The theory and practice of pharmacy in Pennsylvania: Observations on two colonial country doctors

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When William Penn opened his lands to settlers from the German territories, he not only provided access to different Protestant denominations but also opened a door to medical traditions, practices and practitioners from an area that extended from the Swiss cantons in the southwest of the German Empire to Silesia and the Prussian territories in the east. The practitioners settled among and provided medical care to German immigrants, whose numbers grew substantially over the decades leading to the War of Independence.[1] In most German language areas of eighteenth century Europe, people were accustomed to modest but pervasive levels of structured medical care.[2] While bedside medicine was largely reserved to the monied classes in their homes and to the charity population in poorhouses and municipal and religious hospitals, the majority of people had access to a wide range of formal and informal ambulatory services, from the town physician to barber surgeons and apothecaries to the whole range of early modern providers. People of all walks of life used these medical resources frequently, selectively, and often judiciously, given the persistence through-

1. Marianne S Wokeck, *Trade in Strangers. The Beginnings of Mass Migration to North America* (Pennsylvania State University Press, 1999)
2. A fuller account of the medical care aspects of German colonial immigration is in Renate Wilson, *Pious Traders in Medicine. A German Pharmaceutical Network in 18th Century North America* (Pennsylvania State University Press, 2000), which contains a full bibliography. In this paper, we restrict ourselves to representative and, where possible, recent work in English that provides access to the interested reader into the large body of European writings on 17th and 18th century medicine.

out eighteenth century Europe of a range of classifications of symptoms, diseases and treatment options. They turned to — or used simultaneously—self medication, physician care or the prescriptions of the so-called empirics—untrained but often quite experienced men and women—depending on severity of illness or urgency, failure of previous treatments, predilection and financial resources.[3]

Once ashore in North America, often beset by the morbid sequelae of naval passage and soon attacked by a variety of local diseases and epidemics, German immigrants found themselves in strange territory in more ways than one—climate, geography, languages, and medical flora.[4] Apart from some treasured medical stores and recipe collections brought along as part of their baggage, and aside from the presence of women able or at least willing to assist in birthing or other female complaints, little trained medical and surgical help or knowledge existed in most early settlement. Usually, this type of help did turn up within the first five or ten years of community growth as a patient population came to support one or two practitioners. In German areas of settlement from New York to Georgia, trained medical providers were often former French, Swiss or German military personnel such as field apothecaries or barbers left adrift after the European campaigns of the early part of the 18th century, who would stay on if there was a large and sufficiently prosperous catchment area to generate income.[5] These arrivals included numerous practitioners holding radical religious beliefs, en-

3. The most recent and comprehensive English language account of the full spectrum of medical care in a German territory is by Mary Lindemann, *Health and Healing in 18th Century Germany* (Johns Hopkins University Press, Baltimore, 1996), which centers on the duchy of Braunschweig Wolfenbüttel. For a comparative perspective, see for example Roy Porter ed., *The Popularization of Medicine* (London: Routledge, 1992), and Andrew Cunningham, and Roger French, ed., *The Medical Enlightenment of the Eighteenth Century* (Cambridge: Cambridge University Press, 1990); for France, Laurence Brockliss and Colin Jones., *The Medical World of Early Modern France* (Oxford: Oxford University Press, 1997).

4. David L. Cowen, *Medicine and Health in New Jersey: A History* (Princeton, New Jersey: Van Nostrand, 1964); John Duffy, *From Humors to Medical Science: A History of American Medicine* 2nd ed. (Urbana and Chicago: University of Illinois Press, 1993); Norman Gevitz and Micaela Sullivan-Fowler, "Making Sense of Therapeutics in Seventeenth-Century New England," *Caduceus: A Humanities Journal for Medicine and the Health Sciences* 11.2 (1995): 87-102.

5. A French surgeon practiced in Purysburg in South Carolina, for instance, and an army apothecary from Hungary, Andreas Zwifler, served in Ebenezer. See John I. Waring, *Medicine in South Carolina* (Charleston: South Carolina Medical Association, 1964); Renate Wilson and Hans Joachim Poeckern, "A Continental System of Medical Care in Colonial Georgia," *Medizin, Gesellschaft und Geschichte: Jahrbuch des Instituts für Geschichte der Medizin der Robert Bosch Stiftung* 9 (1992): 99-126. Bodo Otto (James E. Gibson, *Bodo Otto and the Medical Background of the American Revolution*, 1937) also seems to have been an army surgeon first. These people normally were not part of religious immigrant groups, who usually opposed military service.

couraged by both the general religious tolerance prevailing in the middle colonies and the absence of an entrenched academic establishment.

The medical communities of colonial Eastern Pennsylvania provide a good example of the range of religious dissenters, among them quite sophisticated medical practitioners from Silesia, Huguenot France, the Palatinate, and Protestant Hungary.[6] Many came from private European colleges—the medical dissenting academies that stood in opposition to the academic monopoly.[7] Some could not have practiced either their religion or their profession in Europe. In British North America, they provided a level of rural medical practice and pharmaceutic dispensing that, except for the academic trappings which they rejected for religious reasons, differed little from European models of practice, if not of medical thought. The ordained clergy, both from Lutheran and Reformed backgrounds, also practiced side by side with other German medical men and women along the East coast and in the back counties of Pennsylvania, Maryland and Virginia. In this clerical practice, they resembled their Congregationalist colleagues in New England, the Presbyterians in the middle colonies, and their brethren from the Anglican Society for Promoting the Gospel in Foreign Parts, who had all practiced medicine since the 17th century.[8] Although not necessarily possessed of university training, many even among itinerant ministers had a fairly good understanding of Latin and some aspects of medical therapy, including access to medical texts, herbals, and other traditional literature.[9] They were willing to join medical and clerical practice for reasons of community cohesion and the need to augment their incomes,

6. Andrew S. Berky, *Practitioner in Physick: A Biography of Abraham Wagner, 1717-1763* (Pennsburg, Pa.: Schwenkfelder Library, 1954). Louis A. Meier, *Early Pennsylvania Medicine* (Gilbert Printing, Boyertown, Pa. 1976);Jacob Woodrow Savacool, "Illness and Therapy in Two Eighteenth-Century Physician Texts," *Caduceus: A Humanities Journal for Medicine and the Health Sciences* 13.1 (1997): 51-66.

7. Christa Habrich, "Untersuchungen zur pietistischen Medizin und ihrer Ausprägung bei Johann Samuel Carl und seinem Kreis," unpublished Habilitationsschrift. Ludwig-Maximilians-Universität, 1982; *Id.* "Characteristic Features of Eighteenth-Century Therapeutics in Germany," *Clio Medica* 22 (1991): 39-49.

8. For New England, see in particular Patricia A.Watson, *The Angelical Conjunction: The Preacher-Physicians of Colonial New England* (Knoxville: University of Tennessee Press, 1991); Cotton Mather, *Angel of Bethesda*; Gevitz and Sullivan-Fowler, "Making sense of therapeutics."

9. Roger K. French, and Andrew Wear, ed., *The Medical Revolution of the Seventeenth Century* (Cambridge: Cambridge University Press, 1989). As noted by Watson, *Angelical Conjunction*, the New England ministers seem to have been drawn in particular to chemiatric materia medica.

and they enjoyed some measure of respect and the confidence of their congregations.[10]

The intermingling of services by trained and untrained laymen and women, and the clergy, probably provided a fair degree of access to medical care by potential patients of German language origins. But what did not emerge was an integrated hierarchical network with academically trained physicians at the center. One reason for this absence stemmed from the lack of a hierarchical corporate structure, as it existed in Germany, England and France, where colleges of physicians, medical councils and universities ensured a fair amount of top to bottom interdependence and control.[11] More importantly, for historical reasons, denominational competition and distrust kept even the German practitioners apart from each other, so that we find little specific documentation on whether and how they interacted. [12] The journals and letters of Henry Melchior Mühlenberg are a good example of this: While there are few sources providing a richer and more astute German perspective on the religious, political, and local state of the Commonwealth of Pennsylvania and adjoining colonies, the important community building role of the Moravians gave way in Mühlenberg's journals and letters to a blow by blow account of the fierce competition between the followers of Count Zinzendorf and the German Pietist Lutherans for pride of place in German congregations.[13] We know much too little, therefore, of the Moravian medical networks in the colonies and where their practitioners had trained and how they practiced. Equally, while medical men like Abraham Wagner, who was close to the medical establishment at Mühlenberg's motherhouse, the Pietist Orphanage at Halle, receive cursory

10. For a detailed discussion of this medical clergy and their background, see most recently Wilson, *Pious Traders in Medicine.*

11. From the abundant literature on this subject, see above all Brockliss and Jones, *Medical World of Early Modern France,* for early modern France; for seventeenth century England Harold J. Cook, *The Decline of the Old Medical Regime in Stuart London* (Ithaca: Cornell University Press, 1986), for eighteenth century Germany, and Lindemann, *Health and Healing.*

12. This statement is not to contradict the work by Meier and Berky, *ibid.*, which not unreasonably posits close interaction, but rather to the lack of documentation showing agreement or dissent on therapy or medical theory.

