were established at Conrad Grebel University College in 2000, through the generosity of Lester Bechtel, a devoted churchman with an active interest in Mennonite history. His dream was to make the academic world of research and study accessible to a broader constituency, and to build bridges of understanding between the academy and the church. The lecture series provides a forum through which the core meaning and values of the Anabaptist-Mennonite faith and heritage can be communicated to a diverse audience, and be kept relevant and connected to today's rapidly changing world. Held annually and open to the public, the Bechtel Lectures provide an opportunity for representatives of various disciplines and professions to explore topics reflecting the breadth and depth of Mennonite history, identity, faith and culture. Lecturers have included Terry Martin, Stanley Hauerwas, Rudy Wiebe, Nancy Heisey, Fernando Enns, James Urry, Sandra Birdsell, Alfred Neufeld, and Ched Myers and Elaine Enns.