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God's Invisible Particles as an Explanation for the Rinderpest Outbreak (1713–1714): The Reception of Medical Knowledge in the Dutch Republic

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Abstract

In recent decades, historians have made significant contributions to the understanding of the production and circulation of knowledge in the early modern period. This article aims to go further, by demonstrating how a non-medical expert acquired and applied new medical knowledge, and how chronicles can be used as a source to study the reception of (medical) knowledge in the early modern period. To do this, I have used the corpus of the research project *Chronicling Novelty* which contains 311 early modern chronicles from the Low Countries, written by a heterogeneous group of authors from the 'middling' ranks of society. The farmer and alderman Lambert Rijckxz Lustigh (1656–1727) tried to make sense of the rinderpest outbreak that spread across the Low Countries in 1713. In contrast to most of his contemporaries, he combined a corpuscular theory of medicine with other forms of knowledge to demonstrate how God's 'invisible particles' caused an epidemic. This paper presents how expert knowledge became part of a complex chain of cultural translation and retranslation in society. Moreover, by examining Lustigh's explanations in relation to his contemporaries and other chroniclers, this paper offers an additional perspective on the preconditions for the acceptance of new knowledge and change among the middling ranks of society.

Keywords

chronicles – rinderpest – reception – knowledge – Low Countries – medicine – non-experts – corpuscular philosophy

1 Introduction

In the small Dutch village of Huizen in 1713, a farmer and alderman (*schepen*) tried to make sense of a rinderpest (cattle plague) outbreak that had spread across the Low Countries.¹ In order to do so, Lambert Rijckxz Lustigh (1656–1727) kept a chronicle in which he recorded all the information that could help him to stop the epidemic.² Without receiving any (medical) training at a university, he conducted his own research by making observations, by reading and by talking to ministers, officials, and other farmers. The result is a manuscript that allows us to explain how non-medical experts, belonging to the ‘middling’ ranks of society explained epidemics, and to what extent they were able to appropriate (new) medical knowledge.

In recent decades, historians of science have made significant contributions to the understanding of the production and circulation of knowledge in the early modern period. Especially since the 1990s, they have broadened their scope of inquiry, resulting in studies on the ‘daily practices’ and ‘everyday knowledge’ of practitioners and intellectuals.³ This article proposes to go further, by demonstrating not only how a non-medical expert acquired new

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- 1 This article is based on the research paper: “Chronicling Epidemics. The relation between medical knowledge and religious practices among non-medical experts in the Low Countries, 1500–1850,” that I presented during the EAHMH biennial conference: Faith, Medicine, and Religion on 10 September 2021. This article differs from my initial presentation to the extent that I elaborate one specific case study to investigate the reception of (new) medical knowledge in the early modern period. However, a contribution closer to my original presentation will be published at the end of 2022 under the title “Coping with Epidemics in Early Modern Chronicles. Low Countries, 1500–1850,” in the series *Disaster Studies: Historical and Cultural Perspectives* (Amsterdam University Press) edited by Lotte Jensen.
 - 2 Lambert Rijckxz Lustigh, “Kroniek van Lambert Rijckxz. Lustigh Te Huizen Voornamelijk Betreffende Gooiland, 1713–1722” (Huizen, 1722), Inventarisnummer 1527, Noord-Hollands Archief, Haarlem.
 - 3 Pamela O. Long, *Artisan/Practitioners and the Rise of the New Sciences, 1400–1600* (Corvallis, OR, 2014); Elaine Yuen Tien Leong, *Recipes and Everyday Knowledge: Medicine, Science, and the Household in Early Modern England* (Chicago, IL, 2018); Martin Mulrow and Lorraine Daston, “History of Knowledge,” in *Debating New Approaches to History*, ed. Marek Tamm and Peter Burke (London, 2019), 159–179; Peter Burke, *What Is the History of Knowledge?* (Cambridge, 2016).

medical knowledge, but also to consider how chronicles can be used as a source to study the reception of (medical) knowledge in the early modern period.