13. Theodore G. Tappert and John W. Doberstein, ed., *The Journals of Henry Melchior Muhlenberg. vol 1, 1742-1763, vol 2, 1764-1776, vol. 3, 1777-1787* (Philadelphia: Mühlenberg Press, 1942-1958 (reprint: Picton Press, 1982); Kurt Aland, ed., *Die Korrespondenz Heinrich Melchior Mühlenbergs: Aus der Anfangszeit des Deutschen Luthertums in Nordamerika. vol. 1, 1740-1752, vol. 2, 1753-1762, vol. 3, 1763-1768, vol. 4, 1768-1780* (Berlin and New York: de Gruyter, 1986-1993).

mention, important practitioners like George de Benneville, a friend of the Sauer clan, do not surface in contemporary diaries or correspondence.

To this general lack of mutual recognition must be added Anglo-American unwillingness to accept a valid foreign medical and pharmaceutical presence in North America, however provincial and heterogeneous.[14] Few colonial American physicians in the middle colonies, whatever their origin, held full European medical degrees and could do without the preparing and dispensing of pharmaceuticals. Most, if not all, American medical men prepared and dispensed their own medications, since fee bills and custom usually provided fees for the medication and not the visit, unless surgery or delivery was involved.[15] Even in the 1760s, when a younger and largely native born cohort of physicians returned from Europe, most of the reputable and even famous among the American medici ran their own pharmaceutical business, including John Morgan, principal founder of the Pennsylvania Medical Society and Hospital in 1767, Benjamin Say, Adam Simon Kuhn (the father of Adam Kuhn in Lancaster), and the compiler of the first American pharmacopoeia, William Brown.[16]

In this paper, we will focus on two continental European practitioners from very different social and geographic backgrounds but comparable religious orientation. They are Abraham Wagner, a member of the Schwenkfelder sect from Silesia, and George de Benneville, who came from a French Huguenot refugee family and is considered the founder of the Universalist Church in the colonies. For both, background and training are known at least in outline. They had substantial and remunerative American practices in which pharmaceutical dispensing played a major role, and both left a substantial if unexplored corpus of therapeutic and medical writings. [17]

14. See the perceptive comments by, Whitfield J. Bell, Jr., *The Colonial Physician and Other Essays* (New York: Science History Publications, 1975): 229.

15. Cowen, *Medicine and Health in New Jersey*, pp.10-11; Waring, *Medicine in South Carolina.*

16. For Morgan, see Whitfield J. Bell, Jr., *John Morgan, Continental Doctor* (Philadelphia, University of Pennsylvahia Press, 1965). For the attempt to specialize in medicine only, see Toby Gelfand, "The Origins of a Modern Concept of Medical Specialization: John Morgan's Discourse of 1765," *Bulletin of the History of Medicine* 50 (1976): 511-535. For Brown's work at Moravian Lititz, see Kremers, in the *Badger Pharmacist*, 1942: 27-30. More recently on Brown, see David L. Cowen, " The Letters of Dr.William Brown to Andrew Craigie," *Pharmacy in History* 39 (1997): 140-147.

17. At this stage, the authors can only provide selective quotes from their works, which reside mainly at the College of Physicians and in the Schwenkfelder archives and remain to be fully transcribed.

German medical practitioners

First, however, we must devote a brief look at the reservoir of German medical providers among whom they practiced, based on extant if sparse and fragmented colonial sources. A small but seldom recognized German medical culture had existed since the first German settlements were founded in Pennsylvania. As was true for the Spanish and the French, planned settlements were usually equipped with medical staff.[18] In the German case, medical providers came with many of the radical and dissenting groups that arrived between 1690 and 1740. The first documented physician was Daniel Falkner, born in 1666, who came to Pennsylvania in the 1690s with Sartorius, returned first to Germany and then again to the colonies as an agent of the Frankfurt Company, an enterprise closely connected to the nascent Pietist movement in Southwest Germany.[19] He practiced medicine and served New Jersey and Pennsylvania congregations until his death in 1741. His medical competence is reflected by a comment of the head of the Albany congregations, a man not known for his generous temperament, who called him a veritable "Galen" as late as 1730.[20]

A good number of medical providers emerged among the Moravian groups and the Schwenkfelders, the former mostly but not always serving as part of their community obligations, the latter practicing freely. Many of these practitioners took up practice in the 1730s and 1740s and were clustered in the Eastern Pennsylvania and Western New Jersey counties. The Moravians set up a community hospital in Bethlehem in 1744, antedating the Pennsylvania hospital in Philadelphia by several years. [21]

Altough the training of these medical providers of European origin can only be documented in part, it is obvious from scattered and usually critical comments in the contemporary literature and from advertisements in journals and gazettes that the range of their training was just about as large as has been found for Europe.[22] There were among all nationalities a few "legitimate" physicians, whether academically trained or apprenticed, who have been the major focus of American medical his-

18. Ronald L. Numbers, ed., *Medicine in the New World* (University of Tennessee Press, 1987).
19. Charles H.Glatfelter, *Pastors and People* (Kutztown, Pa.: Kutztown Press, 1981), vol. 2, 517; Julius Friedrich Sachse, *History of the German Role in the Discovery, Exploration and Settlement of the New World* (Bowie, Md.: Heritage Books, 1991).
20. See Sachse, *The German Pietists in Pennsylvania.*
21. Meier, *Early Pennsylvania Medicine,* p. 76.
22. For Germany, see most recently Lindeman, *Health and Healing.* For France, see Brockliss and Jones, *The Medical World.*

torians until quite recently.[23] There were some extraordinarily gifted men (and apparently a few women).[24] Among the Moravians were Bishop Johann Ettwein and Johann Adolph Meyer, the latter a son of a pharmacist from Halberstadt, who came to the colonies in 1742. In midlife, Meyer practiced outside the closed Moravian communities but within the Eastern Pennsylvania medical area. By the time of the Revolutionary War, he returned to the Moravian community at Lititz, where he died in 1781. Johann Friedrich Otto from Meiningen, who had studied at the Universities of Jena and Halle, was another Moravian who arrived with the first large wave in 1743, practicing in Bethlehem for most of his life, as did his brother.[25]

Several former Imperial Army surgeons and apothecaries who for some reason did not go East, as did most German emigrants of the early modern period,[26] instead drifted across the Atlantic, often attracted first by medical opportunities in the slave colonies of the West Indies.[27] Andreas Zwifler was a Hungarian apothecary who came with the Salzburgers to Georgia in 1733. Christian Friedrich Martin apparently trained at the army medical-surgical college in Berlin and on his return from the West Indies, practiced in Pennsylvania. Several among the Reformed and Lutheran clergy went back to Europe in the 1740s and 1750s to obtain medical degrees and returned to practice in the colonies, such as Johann Bartholomeus Rieger. Then there were numerous quacks, some of them known from their newspaper advertisements, who like their counterparts in Europe may or may not have been competent herbalists, repairers of hernias or cutters of the stone. There also

23. Bell, *Colonial Physician;* and Cowen, *New Jersey Medicine.*

24. Both Bell, *ibid;* and Meier mention one or two practicing female physicians but could not document them. In one of his reports, Mühlenberg mentions "apothecaries, surgeons, physicians,.. masculini et foemin etc. generis." p. 429, Aland, ed. *Korrespondenz,* vol. 2, October 9, 1760, to his English and German superiors.

25. For Benneville, see Savacool, "Illness and Therapy"; for Wagner, see Berky, *Practitioner in Physick.* Meier (*Early Pennsylvania Medicine)* gives a name-by-name account of many of the others, who also appear in diaries and letters. As for many 18th-century colonial practitioners, there is much medical filiopiety in particular with regard to European social antecedents and education. Most of the material on these men comes from a few local histories that have tried hard to fill the gaps in the vitae of their subjects.

26. Georg Fertig, "German Migration," in *Europeans on the Move: Studies on European Migration, 1500-1800,* ed. Nicholas P. Canny (Oxford: Oxford University Press and Clarendon Press, 1994), pp. 200-220.

27. A.M.G. Rutten, "Drinkbaar goud voor zwarte slaven; de geneesmiddel farbriktie op Curaçao in 1707 en de Hallese piëtisten," *GEWINA* 21(1998): 127-130; id. "Slavenhandel, ziekten en mortaliteit in de Curacaose medisch-farmaceutische geschiedenis," *Farmaceutisch Weekblad* 27.15 (1992): 389-406.

was the generally unsung body of midwives, often the wives or widows of clergy.

But with few exceptions, the literature on colonial American medicine is silent on where to place the more learned among these practitioners in terms of their medical philosophy and their therapies. Did the 17th century European struggles between iatrophysicists and iotrachemists persist among these practitioners and did it affect their practice of medicine, or were they eclectics and empirics in this regard? [28] Or did they maintain an implicit division between their theory and their practice, again like many of their European brethren? Overall, and in contrast to the New England practitioners examined by Patricia Watson, the theoretical baggage brought over by both sectarians and mainstream German and French practitioners has remained unexamined. We shall make a tentative start, then, with our two protagonists.

The Schwenkfelder Doctor

Abraham Wagner (b. 1717) immigrated in 1738 as a member of the Silesian Schwenkfelder group. He had served an apprenticeship in Silesia with Melchior Heebner, likewise a Silesian and Schwenkfelder who died in 1738.[29] Abraham Wagner's lengthy dispensatory, *Remediorum Specimina aliquot ex Praxi A.W.*, begun in 1740, is heavily oriented to the practical side of medical care and is full of recipes for the standard medications of the day, including bezoard powder and polychrest pills, balsamus and pulvis vitalis, and a spiritum discutiens.[30] Like many of his contemporaries, Wagner was not averse to crude antimony as an emetic, and for dysentery and inflammatory enteric conditions prescribed small doses of laudanum (opium) and a multiple-ingredient theriac (theriac andromachus). His preparations in many instances, such as

28. Allen G. Debus, *The English Paracelsians* (London: Oldbourne, 1965); Debus, ed., *Science, Medicine and Society in the Renaisssance: Essays to Honor Walter Pagel* (New York: Science History Publications, 1972); Debus, "History with a Purpose: The Fate of Paracelsus," *Pharmacy in History* 26 (1984): 83-96; Brockliss and Jones, *The Medical World of Early Modern France.*

29. Despite the ravages of early modern warfare, Silesia had remained a highly developed territory with several important centers of learning. Students from Silesia appear on the rolls of the University of Padua, the major academic medical school of the early modern period. I thank Jerry Bylebyl for this information.

30. The manuscript was used by Berky, *Practitioner in Physick*, and is located at the Schwenkfelder Library, its original depository. All quotes in this paper are from Berky or from excerpts obtained at the Schwenkfelder library that do not bear internal pagination.

the *Lebenspulver*, parallel the so-called Halle Orphanage medications.[31] One of his bezoar powders is specifically noted as pulvis bezoardicus halensis, using an older recipe that contained the sweat-inducing antimonium diaphoreticum, although his compendium of pulvis contains as well his own (A.W.) P. Bezoardicus c. preciosis, that is, with the addition of precious stones serving as an antidote to poison.[32] Wagner and his preceptors, his grandfather and Melchior Heebner, seem to have been quite familiar from their European training with the famous Orphanage medications and their developers, the brothers Richter from Sorau in Silesia, whose last survivor, Johann Sigismund, died in Halle in 1739.[33] Abraham Wagner sought contact with Heinrich Melchior Mühlenberg and occasionally supplied him with small amounts of drugs.[34]

To the extent that we can determine, the *Remediorum Specimina*, as noted in their title, contain mainly practical observations relating to the diseases seen in his patients and indications for use of his various recipes, which in turn show his thorough familiarity with mainstream European practice of the period. He applied or recommended venesection, but apparently with some degree of caution, and recommended teas, poultices and bedrest for depleted patients. There are references to medications developed by both Friedrich Hoffmann and Georg Ernst Stahl, the famous representatives, respectively, of early 18th century iatrophysics and iatrochemistry, and in this respect Wagner was as

31. For these, see again Wilson, *Pious Traders*, in particular chapters 3, 6, and 7, and David L. Cowen and Renate Wilson, "The Traffic in Medical Ideas: Popular Medical Texts as German Imports and American Imprints," *Caduceus: A Humanities Journal for Medicine and the Health Sciences* 13.1 (1997): 67-80.

32. Comparison with the Halle Orphanage medications is based on the transcription by Hans Joachim Poeckern, *Die Halleschen Waisenhausartzeneyen* (Leipzig: Edition Leipzig, 1984). See also Wilson, *Pious Traders in Medicine*, Table 3.1 .

33. See Berky, *Practitioner in Physic*, p. 82 ff for Wagner's medical background and library. For Wagner's own account, see Aland, ed., vol. 2, Letter 137, Wagner to Mühlenberg, p. 69. The similarity in medications and names observed in this instance supports the assumption by Wilson, "Traffic in Halle Orphanage Medications" that the Halle armamentarium in fact picked up older remedies with slight modifications.

34. Aland, ed., *Korrespondenz*,\Letter 177, vol. 2, 22 June 1757. Unfortunately, Berky's material is poorly documented and the translations are suspiciously modern in some instances.

35. Almut Lanz, *Arzneimittel in der Therapie Friedrich Hoffmanns (1660-1742): Unter besonderer Berücksichtigung der Medicina consultatoria (1721-1723)* (Braunschweig: Deutscher Apotheker-Verlag, 1995); Jürgen Konert, "Academic and Practical Medicine in Halle During the Era of Stahl, Hoffmann, and Juncker," *Caduceus: A Humanities Journal for Medicine and the Health Sciences* 13.1 (1997): 23-38.

pragmatically eclectic as his European contemporaries.[35] He employed the traditional mainstays of 18th century medicine–diaphoretics to produce sweat, emetics to encourage vomits, and laxatives to cleanse bowels and all digestive vessels— and his recipes for these were composed of both the powerful botanical materia medica from the classical Galenic reservoir and mineral preparations and distillations in the chemiatric tradition of the 17th century, dispensed as powders, tinctures, and elixirs.

An interesting question is whether Wagner prepared all his own medications or imported some arcana and patent medicines from Germany and if so, by what pathways. The trade from England in both materia medica and patent medicines like Stoughton's elixir or Lockyer's pills is reasonably well documented for the entire 18th century.[36] There is no corresponding documentation for commercial imports from central Europe with the exception of the trade in Halle Orphanage medications under philanthropic auspices.[37] There are indications both in advertisements and internal correspondence that the wholesaler of the Orphanage medications David Samuel von Madai, shipped medications through commercial contacts in Altona, then a Danish dependency, and London, both through official customs channels and as part of the personal baggage of immigrants and transatlantic travellers taking care of wills and estates.[38]

That Wagner enjoyed a considerable medical and personal reputation is clear from his complex and detailed will, in which he left one third of his considerable estate (well in excess of £1000) to be distributed to the poor through a number of surviving associates. He died in 1763. The bequests included a donation of £20 to Pennsylvania Hospital, and he forgave his impecunious patients their book debts, with incoming monies to be added to the charity trust. His known written legacy consists mainly of edification literature. We do not know if Wag-

36. John K. Crellin and J. R. Scott, "Lionel Lockyer and His Pills," (Wellcome Institute of the History of Medicine, 1974), 1182-86. Porter, Roy, and Dorothy Porter, "The Rise of the English Drugs Industry: The Role of Thomas Corbyn," *Medical History* 33 (1989): 277-295. Steele, Ian Kenneth *Atlantic Merchant-Apothecary: Letters of Joseph Cruttenden, 1710-1717* (Toronto and Buffalo: University of Toronto Press, 1977). Porter, Roy, ed., *The Popularization of Medicine* (London: Routledge, 1992).

37. Wilson, *Pious Traders,* chapters 5-7.

38. An interesting example is the trade in hunting rifles by Caspar Wistar. See Rosalind J. Beiler, "From the Rhine to the Delaware Valley: The Eighteenth-Century Transatlantic Trade and Communication Channels of Caspar Wistar," in Hartmut Lehmann, et al., eds., *In Search of Peace and Prosperity: New Settlements in Eighteenth-Century Europe and America* (Pennsylvania State University Press, 2000)

ner's orientation to chemiatric substances found any correspondence in a theoretical framework that included alchemy and the natural magic found among many seventeenth century English authors of radical religious beliefs.[39]

The Pennsylvania Country Doctor

When we seek to provide an explicit link between the successful practice of medicine by colonial practitioners from Central Europe and their theoretical background, the best, if still tentative, case is that of George de Benneville, who left among other, largely religious and alchemical writings, a full American medical testament, the *Medicina Pennsylvania.*[40] As is true for Abraham Wagner, de Benneville's voluminous recipes and courses of treatment reflect a mixture of Galenic and chemiatric practice, although there is an intriguing persistence of the latter.[41] He applied or recommended venesection, but apparently with some degree of caution, and like Wagner recommended teas, poultices and bedrest for depleted patients, cautioning against bleeding in a number of specific instances, like the tartarous diseases discussed briefly below.

The de Benneville manuscript (*Medicina Pensylvania or The Pensylvania Physician)* is a hand-written 187-page document numbered in duplicate pages to p. 148, written in English on the versos and in German on the recto of the folios. The left side of the cover page is

39. From the dauntingly large literature on this subject, see in particular, Allen G. Debus, *The French Paracelsians: The Chemical Challenge to Medical and Scientific Tradition in Early Modern France*; Charles Webster, *The Great Instauration: Science, Medicine and Reform, 1626-1660* (London: Duckworth, 1975) and *id.*, "Alchemical and Paracelsian Medicine," in *Health, Medicine and Mortality in the Sixteenth Century*, ed. Charles Webster, (Cambridge: Cambridge University Press, 1979): 312-315; Allen G. Debus and Michael Walton, eds., *Reading the Book of Nature: The Other Side of the Scientific Revolution* (16th Century Journal Publishers, 1998). Most recently, see Lawrence M. Principe, *The Aspiring Adept, Robert Boyle and His Alchemical Quest, including Boyle's "Lost" Dialogue on the Transmutation of Metals* (Princeton: Princeton University Press, 1998).