By demonstrating how corpuscular medical knowledge had reached Lustigh in the small village of Huizen, we find that such knowledge travelled on not just a one-way street from experts and scholars to society at large. Knowledge was in constant motion and moved into many directions, often losing much of its original form in the process. In other words, this is not a history of knowledge based on a model of diffusion, but one which studies the multidirectional transfers between actors and media, and the complex chains of cultural translation and retranslation.⁴

To meet these study objectives, I have used the corpus of the ongoing research project *Chronicling Novelty: New knowledge in the Netherlands, 1500–1850*, directed by Judith Pollmann (Leiden University) and Erika Kuijpers (Vrije Universiteit, Amsterdam). It contains 311 handwritten chronicles from the Low Countries written between 1500 to 1850. Based on this dataset written by a heterogenous group of authors, it is possible to study how they explained diseases and epidemics, and how that changed over time. They all used natural explanations for epidemics alongside divine explanations, with a focus on the Hippocratic-Galenic non-naturals.⁵ Prior to the development of the smallpox vaccine in the late eighteenth-century, however, Lambert Rijckx Lustigh was the only chronicler who went a step further. Lustigh used both new medical knowledge and his own observations to study the rinderpest outbreak. He attributed the cause of infection to invisible particles, based on corpuscular and atomistic philosophies. The fact that Lustigh was the only chronicler in the corpus who explained diseases in this way raises questions about the reception of natural philosophical ideas in society at large, especially when they are associated with the new ‘mechanical philosophy’ and the Scientific Revolution. Therefore, I will use this case study to demonstrate to what extent new medical knowledge was put into practice by a non-medical expert such as Lustigh, and to what extent his contemporaries regarded his research and conclusions as useful.

I will first discuss how chronicles can be used as a source for the reception of novelty and (new) knowledge. I will then explain how the rediscovery of

4 Simone Lässig, “The History of Knowledge and the Expansion of the Historical Research Agenda,” *Bulletin of the GHI Washington*, 59 (2016), 43; Burke, *What Is the History of Knowledge?*, 41.

5 The Hippocratic-Galenic non-naturals were behavioural and environmental and comprised air, sleep and waking, food and drink, rest and exercise, excretion and retention, and the passions (including sex).

atomistic ideas by (medical) scholars in the second half of the seventeenth century resulted in a new ontology to explain diseases. Next, I will demonstrate how this knowledge reached Lustigh and how he put it into practice. Finally, I will examine what were the reactions of his contemporaries and to what extent Lustigh's explanations differed from those of other chroniclers.

2 Early Modern Chronicles as a Source for the Reception of Medical Knowledge

The historians Judith Pollmann (2016) and Brodie Waddell (2018) have drawn attention to the emergence, from the late Middle Ages until well into the nineteenth century, of local or 'personal chronicles', written by the 'middling' ranks of society.⁶ Chronicles have been written since Antiquity and are especially studied for the medieval period. However, in contrast to their predecessors, early modern chronicles were more concerned with the present than with the past. They were outward-looking, designed to be useful to family members, neighbours, and future generations.⁷ According to Waddell, it was a social writing rather than 'ego-literature'. It was written about – and usually for – a wider community rather than the 'individualist self'.⁸ Despite their importance for the local community, only very few chronicles were published during the lifetimes of their authors. Moreover, they were, and are, scattered across personal and local archives, meaning that they have received little or no attention from historians.⁹

According to Pollmann, chroniclers were almost exclusively used as a source of information on local history. Moreover, they were seldomly studied in a comparative way.¹⁰ In an attempt to redress the balance, she constructed the *Chronicling Novelty* project together with historian Erika Kuijpers. Since 2018, the team have collected 311 chronicles from 43 local archives, written by 226 different authors, on 93 unique localities.¹¹ With a community

6 Judith Pollmann, "Archiving the Present and Chronicling for the Future in Early Modern Europe," *Past & Present*, 230 (2016), 231–252; Brodie Waddell, "Writing History from Below: Chronicling and Record-Keeping in Early Modern England," *History Workshop Journal*, 85 (2018), 239–264.