40. Most of his writings on these matters are at the Schwenkfelder depositories. The manuscript of the *Medicina* is at the College of Physicians in Philadelphia. See Savacool, "Illness and Therapy," and Crellin, "How shall I take my medicine." An older biographical source is Albert D. Bell, *The Life and Times of Dr. George de Benneville, 1703-1793* (Boston: Universalist Church of America, 1953), published on the 250th anniversary of de Benneville's birth, which is mainly concerned with religious aspects of de Benneville's life and his family history. The authors thank the College of Physicians for access to the de Benneville manuscript.

41. In the following, I summarize earlier findings in *Eighteenth Century Traffic in Medicines and Medical Ideas*, Renate Wilson,ed. *Caduceus: A Humanities Journal for Medicine and the Health Sciences* 13.1 (Spring 1997): 6-22, in particular by John Crellin in "How shall I take my medicine."

inscribed: "By a French Author. (signed) G. de B. Senior" and dated as circa 1770. Despite the author's French Huguenot origin, none of the text is in French, although Latin is used in an eighteen page trilingual unpaginated introductory listing of plant, animal and mineral substances which delineate the materia medica in the bulk of the work. The last thirty nine pages were probably written by a son, George de Benneville, Jr., (b. 1760) who is known to have practiced medicine in eastern Pennsylvania.[42] The English and Latin nomenclature in the beginning of the manuscript are in the same hand. A number of recto, that is, German pages bear the signature: George de Benneville, Student in Physic.[43] The son may have copied some of the manuscript from his father's papers if we assume that he both read and wrote German. The poor and nonidiomatic English of some of the material to p. 148 indicates that a good part of the translations into English, especially those relating to diseases and their treatments according to Paracelsian antecedents, were in fact translations by the senior de Benneville, who may have wished to instruct his son by this collation and transcription from an earlier commonplace book or directly from European sources. None of the sources are attributed, although this is typical of many early modern collections of mixed antecedents.[44] The dispensing parts of the manuscript suggest a more direct 18th century approach, and, as noted by Crellin, the materia medica include local North American substances like senega snakeroot and Ginseng.

Some of the differences are subtle and suggest a cultural difference in approaches. The very title page differs in emphasis between the English and the presumably original German version, suggesting an intention to adapt and perhaps publish the work for a multilingual audience of American practitioners. Ignoring 18th century idiosyncrasies in spelling, the very manner of self- reference reflects differences in how professional people in the colonies wished to describe themselves. The English sub-

42. The majority of the work is a clean copy; the remainder is in several rough hands; the German script appears German, including all capital letters. The "U "is marked by a slash. Note that de Benneville's name is spelled as George throughout, i.e., without the final "s" of the French name. He may well have been named after the consort of his patroness, Queen Anne, George of Denmark. While it might not be unreasonable to assume that the authograph on the folios was added by his son, there is only one page (fol. 76) where there is a full signature and a date attributable to the son, dated February 13, 1779.

43. Despite de Benneville's academic training, most likely at one of the dissenting academies, he may not have had a full medical degree. The academies could not award the doctor of medicine, a function reserved to the territorial universities.

44. William Eamon, *Science and the Secrets of Nature: Books of Secrets in Medieval and Early Modern Culture* (Princeton: Princeton University Press, 1994).

title of the *Medicina Pensylvania* reads: "or the Pensylvania Physician"; the German uses the qualifier "country" physician (*Land Artz,* sic). Other, more substantive differences are in the title for Sections I and III. Section I in English is entitled " The Theory and Practice of Pharmacy," while a more literal translation from the German would be "theoretical and practical chymical preparations." The English in Section "II, A Distribution of Medicinal Simples, According to their Virtues and Sensible Qualities — The Description, Use and Dose of Each Article," differs little from the German, although there the adjective "sensible" is missing from qualities. More intriguing is the change in emphasis in Section III, where " Directions for Extemporaneous Prescription with a select Number of Elegant Forms with the Astralis and Other Diseases in General" is quite different from the German, which we give in the following, again in a more literal translation. It promises "Instructions and descriptions of many medicinal preparations or composita, including their virtues, and the diseases in which they may help. In particular, astral accidents and painful chronic maladies." Section IV, "With a Instruction, How to Judge the Diseases by the Urine and the Knowledge of the Pulse Beating; For the Use of Mankind" is again pretty much the equivalent of the German.

The practice of pharmacy in terms of the constituents and preparation of simples and composita occupies the larger part of this manuscript, and we give below a summary of the materia medica in Section I. This is clearly intended for the professional and trained apothecary and presupposes considerable knowledge of the entire materia medica and in addition equipment and skills in laboratory processing. A comparative evaluation within a framework oriented to the theory and practice of medicine and pharmacy in colonial North America will have to await a full transciption. De Benneville's close if implicit interweaving of Paracelsian concepts of disease causation and therapeutics is of similar interest, although this framework may have been less one of practical significance than of a theoretical discourse directed to members of the profession of medicine. Given the scarcity of sophisticated printing presses and fonts, and their own orientation to the different European centers of learning and authority, medical providers in the colonies relied largely on European imprints and imported both texts and journals to keep their practice up to date. This may explain the relative lack of colonial American writings that attempt to join the practice of medicine and its pharmaceutical component to the numerous traditional and innovative theoretical frameworks abounding at the turn of the

17th century. By the second half of the 18th century, the theories on which de Benneville relied no longer were part of the mainstream of European medical teaching, although they persisted among movements of religious dissidence, as in the case of J.J. Dippel, who signed his work as Christianus Democritus.[45] In particular, de Benneville's linkage of diagnosis and treatment to the so-called tartars and catarrhs of Paracelsus[46] seems to have remained unaffected by subsequent attacks within the chemiatric tradition, for instance by van Helmont and Boyle.[47]

If publication in the colonies was in fact intended, the astrological and spagyrical schemes of disease causation and diagnostics, to which de Benneville added a lengthy section on uroscopy, may or may not have been considered in need of excision in 1770s.[48] But if he intended publication, then who was the intended audience? The translation of these materials into English in a formulary and dispensatory cum theory of disease causation contradicts ethnographic assumptions that natural magic resided exclusively among the unschooled lay Germans of Pennsylvania.[49] It may instead suggest the intent to introduce not only de Benneville's practice of pharmacy but some of its theoretical underpinnings into a colonial discourse on medicine that was not yet known for its academic debates. Before the Revolution, the coupling in a large dispensatory reflecting traditional pharmaceuticals with an orientation to Paracelsian schemes of the causation of diseases might in fact have found a publisher such as the Saur Press, and an audience at least among Saur's readership. By the 1780s, however, the new academic medicine of North America was looking elsewhere for its theories of disease causation, although its practitioners still used, often to excess, many of the reme-

45. For Dippel and medicine, see Habrich, "Theoretische Betrachungen", Johanna Geyer-Kordesch, "Georg Ernst Stahl's Radical Pietist Medicine and Its Influence on the German Enlightenment," in *The Medical Enlightenment of the Eighteenth Century* ed. Andrew Cunningham and Roger French, (Cambridge: Cambridge University Press, 1990): 67-87. Also Hans-Jürgen Scharder, *Literaturproduktion und Büchermarkt des radikalen Pietismus: Johann Heinrich Reitz. "Historie Der Wiedergebohrnen" und ihr geschichtlicher Kontext* (Göttingen: Vandenhoeck und Ruprecht, 1989).

46. Huser, ed., *Das Buch von den tartarischen Krankheiten,* as cited by Walter Pagel, *Paracelsus: An Introduction to Philosophical Medicine in the Era of the Renaissance* (New York: S. Karger, 1958).

47. Pagel, *Paracelsus,* and Principe, *The Aspiring Adept.*

48. For a discussion of German trends in the 18th century, see Heinz Schott, editor. *Der sympathetische Arzt. Texte zur Medizin im 18. Jahrhundert.* (Munich: Beck, 1998).

49. The best known example of this approach is Thomas R. Brendle and Claude W. Unger, *Folk Medicine of the Pennsylvania Germans. The Non-Occult Cures,* 1935. See also Cowen and Wilson, "Popular medical texts."

dies developed over centuries of mixed chemiatric and Galenical practice.[50] We find many of these medications embedded in the voluminous self-help or domestic manuals that became a mainstay of American publishing in the second half of the 18th century.[51] And when the heroic cures of venesection and calomel offered by both academic and less prominent physicians were slowly rejected both by the profession and by many patients, the new eclectic medicine of the early 19th century had little in common with either practice. [52]

The present state of research does not permit a full discussion of the questions raised for these two country physicians in particular and the other qualified German providers more generally. But we wish to illustrate at least in part two concurrent and intertwined strands of pharmaceutical and therapeutic practice. First, we present as Exhibit 1 an excerpt of the materia medica section in the *Medicina Pensylvania;* we then provide in Exhibit 2 excerpts from a section closely connecting diseases of specific parts and organs of the body caused by tartars and catarrhs to courses of treatment. While this scheme reflects Paracelsian and similar antecedents of disease causation through dysfunctional digestive mechanisms, the remedies suggested, often several at a time, are again a mixture of botanicals and chemical substances, suggesting an eclectic source for this part of the manuscript or de Benneville's own treasure of prescriptions tied into a Paracelsian scheme.