7 Pollmann, "Archiving the Present and Chronicling for the Future," 232; Waddell, "Writing History from Below," 241.

8 Ibid.

9 Ibid., 244. Pollmann, "Archiving the Present and Chronicling for the Future," 232.

10 Ibid.

11 The number of chronicles per period is given here in parenthesis as follows: 1450–1500 (1); 1500–1550 (7); 1550–1600 (42); 1600–1650 (20); 1650–1700 (39); 1700–1750 (27); 1750–1800 (70); 1800–1850 (86); 1850–1900 (19).

of 528 transcribers on the citizens' science platform 'VeleHanden', and the *Handwritten Text Recognition* software of *Transkribus*, we created a digital corpus to study the reception of new knowledge in the Netherlands between 1500 and 1850. Because the process of transcriptions are not yet complete but rather ongoing, I used a subset of 250 chronicles written by 186 different authors for this specific case study.

This collection of manuscripts was written by both men and women from the Northern and Southern Netherlands. Most were written by men with some measure of local authority. During precarious times, however, other contemporaries from various backgrounds also maintained a chronicle. The practice seems to have enabled them to keep some measure of control in their lives, and to help make sense of what was happening around them.¹² In contrast to the records kept by experts such as scholars and practitioners, these chronicles were maintained by farmers, tax collectors, merchants, artisans, and local officials from small communities, who recorded everything they regarded as useful. They wrote down events and experiences as and when they occurred, or shortly afterwards, and this allowed them to reflect upon the significance of events as they unfolded. We can therefore study the explanations that this group of non-medical experts offered for various phenomena and events, which includes critical comments on (local) authorities and knowledge practices. Since they were, in general, never intended to appear in print, (self-)censorship will have played only a minor role.

As a result, chronicles are a viable source for the study how the authors reflected upon experiences that they believed were worth recording, and what they understood by the idea of knowledge. Departing from this perspective, we could, on the one hand, study chronicles as the local archive of the author, and therefore as a collection of useful knowledge that could be deployed in the future.¹³ On the other hand, it is a source wherein we could study the interaction between different types of – and claims to – knowledge, and the process of negotiation between different and opposing understandings of knowledge.¹⁴ Before I discuss these elements in Lustigh's chronicle, we will first look at the rediscovery of corpuscular ideas in relation to medicine.

12 Pollmann, "Archiving the Present and Chronicling for the Future," 239, 243; Beatrice de Graaf et al., "Dancing with Death: A Historical Perspective on Coping with COVID-19," *Risk, Hazards & Crisis in Public Policy*, 12 (2021), 352, 357.

13 Pollmann, "Archiving the Present and Chronicling for the Future," 234.

14 Lässig, "History of Knowledge," 39.

3 The Rediscovery of Corpuscular Philosophy

In the 1660s, when the microstructure of matter gained prominence in natural philosophical debates, the term ‘atomism’ was introduced for the first time. In the period before – especially since 1400 – an increasing number of scholars in their writings came to invoke atoms, corpuscles, particles, minima, or other invisibly small structures. However, they were defined in so many radically different ways, that it is implausible to view them as belonging to the same category. It was only in the second half of the seventeenth century that ‘atomism’ was taken to be so central a consideration as to define an entire school of thought, and only in the nineteenth century did it become prominent, by which time it was hailed as part of the new ‘mechanical philosophy’.¹⁵

Currently, the term ‘atomism’ is commonly used not to designate a homogeneous philosophical current, but rather a large variety of doctrines, all somehow based on the idea that the ultimate constituents of matter are small, indivisible particles.¹⁶ These ‘atoms’ are derived from the Greek word ‘atomos’, which means ‘indivisible’, and is rooted in the works of the first atomists: Leucippus, Democritus, and Epicurus. They theorized that the two fundamental constituents of the natural world are atoms (i.e., indivisible bodies) and void, both of which were ungenerated and indestructible.¹⁷ Lucretius (ca. BCE 94–ca. BCE 50), who left the most complete source of Epicurean philosophy, changed the characteristics of Epicurus’ atoms. Besides the physical features, he also ascribed biological properties to them, for which he used the Latin term: *semina rerum* (i.e., seeds of things).¹⁸

With the rediscovery of Lucretius’ *De rerum natura* in a monastery near Lake Constance in 1417, Renaissance scholars were able to enlarge upon his ideas and develop them further. Combined with the demands of Aristotelian, Platonic and Christian traditions, this led to some innovative combinations of atomists’ notions and vitalistic theories to explain diseases and epidemics.¹⁹ One of these explanations held that *semina* were invisible, active living

15 Christoph Lüthy, “Atomism in the Renaissance,” in *Encyclopedia of Renaissance Philosophy*, ed. Marco Sgarbi (Cham, 2018), 1–2.

16 Elena Nicoli, “The earliest Renaissance commentaries on Lucretius and the issue of atomism” (Nijmegen, 2017), 3.

17 Ibid.

18 Lüthy, “Atomism in the Renaissance,” 10.

19 Nicoli, “Earliest Renaissance commentaries,” 5; Marco Beretta, “The Revival of Lucretian Atomism and Contagious Diseases during the Renaissance,” *Medicina Nei Secoli*, 15 (2003), 134.

particles of matter endowed with a soul.²⁰ Through a combination of putrefied soil and certain atmospheric conditions, they could become pestilential and the cause of disease.²¹

The most influential scholar who developed Lucretius' ideas into a consistent theory was the Italian physician Girolamo Fracastoro (ca. 1476–1553). In his tracts *Syphilis sive morbus Gallicus* (1530), *De sympathia et anipathia rerum* (1545) and *De contagione* (1546), *semina* received a clear corpuscular interpretation which contributed to the development of atomism in two different ways. The first, which focused on units of matter as agents of contagion, stimulated the interpretation of chemical and biological phenomena in terms of the addition and subtraction of corpuscles. Second, the notion of *semina* contributed to the emergence of the interpretation of atoms as corpuscles, endowed with force and formative power which was fundamental to a large part of seventeenth-century theories of matter.²²

The novelty of Fracastoro's explanation of diseases lies in his corpuscular theory of matter. Most medical practitioners and chroniclers explained epidemics through miasmatic vapours which could be transferred by direct contact, at a distance, and through fomites such as clothing, sheets and (wooden) furniture. Fracastoro agreed that miasmatic vapours could produce pathological changes, but insisted, however, they did not start contagions. That was caused by the 'seeds' which were carried through the air. In other words, Fracastoro added a layer of complexity whereby the 'seeds' travelled in corrupted air which could be absorbed by an individual through inhalation, for example.²³

These invisible particles – or *semina* – described by Fracastoro could be produced in the sky when atmospheric conditions were favourable for their propagation. Once they had penetrated their host, these corrupted particles could multiply, bringing about the putrefaction of humours. The resulting imbalance led to an excess of bodily fluids and therefore sickness. What followed from Fracastoro's idea of *semina* was a new ontological theory of disease and an important contribution to discussions on the transmission and causes of disease.²⁴

20 Titus Lucretius Carus, William Ellery Leonard and Stanley B. Smith, *De rerum natura libri VI* (Madison, WI, 1942), 655–666, 769–830, 1090–1137.

21 Antonio Clericuzio, *Elements, Principles, and Corpuscles: A Study of Atomism and Chemistry in the Seventeenth Century* (Dordrecht, 2000), 13–14.

22 Ibid., 10.

23 John Henderson, *Florence Under Siege: Surviving Plague in an Early Modern City* (New Haven, CT, 2019), 53–54; Beretta, "Revival of Lucretian Atomism," 148–149.

24 Clericuzio, *Elements, Principles, and Corpuscles*, 17.

The radical novelty of Fracastoro's theory has often been overstated by historians who have perceived in it an anticipation of nineteenth-century bacterial germ theories of disease.²⁵ Although the historian Vivian Nutton convincingly argued that Fracastoro's theory was easily subsumed into the Hippocratic-Galenic system of interpretation, his claim that it is hard to trace the medical influence of Fracastoro beyond 1650 may have to be revised.²⁶ For seventeenth-century Dutch physicians such as Johan van Beverwijck (1594–1647) and Willem Swinnas (1620–1672), Fracastoro's and Lucretius' work remained an important source of inspiration.²⁷ Fracastoro's influence and ideas, moreover, were even appropriated by non-medical scholars such as the chronicler Lustigh.

4 Pestilence as a Particle from God

In 1713, Lustigh embarked on a serious undertaking to understand the causes and diffusion factors of the rinderpest outbreak in the small village of Huizen, 30 kilometres south-east of Amsterdam.²⁸ In order to do so, he maintained a chronicle in which he recorded everything he observed that might offer clues as to how best to stop the epidemic. In contrast to medical treatises and pest ordinances with a strong focus on natural causes, Lustigh's manuscript offers a wide range of divine, cultural, and natural factors that he related to the cattle plague. As a result, in addition to showing the status of his medical knowledge, his chronicle provides insights into the cultural meaning and religious significance of epidemics in an early modern society.