50. J. Worth Estes, "Patterns of Drug Usage in Colonial America," *New York State Journal of Medicine* 87.1 (1987): 37-45; Estes, "Therapeutic Practice in Colonial New England," in *Medicine in Colonial Massachusetts, 1620-1820* (Boston: The Colonial Society, distributed by the University Press of Virginia, 1980).

51. The most famous of these are Buchan and Tissot, who were extremely well received. (William Buchan, *Domestic Medicine, or a treatise on the prevention and cure of Diseases by regimen and simple medicines, with an appendix containing a dispensatory for the use of private practitioners* 5th, 7th, 20th edition, with improvements by the ed. (London: Publisher varies with edition, 1776, 1781, 1797), Samuel Auguste Tissot, *Advice to the People in General, with Regard to Their Health* (Philadelphia: Sparhawk, 1771). Among the rich secondary literature, see Lamar Riley Murphy, *Enter the Physician. The Transformation of Domestic Medicine, 1760-1860* (Tuscaloosa: University of Albama Press, 1991).

52. John S. Haller, *Medical Protestants, the Eclectics in American Medicine, 1825-1939* (Southern Illlinios University Press, 1994); Haller, *Kindly Medicines. Physio-Medicalism in America, 1836-1911* (Kent State University Press, 1997); Alex Berman, "The Heroic Approach in Nineteenth-Century Therapeutics," *Bulletin of the American Society of Hospital Pharmacists* 11 (1954): 320-327; Berman, "Thomsonian Movement," *Bulletin of the History of Medicine* 225 (1951): 405-428, 519-538.

Exhibit 1

Excerpts from a German-English Colonial Formulary.

Note: The listing from which the exerpts in the following are taken begins on the first numbered page of the de Benneville manuscript and extends to page 65, on English versos and German rectos throughout. Both English and German titles follow upon the common Latin name. The section on pillulae at the end of this exhibit terminates on fol.57, and is followed by brief sections on plasters, ointments and salves, glysters and gargles, pesseries, and baths. These are omitted here.

The section begins with simples in various forms, mainly from the botanical kingdom, but including some traditional animal substances. This is followed by chemiatric medicines, mainly of mineral origin, and numerous elaborate composita mixing botanical and chemical substances, some of these quite elaborate but rarely approaching the complexity of medications like the theriacs of the early modern age. Reflecting pharmaceutical practice, the arrangement of the composita is by form of preparation–from conserves and distilled wines and spirits to tinctures and powders to elixirs. Instructions for preparation are given throughout, as well as dosages and specific teas in which medications are to be taken. These are omitted in the following, but see the discussion by John Crellin in "How shall I take my medicine." We do include indications for use, in an abbreviated form with some direct citations. The term "breast" should be understood to refer to the chest.

Preparationes simpliores–Simple Preparations

[Instructions on how to prepare earthen and other such pulverable bodies as will not dissolve in water, including plant and animal substances, including an instruction for straining opium .]

Conserves

Leaves of Scurvy Grass	Use in scorbutic humours
Leaves of wood sorrel	For cooling
Leaves of spearmint	Vomiting, agues, looseness
Leaves of rue	Promotes digestion and in hysterics
Tops of sea wormwood	Dropsies
Flowers of lavender	Mild cordial - debilities of nervous system
Flowers of mallows	Disorders of breast and urinary passages
Red Rosebuds	Astringent, weakness of stomach and chest and bronchial complaints
Flowers of Rosemary	Strengthening of nervous system
Hyp(ericum)	Indispositions of stomach, bilious fluxes
Conserve of aloes	Gentle astringent

[Condita or candied preserves or syrups, including angelica root, lemon, citron and orange peel, elecampane root, and sugared steel, for obstruction of the menses, 2 fols.]

Succi or Juices

Scurvy grass	Scorbutic juice
Sloe juice	Moderately strong astringent
Rob of elder berries	Opens obstruction of viscera, promotes natural secretions, by urine, feces and sweat
Marmalade or jelly of quinces	Stomach troubles, retchings, diarrhea, dysenteries
Currant jelly	Scorbutic disorders

Extracts

Plantain	Mild astringent
Root of Elecampane	In a lax state of fibers of stomach and some disorders of the breast
Gentian root	Bitter astringent
Leaves of wormwood	Bitter astringent
Centaury	Bitter astringent
Chamomile	Bitter astringent
Black hellebore root	Purge, cathartic, but less violent than if made from raw root. "One of the best prepa rations of hellebore"

Leaves of Rue	no indication
Leaves of Savin	Stoppage of the menses
Licorice	No indication
Jalap, extract and resin	To draw off watery humours and cathartic
Peruvian bark, soft and hard	Fever and agues. Use in Camomile or Rue tea
Resin of Jalap	Cathartic. Takes off all sorts of watery humours

[*Distilled and pressed oils* prepared by expression, infusion, decoction, with full instructions (fol. 9-13)]

Salts and saline preparations [numerous and include acid salts, alkaline salts, ammonium salts, coral salts, fixed salts, and the following:]

Tin salt (sal jovis)	Mix with pomade - a dryer for the Itch and Boils
Staghorn (Sal cornu cervi fixatum)	Against all pestilent fevers
Tartar salt (Sal tartari)	Salt of various uses
Salt of many virtues (Sal polychrestum)	An excellent purge, also by urine
Nitre (Sal prunella)	

Resinous and sulphurous Preparations [for example:]

Resina scammonium	Excellent purge & takes away the sharpness of the gall
Sulphur factium	Asthmas and other disorders of the breast and lungs
Balsam of sulphur	Made with olive oil or other essential oils- Very good in the decay of the lungs

Metallic preparations

[accompanied by extensive instructions for laboratory preparation]

Prince metal	Copper and tin
Aurum	Apothecaries have some preparations of it but it is of no great consequence in medicine[1]
Argentum	Silver. Fine remedy in dropsical cases

Lapides Infernalis	Infernal stone for consuming warts, proud flesh and corns, other fleshy excrescences
Tr.[2] of silver	To take against fits, palsy, apoplexy and febris maligna
Volatile Tr. of copper	Produces surprising discharge of urine
Mars diaphoreticus (iron rust & Sal ammoniac)	Operates a sweat and is good for all diseases which derive from a superfluidity of watery humours. Also fevers and hysteric complaints
Rust of steel prepared	For every cause deriving from humours of the gall. Mix with heal-all, turnip, and Sal tartar powder
Salt of steel	Good in obstruction of the menses
Powdered tin	Against worms, used in the decrease of the moon - in molasses and tansy or wormwood tea
Calx of Iron	
Salt of tin	Good for itching humours and ulcers
Burnt lead	Mixed among drying salves
Sugar of lead	Mix with ointments against inflammations and inward against angina, hemorrhoids, and looseness
Mercury [as Mercurius dulcis and calomel]	For killing worms, venereal diseases, to open visceral obstructions
Sugared mercury	To sweeten the blood
Antimony	
Regulus antimony Medicinalis	Powder operates both up- and down wards
Crocus of antimony	
Antimonial emeticum	
Diaphoretic Regulus & Medicinalis	
Antimonium diaphoreticum (antimony & nitre)	Operates a sweat and sweetens the blood
Kermes mineralis	Sweetens blood

1. But see essentia dulcis below
2. Tr=tincture

Panacea antimoni	A purge to work upwards and downwards
Zinc	Small doses as diaphoretic, used exter nally for cooling, astringent and drying

Simple distilled Waters and Spirits

Alexeterial water	To prevent an empyreuma
Dill seeds water	In windy humours
Angelica water	In all sorts of poisons
Mugwort water (Artemisia)	Fresh leaves. Allow to ferment, then distill
Carduus water	From leaves of carduus benedictus
Orange peel aqua	To strengthen the stomach
Castor water	In hysteric cases
Mint water	Strengthening for a weak stomach
Peppermint water	Prevent empyreuma
Pennyroyal water	Is good in hysteric complaints
Damask rose water	Laxative
Rue water	Good in fits & hysteric cases

Spirituous Distilled Waters and Spirits
[Many of these are compounded from numerous herbs]

Aqua Regina Hungaria	Hungary water - to strengthen the nerves
Compound spirit of lavender	Strengthening for the heart
Spirit of Saffron	A great strengthener
Spirit of scurvy grass	Very good in scorbutic disorders, given in scurvy grass tea
Odoriferous water	A great strengthener
Wormwood water	Good for weak stomach
Compound anise seed water	Good for weak stomach and against the tympany
Orange peel spirit	Stomach and carminative
Compound bryony water	Hysteric complaints, melancholy
Cardamom seed water	Relieve gas and flatulence
Cinnamon water	Great strengthener
Plague water	Good in all sorts of poisonous diseases

Comp. juniper water	Catarrh, carminative, and difficulty of urine
Nutmeg water	In the flux, diarrhea, and fevers
Compound parsley water	All sorts of complaints of the kidneys and gravel
Compound peony water	All sorts of fits and falling sickness
Pennyroyal water	Great strengthener
Compound balm water	Also a great strengthener
Aqua vulneraria	For "...resolving coagulated blood, dissolving the tumours that arise of fractures and dislocations, for preventing the progress of gangrene, cleansing and healing ulcers and wounds. ...Also inwardly for wound fevers."

Decoctions and Infusions

Calcined Hartshorn "the white Decoction"	For flux, dysentery
Jelly of Hartshorn	A fine cooler in fevers
The Common fomentation	For any pain part. Contains mallow leaves, sea wormwood, camomile flowers Decoction made & applied locally and internally
For the jaundice	Celandine roots & leaves, turmeric, dried millipedes
Decoction of the Woods	Guaiacum, raisins, sassafras, licorice – good in all sorts of scorbutic humours in the blood
Nephritic decoction	Wild carrot seeds, linseeds, marshmallow roots, figs, raisins for all complaints of the kidneys
Nitrous decoction	Pure nitre (potassium nitrate), white sugar, cochineals. Use in inflammatory fevers, or flooding of the menses
Pectoral decoction	Barley, figs, stoned raisins, licorice. Is very good in decay of the lungs and disorders of the breast
Comp. Decoction of Snakeroot	Venice treacle, cochineal, syrup of meconium. "Is good in hot fevers while it works a gentle sweat"

Vinegars	
Vinegar of Roses	Liquor used for embrocating (moistening & rubbing) the head and temples in some kind of headaches
Vinegar of Rue	Antipestilential
Vinegar of Squills	Disorders of breast occasioned by thick viscid phlegm, promoting urine
Treacle vinegar (Venice treacle)	Celebrated in acute & contagious diseases as a sudorific and alexipharmic
Wines	
Alcaline aloetic wine	Reduced and calcined raw tartar, nitre, with added aloe sucotrina, saffron. Cleans the kidneys, strengthens the stomach
Bitter wine	Gentian, yellow rind of lemon peel, wine. Bitters to increase the appetite
Antimonial wine	Panacea antimonii filtered and mixed with wine. At low doses, purifies the blood and operates a sweat; at higher doses, works upon the urine; at large doses causes vomiting. Can also be used in the palsy
Steel wine	Iron filings macerated with cinnamon and mace in wine. "A fine medicine to build the blood"
Saffron wine	Saffron macerated in wine. "Is a great strengthener"
Wine of ipecacuanha	Vomit of ipecacuanha, cochineal, wine
Wine of millipedes	Bruised millipedes digested in wine and filtered. "It is good in the yellow jaunders, hooping cough and gravel."
Viper wine	Dried vipers with spices, macerated in wine, and filtered. Strengthener and restorative
Liquid Laudanum	Strained opium macerated in wine with cinnamon and cloves. "..in great pains."

(To all the foregoing wines after they have been strained you must add a little spirit to preserve them from fermentation)

Spiritous Tinctures

[Most are given with herbal teas, and many are complex mixtures of chemical and botanical substances]

Bitter Tr.	Gentian, orange peel, cardamom seeds in Spirits to strengthen stomach
Aromatic Tincture	A great strengthener
Balsamic Tincture	Balsam copaiba, peru, tolu, benzoin, saffron, sp. of wine. "Is good against the green, yellow and black jaunders, for the kidneys and some disorders of the breast."
Tr. of Benzoin	Disorders of the breast
Tr. of Cantharides	Gravel, stone, stoppage of urine and dropsy
Tr. of Cardamoms	Strengthening medicine
Tr. of (Russian) Castor	Strengthening the nerves and all sorts of female complaints and hysteria
Tr. of Peruvian Bark	Before or after fever
Tr. Saffron	Strengthener
Fetid Tr.	Hysteric complaints and some diseases of head
Tr. of Soot (wood soot, asafetida)	In hysteric cases and likewise epileptics and other nervous disorders
Tr. of Guaiacum	In rheumatic cases
Tr. of Jalap	All sorts of watery humours
Tr. Japonic (Japan earth, cinnamon, Peruvian bark)	Looseness, flux & super-fluidity of the menstreaus
Tr. Gum Lace (from Indian insect species)	Strengthening gums "and in bleedings and scorbutic disorders of them."
Tr. of Iron (Iron Rust, Glauber's Salt)	For humours of the blood, in stoppage of urine & menses
Tr. Hellebore Niger	Good in stoppage of menses and melancholic disorders
Tr. Myrrh	Against all corruptions, dose a teaspoon ful in heal-all tea. "Extremely corrupted wounds to drop some of this into it. Cleanses it Immediately."
Tr. Myrrh & Aloes	Similar to above

Tr. Rhubarb (Rhubarb, Gentian root, Snakeroot, Cochineals in Spirits)	Strengthens stomach, fevers & diarrhea
Tr. Saturnina (Sugar of Lead, green vitriol)	Good to obstruct sweating
Tr. Salutifira (Gentian root, Cardamoms, Cinnamon, long Pepper, Spirits)	Great strengthening for stomach
Tr. Sena (Senna Leaves, Rhubarb, Fennel Seeds, Juniper berries, Signum)	Good in windy colics
Tr. Serpentaria (Snakeroot, Spirits)	It operates a fine sweat
Tr. Stomachica (Raisins, Cinnamon, Fennel Seeds, Cummin Seeds & Cardamom Seeds in Spirits)	Great for strengthening the stomach
Tr. Styptica (Green Vitriol, Calcined, in Spirits)	Good inwardly and outwardly to stop in bleeding
Tr. Antimonii B.[3] (Panacea in Spirits)	Same as above
Tr. Sulphur (Hepar sulphur, flowers of Sulphur and tartar in Spirits)	In decay of the lungs and some disorders of the breast
Tr. Tolu (Balsam Tolu in Spirits)	Disorders of breast and rheumatic pains
Tr. Valerian (Valerian roots - Spirits)	Yellow yaunders, ruptures and pleuritic pains

3. The added "B." probably indicates de Benneville's own arcanum.

Essentia Dulcem[4]	Sulphur nativum, regenerated tartar in a crucible and when it flows clear...put into it by degrees a ducat of gold made into small pieces and dissolve. After preparation, a red powder remains in bottom. Put it into spirits of wine, 2 parts and spirits of turpentine, 1 part. Process, cool, filter & "the remaining powder is very good to use a few grains in any vehicle."	"This is a fine medicine in all the dangerest disorders to take a few drops in a little wine or a little sugar. It is a universal strengthening."
Argentum Vivium	Purified lead, regulus of antimony in aqua fortis	Filter and use a few drops in wine to sweeten the blood
Tr. Acoustica	Numerous herbs, orris root, in spirits. Process and add oil of bitter almonds & oil of amber	A few drops in the ear in the evening
Tr. Balsamum Vita	Balsam tolu, peruvian, & capivi plus storax, benzoin, myrrh, olibanum, aloe, angelica root, snakeroot, lavender, juniper berries, anise seeds, camomile, saffron, mace, cloves	Used for all sorts of "dangerosts disorders. Is a great strengthener and works a gentle moistness."
Tr. Gutta Vita	An opium extract plus numerous herbs.... Process, then add Tr. antimonii, Tr. theriacalis & Camphor	Strengthens, eases pains and sweetens the blood
Tr. Vita	Purified saltpeter, tartar, sulphur with numerous herbs.....	Fine medicine in all sorts of weaknesses, consumptions and to Strengthen all Inwardly parts

4. A second Essentia dulcem recipe consists of mercury, lead, and antimony

Elixir Vita	Multi-ingredient botanical	"This is a great strengthener and operates a fine sweat and is a good alexipharmaca. It can be used in all the dangerest nervous disorders and against all fevers."
P. Tabacum Anti-catarrhalis	flowers - (parts not given)e.g. rosemary, lavender, red rosa; several seeds and balsams. Includes cortes cascarill, cubebs olibanum, mastic and tobacco	"It is good for smoaking in catarrh and superfluidity of watery humours."
P. Sternutatorius	Various herbs, balsams, etc. pound and mix to a snuff	"Is good for headache and to strengthen the head."
P. Vermifugus	Wormseed, fenugreek, aloes, antimonium crudum. Pound and mix to fine powder	"Good for all sorts of worms, in the decrease of the moon to be taken."
P. Suffimentum	Juniper berries, benzoin, storax, amber, lavender flowers	For swellings with pain; ..."to receive the smoak by putting some of the pulvis on coals."
P. Solaris	Cinnabar, antimony, cinnabar nativa, sacher candise, aq. Flor. Aurantorium, oleum cinnamoni	Great strengthener
P. Bezoardicus	Antimonii diaphoreticum, cornu cervi, rad. angelica, gentian, red coral, bezoar orient., ocul cancorum praepar., succinum, and cinnabar nativ.	Good in all sorts of inflammation and liver disease
P. Antispasmodicum	Nitre, tartar vitriol, cinnabar nativ antimony diaphoreticum	Good medicine in the cramp heats for cooling