25 Michael Worboys, "Contagion," in *The Routledge History of Disease* (Abingdon, 2016), 74.

26 Vivian Nutton, "The Reception of Fracastoro's Theory of Contagion: The Seed That Fell among Thorns?," *Osiris (Bruges)*, 6 (1990), 234; idem, "The Seeds of Disease: An Explanation of Contagion and Infection from the Greeks to the Renaissance," *Medical History*, 27 (1983), 1–34.

27 Willem Swinnas, *De pest-stryt, beharnast met veel voor-treffelyke genees-middelen* (1664); Johan van Beverwijck, *Schat Der Ongesontheyt, Ofte Genees-Konste van de Sieckten* (1642).

28 For more information on the eighteenth-century rinderpest, see Filip Van Roosbroeck, "To Cure Is to Kill? State Intervention, Cattle Plague and Veterinary Knowledge in the Austrian Netherlands, 1769–1785" (PhD Thesis, University of Antwerp, 2016), 28: "The rinderpest is not a disease which can spread by airborne or vector transmission; instead, it is spread by close contact with infected animals or their bodily fluids. Although droplets of these fluids may be infectious, a distance of just a few metres is sufficient to safeguard against the risk of infection. In addition, animals which recover from the disease gain lifelong immunity and cannot fall ill again".

In his search for answers, Lustigh consulted various sources, ranging from the Bible, treatises, newspapers, ministers, and villagers, through to his own observations. The constant gathering of evidence and evaluating of his own observations, combined with what he read and heard, has been recorded in his chronicle (Fig. 1). The first part is especially informative. It is addressed to his brother Hendrick Rijckxz Lustigh (1657–1725), who lived in Sneek (Friesland) for several years. Lustigh tried to explain to him what happened during the rinderpest outbreak and what according to him were the best solutions to stop the epidemic. The second part of his chronicle addresses more distinct topics, albeit with fewer comments.

According to Lustigh, the cattle plague was in the first instance caused by God as a punishment for the collective sins of His people. He was no fatal-ist, however. With reference to Ovid (BCE 43-CE 12), Lustigh believed that the