P. Stypticus	Alum, (?), root, tormentil root, abol arminicum, red coral	Good in tormentil tea in flooding and other bleedings. Externally in wounds.." but must be mixt with a little oil of nuts. Stops bleeding immediately."
P. Edulcorant		For diarrhea and red flux
P. ad Partem	Borax, castor, saffron,oil of cinnamon & succinium	Good medicine for labor pain
P. Diuretic	Spermaceti, and crabs eyes, cinnabar, antimoni, sal succinum, ammoniac, sal polychrestum, sal prunella, sal nitri, cremor tartar, sal absinth, bezoar occident. opium colatum, troschi alkadenzi, ext. Hellebore nigri, sachar candy. Mix. ..."Then take the sediment that settles in the chamber pot and burn it to a white salt and put 4 drams of this salt to it"	Good medicine in stoppage of the urine, gravel, and will melt the stone
P. Laxativus	Senna, jalap, rhubarb, aloe sucotrine, hellebore nigri and manna	"A fine purge taken in the morning fasting."
Pulvis Panacea	Crude antimony, nitre, crude tartar, sal carbo. Pound and detonate in iron pot. The residue is added to cremor tartar and further treated	Residual powder is useful to sweeten the blood and as a purge and vomit. Taken in the morning in warm wine or flax seed tea. "So often as it works drink flax seed tea upon it."

Pilula

[Most of these are recommended to be taken with a specified herbal tea.]

P. Asthma	Spermaceti, styrax, elecampane, licorice, benzoin, anise seed, crocus, sugar candy, with tr. Licorice	Good in disorders of the breast
P. Athiops Antimoniales		Good in ... "all sorts of scorbutic humours."
P. Mercuriales	Calomel, gum scamoni armoniae, jalap, aloe succotrine. with Tr. antimoni. ...	"They are for to purify the blood."
P. Catholica	Aloe sucotrine, scamoni, gum gutti, colocynth, balsam peru, oleum anisi, & caryophilloriana sue licorice	For purging
P. Polychrestum	Rhubarb, jalap, senna, ext. Aloe, hellebore nigri, gum golbanum, myrrh, ammoniac, castor, centaur, artemisia, calendula, crocus, camphor, oleum anisi, with tr. Asthmatica	Good to purify the blood and in hysteric complaints
P. Icteritia	Cremor tartar, gum ammoniae, venice soap, juniper oil, saffron, rhubarb, gentian, wormwood	Good in yellow and green jaunders
P. Anodin	Senna leaves, hellebore nigri, orange peel, cummin seed, speedwell, carduus, mastich, succinum, myrrh, ext. Opium with tr. Caryophillorum	Very good to ear pain

P. Hysterica	Asafetida, gum ammoniac, myrrh, aloe, gentian, galbanum hellebore nigri. Pound, mix & make mass with tr. Myrrh	Good in hysteric complaints
P. Febrifugus	Myrrh, venice soap, tr. Terebinthini, cort. Peru with tr. Cort. Peru	Good in fevers
P. Contra Consumpt	Venice turpentini, elecampane, licorice stick, ground ivy, florentine orris with tr. Licorice	Good in hectic fevers
P. Cathartica[5]	Pulv. Jalap, calomel, pulv. Aloe sucotrine with tr. Panchymagog or elix. Proprietatis	Purgative to carry bile from the stomach as well as a powerful diuretic. In dropsies as well as in liver affections, bilious complaints, etc.

5. This recipe is added in English only and in a different hand.

Exhibit 2
Tartars and Catarrhs and courses of treatment

Source note: Folios 69-76, *Medicina Pensylvania, Section III, Table of Diseases divided in Three parts, with the Principal Remedies Adapted to Each.* Part 1 deals with the astralis and astrabolic diseases in general, and their courses of treatment.Part 3 provides lengthy additional disease listings and remedies. We provide excerpts from part 2. Spellings and capitalization follow the original to the extent possible.

PART 2nd. Of Astralis or Astrabolismus Tartarous Diseases

The Tartar is a Coagulated Substance which forms itself in all parts of the Body, From the Different Sorts of Nourishment as it works into all Vegetables by Nature, out of the Earth and water and Dissolves in the Body. And if this Corroding poison is not Distroyd By Digestion And Carried of with the Excrement By Nature, It creates a Corrosive Substance in the Blood and Inward parts and is called Tartar of which there are Four Sorts as Viscus, Bolus, Arena Et Calculus Out of these four Coagulated Substances, derives all Tartarous Diseases in the Body.

So they must be Divided each in Particular According to the Nutriment, the Body takes, Namely the Legumina all them that is of a hard Texture as Caules, Radices, Frumenta, Herba which Creates Phleghmy, Slimy Tartar and is called Viscus, Has The Following Species Bitumen, Mucilago, Gluten Is all Materia Stericorum which at Last Coagulates in the Body, Thro the Spirit of Salis. This Tartar is Commonly Slimy of a White Colour as is Observed in Urin, like Viscus, or Cruditas which derives from the Tender Nourishments. Bolus, Tartarus resembles clay, is of a red Colour may Be rubd in Pieces like Bolus. If this Materia is not carried of, or out of the Prima will cause Obstructions, Putrefactions, Colics, Great pains with hot Paroxismus.

All Tartars that Derives from the Substantial Nourishment is of an Easier Dissolution than that of the Liquid Nourishment as it is of a Harder Coagulation and will Create Sharper paroxysmus, the most in all parts, according to the weakness and Strength of the Body, the Spiritus Salis which now Conjoins with The Tartar, Drys it, that it Concretes to a Stone, By the Coagulations that the Tartar has in the First Digestion of the Stomach, Then the Stomach will be Ailing and Creates An Extream hot Sulphurous Excrement. The Second Digestion is made

in the Liver By the Vini Misaraicis and there the Saline Substance is Separated and Frequently leaves some Tartar in the Liver, which is Disordered thereby, Discharges its Excrement as also his Spiritus Salis thro the Urin, which later in Discharge of Urin causes a Cutting, and is not unlike Salt Petre, all Sulphurous Matters. The third Digestion is made in the Veins and the Mercuriales Substance Separated. If there is any Tartar left in the Veins, it causes a Corroding Scorbutic Humour, which Creates, many Diseases in the Blood, they Discharge their Excrement Thro the pores and causes an Ill Scented Sweat. After the three Capital Digestions then the Dividing thro all the members of the whole Body is performed, and the Tartar Flows with it, There the Spirit Salis first Causes Gravel, That Creates Smarting Pains, Pleurisies Heat, Inflammations, Fear, and all Sorts of Deadly Diseases.

The Tartar never Settles in wet or moist parts of the Body But only in dry, Such as the Teeth, Gums, Throat, Pallot of the Mouth and Tongue which Occasions a Dryness in the parts when it Settles on the Teeth it causes roughness. In other parts as the Throat causes Siccity or Dryness Draws the Blood from the pallot of the Mouth.

For this the quince Seeds, psyllium Seeds with Aqua Violarum made into a mucilage, a table Spoon per dose and as often repeated as is Necessary . Also the Violet Julep this will Draw and loosen the Tartar and make the parts Lupricus.

You may rub the Teeth with Pulverisd Lapis Pumici and Lapis Concretum which will kill the Dentium Vermis.

If the Tartar Settles in the Stomach, it Creates Fervor Stomachi, heaviness, Faintiness while the Stomach can not Digest.

You must Anoint the pit of the Stomach with Deer's Suet and take pulverised Lapis Cancrorum in Boilt Beer; Dissolves the Tartar (.) Also preservd quinces or calcined Hartshorn.

Purge with Rhubarb, Take it in Aqua Carduus Benedictus After that the Extractum Coralliorum rubarum with the Spirit Vitriolum Prepar'd, the Dose 6 drops Taken in a little wine.

The Tartar also Sticks to the Entrails and Coagulates which Creates Colicks, Costiveness (,) Burning in the Entrails and Stool, Great Thirst. Causes also a lameness with overflowing of the Gall.

Inwardly take a few drops of spiritus Therebinthina in a tea made of Mallow and Flax Seeds, Also the poltice of Prepared Margarita and Coralliorum.

Outwardly use a poltice on the Bell, take mullin Leaves, Camomile, Ivy leaves, Boiled and use it warm. Afternoon anoint the parts with

Hare's fat.

When the Tartar Causes an Obstruction in the Liver, Greater Pains, Burning, Stitches, Heaviness, with windy Humours which causes the Belly to Swell (.) For this take Carduus, Betony, Each one hand full, Cichorium leaves 2 hands full, Agrimony one hand full, Polypodium root one hand full, Rhubarb drams ii, Ginger drams iii. Put them in a Vessel and pour on a Gallon water. Boil them well covered till one Quart Wastes, then add a pint of Mild wine to it, and Boil it Again till only one half remains, of this give the patient to drink three times a day warm Sweetened with Sugar Candy.

As also Crude Spiritus Therebinth. Correctus Arcanum, Tartari Vini, Aqua, Salis Tartari, Chicori, Agrimonia, Testa Bovis, Carduus and Rhubarb. The spiritus tartari correcti, pour on Colcothar and Distill it. You may use this Against all Swellings, Dropsies, That Derive from the Tartar.

If the Tartar Settles in the Kidneys and Vesica It Concretes to a stone.

The best remedy for this, is to make a ley (lye) of some of the stones after they have been calcin'd. Then a salt made out of the ley. The dose a few grains. This salt may also be Dissolved with spirit of wine by pouring it on and drawing it of. As often till it is brought into a Liquorum.

You may also dissolve Lapide Lude (,) Crystallo Judaico into a Liquorem.

The best Arcanum is, The Gravel is Sediment of the patients Urine, Gathered for some time, put it in a Crucible and Burnt into a fine Salt, five or six Grains mixt with three parts Absorbentia Given to the patient in Aqua Petroselini and wild Carrot.

If all the Tartar Settles in the Lungs, Creates Violent Coughs, Spitting of Blood, Hectic Fevers, Decay of the Limbs, Asthmas, Corruption.

For this take liquorice Stick, Polipodium root each Six Drams, Cichorium root and Leaves, Rhaponticum each four drams, Carduus one hand full, Small raisins 2 ounces, Fresh Figs 7. Cut in slices, Anise Seeds, Fennel Seeds, Quince Seeds, Portulac Seeds, Violet Flowers, St. Johns wort Flowers, Buglosses Flowers, and Borage Flowers each one handfull. Boil all them in a Gallon water, Till the one half is wasted, Strain it and add a half pint of wine to it, Then boil it a little more and make a half pint with Sugar Candy. Of this taken three times a day warm a half pint at a time's Propatus.

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The Corroding Tartaris Catarrhs are cured in this manner. They must not make use of severe, But moderate means Such as Elder tops Dryed and mixt with Sugar, Taken in the Spring in the month of May The dose from 1 to 2 drams.

The Leaves of Black Hellebore mixt with sugar Pulverised, taken from 12 to 20 or 40 Grains.

Also Carduus, Radix Iris Nostras made into a powder. The dose from 20 to 40 grains. You may also use Oleum Antimoni, a few grains per dose. After purging make a tea of Spignel roots and mix Centaury Juice with it.

The Podagricus and Chiragricus Catarrhs are cured with Scamoni Hermodact, Turbith, Vegetabilia Sena, mixt with Fine Sugar Equal Quantity. The dose a half dram morning and Nights.

Outwardly apply Mercur. Sublimat., Aqua Fortis, Arsenic Ana (in equal parts. Ed) Fac. Pulmentum. This lay on the Effected parts, But if the whole member is Effected, Then Chuse the Suitablest part to lay it on. After that Apply Something to Clear the Eschara. Then make use of the Following:

Attractivum Emplastrum, Rx Min ii, Lithargy, Calamine, Carab Magnotes, ana half pound all to be pounded and siv'd. Boil it in Oleum Lini 6 pounds, wax 4 pounds, Turpentine 2 pounds, Vernix one pound to the Consistence of a Brown plaster, then mix into it Gumm Opopan, Galbanum, Serapo, Bedellium, Ammoniae Ana half a pound., Boil it a little more and add to it Carab Mastich, Thur, Magnet, Myrrh, Aloe Hepatic, Ana A quarter of a pound, pounded fine and mix it to a Consistence by Malaxation. By this all Tartaris Catarrhs and Corrosive waters are drawn of (,) when this is Done Strew the Pulvis Crocus Martis in the Wound and Heal it. All Podagricus and Chiragricus Ought to be well purged with this Arcane Corallium which is the Mercurius Sublimatous Rubens non Corrosivus. This Ought to be made use of, According as the Podagricus has root 6 or 7 times.

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If the Tartar Settles in the Gall, It Causes Yellow Fevers, Icterus Flavus Et Icterus Nigri and Overflowing of the Gall.

A Tea made of Fragaria and Taken is very good, Also white Cichorium, Liquorits Stick, garden Rhubarb, Cinnamon Bark, Andive, Adiantum Album, Fumaria, Eryngium, pound and mix them, and on a table spoon full of this mixture pour a pint boiling water(,) make it Palatable. Also Spiritus Terebinthina Correcti, Taken from 10 to 12

drops. If the Tartar Settles in the Spleen Causes Pleuritic pains at the left side, Erysipelas, Fevers, Pains, Swellings, Windy Humours, Asthmas, Anxieties of the Heart, and at Last Melancholia, hypochondriaca and Mania.

Take Calcined Ocul Cancrorum with Spiritus Vini and a few drops of Spiritus Vitrioli Dulcis mixt with it and Taken —

Take Polypodium Cichorium, Radis. Florentina, Cortex Tamarisci, Carduus, Spleen wort, Folia Sena, Rhubarb, Ginger peel, and make a Tea and drink it on the above pulvis.

If The Tartar Settles in the Blood and Medulla or Marrow Causes Scorbutus, Itch, all sorts of Fevers, Serpigo, Tetter or Ringworm and other inward Serositas.

It is Evident that the Three Principia which are in the watery Elements are Likewise in the Blood of Genus Humanum.[1]

Outwardly you may apply an ointment made of Althea, Terebinth, gummi Ponax, Eggs, and oleum Hyperic.

Inwardly, take a tincture made of theriac 1 ounce, Myrrh, saffron, ana 2 drachms, liquorice stick and pepper ana and 1 drachm. Pound them all fine and pour on one pint of v(in.) R(ect.). Digest the same for four days , The dose a teaspoon full in a glass of wine every hour till you perceive a moderate sweat.

A tea made of Garden Scurvy Grass, Spring Scurvy Grass, Mustard, Horse Radish and Columbines.

This Disease is very Ketching.

The Colour of the Urin is of a Dark Brown.

If the patient is inclined to the piles, it is Best to Cleanse him that way By a Moderate purge of Aloes and Rhubarb.

Also to be bled in the Left arm in the Vena Mediana or a head Vein. The Orifice must be large that the Thick Blood may Evacuate....

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The Tartar that Settles in the Privities Causes Ulcers in the parts (,) Swelling of the Arteries in the Privities, Potex and Thighs. For this take Sp. Terebinthina 12 or 16 drops in a tea made of Mugwort In the morning Fasting. Externally Beta rubra rapt up in (?) and roasted in hot ashes and made into a plaster and apply it to the parts. Also oatmeal boiled to the Consistence of a plaster and apply'd is very good.

1. The following is the literal German translation, which indicates a more closely Paracelsian orientation: In the blood of the microcosm (*kleine Welt*) we find the three Principia as they are in all flowing waters of the macrocosm (*grosse Welt*).

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In Tartaris Diseases, the patients Should not be purged nor Bled without Necessity requires it, but Diaphoretic Medicines and such as will create a Gentle Moistness. Use an oil made of Colcothar Vitrioli the dose 3 drops Taken in wine is protection against the Gravel and Stone.

Columbines, Carduus, Cichorium, Viscus quercinus, radishes, Horse radish, Elecampana, Rhubarb, Agrimony, Ground Ivy, Betony, Mullin Blossom, Petroselini, Anise, Fennel, Athea, Camomile, Flax Seeds, Juniper Berries, Mis F. into Tea. The Steam of a Bath made of ashes and Salt with hot water. Lapis Cancorum, Oborum T esta, Tartarous Vini, F. Pulvis.

These three Following Herbs are Excellent in Tartarous Diseases(:) Cichorium, Ononis and Carduus Benedictus.

In summary, in terms of clinical practice and training, Abraham Wagner and George de Benneville were clearly representative of the colonial physician of the first two thirds of the 18th century. In their natural philosophy , the evidence suggests that they stood in a European tradition of medical reform linked to their religious dissidence. They were experienced practitioners with a known grounding in the materia medica and some of the pharmaceutical trends then current. Even the limited evidence we have of their therapeutics and prescribing suggests how American physicians trained at the end of the early modern era tried to combine their theoretical insights with changing paradigms, and ethical mandates with their clinical decisions. Admittedly, we suffer from a lack of daybooks or similar material from trained German medical providers in North America. We hope, nonetheless, that the extraordinary manuscript materials we have discussed and in a small part illustrated in this paper can yield some insight into the question of actual practice versus medical theory and may support some cross-cultural comparison within the American setting.[53]

53. See on this subject above all John Worth Estes, "Therapeutic Practice in Colonial New England," whose pathbreaking research and personal interest contributed much to our work. The authors wish to dedicate this paper to his memory.