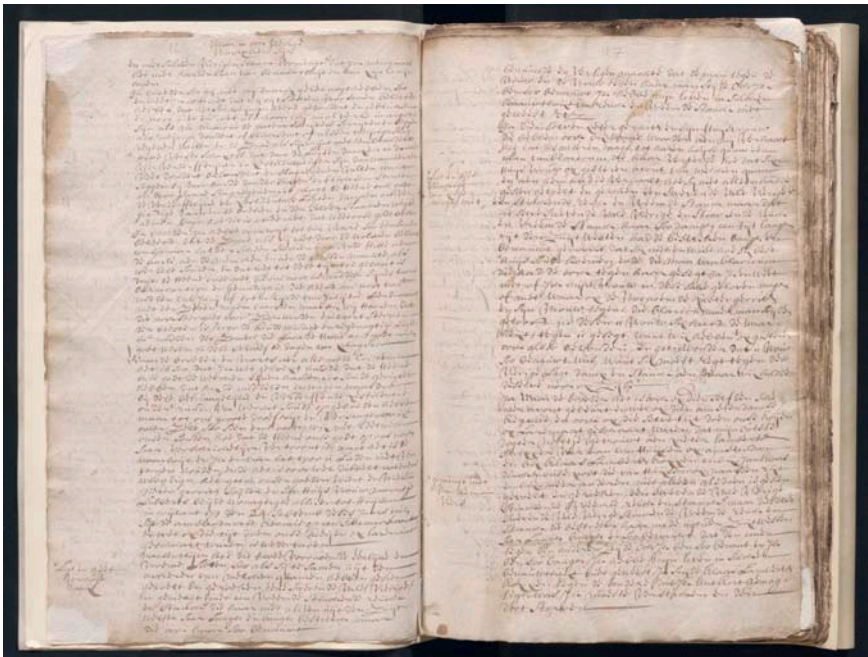


FIGURE 1 An image of Lustigh's chronicle where he wrote on the experiences, reflections, and composition of pestilential air by fellow villagers and natural philosophers.
 SOURCE: LAMBERT RIJCKXZ. LUSTIGH, "KRONIEK VAN LAMBERT RIJCKXZ. LUSTIGH TE HUIZEN VOORNAMELIJK BETREFFENDE GOOILAND, 1713–1722" (HUIZEN, 1722), INVENTARISNUMMER 1527, NOORD-HOLLANDS ARCHIEF, HAARLEM, PP. 16–17.

epidemic was a test as well as a punishment.²⁹ He believed that God would allow humans access to the knowledge needed to stop the plague. Therefore, they should not only pray and repent, but actively try to understand God's plan to guide them to the righteous path.³⁰ Taking the right measures and remedies in honour of God would be rewarded, while a passive attitude or acting out of greed would make the punishment more severe and could even lead to people's death.³¹ Lustigh, who witnessed the dissection of a sick calf with great 'humility', learned how the disease spread through the body, while two farmers who dissected sick cows out of curiosity were punished by God with severe pestilential air and died within a day.³²

In his pursuit of knowledge to stop the rinderpest outbreak, Lustigh tried to understand the mechanism that God used to spread the plague. He conducted empirical research and travelled through Holland to obtain information, because some of his observations could not be entirely explained within the Hippocratic-Galenic framework.³³ In the spring of 1713, Lustigh surmised that the plague was caused by the 'element air'. Yet, it was composed by God in a specific way, and could change under the influence of meteorological phenomena.³⁴ Consequently, one location could be more infectious than another, depending on specific (atmospheric) conditions. Especially during sunrise, sunset, and with the absence of clouds, the air was especially pestilential.³⁵ A clear sky and a powerful sun increased the power and contagiousness of the infected air and often resulted in an enormous stench which was suffocating. Moreover, the corrupted air was often carried by the dew, and when it came into contact with a person's eye, it resulted in a corrosive and burning feeling "as if it bites out our eyes".³⁶

One of the characteristics of the 'corrosive' and 'poisonous' air, according to Lustigh, was that it contained 'fiery sparks' (*vierige vonckxkens/voncken*) which caused the pain in the eyes.³⁷ The physician Van Beverwijck used the same

29 Lustigh, "Kroniek van Lambert Rijckxz. Lustigh," 11: "doet in tijts raat, want die te Langh wagt, komt dick wils te Laat Hierom soo segh Ik oock, soo Imant aen sijne koe beesten gewisse kentekenen van dese beschrijende plage siet, die magh vrijelijck in de name en in d' vreese godts, als dan met den alder eersten wel dese volgende middelen en remedien gebruijken."

30 Ibid., 2, 10, 13–14, 21, 25.

31 Ibid., 11.

32 Ibid., 13–14, 53–55.

33 Ibid., 104.

34 Ibid., 2.

35 Ibid., 3.

36 Ibid.: "dat het was ofte het onse ooggen uijtbijten woude."

37 Ibid., 15–17.

word as a substitute for ‘contagious seed’ in his *Schat der ongesontheyt* (1642) in the section where he referred to Fracastoro.³⁸ Van Beverwijck elaborated on the characteristics of these particles which were of a viscous and sticky nature, and could survive in the air and for more than two years in fomites.³⁹ Lustigh’s description of how the epidemic spread was written along very similar lines.

He argued that the particles causing disease were carried not only in the air, but that God also dropped them on the earth. Afterwards, they ‘adhere’ (*aen-kleven*) to the water and grass, which become contagious (*besmettelijck*). As a result, not only were the people who went outside with bare legs infected, but so too were the cows they attended to milk who breathed the same air and consumed the water and grass.⁴⁰ Noteworthy is the fact that Lustigh remarked that “bare legs [...] were contaminated with great fervour and pain”.⁴¹ Similar to the eyes, the pestilential air caused reactions in the tissue with which it came in contact and could even penetrate the skin.⁴²

This process was described in similar terms by Van Beverwijck, who published extensively on diseases and epidemics. In one of his treatises he wrote:

Such contagious seed is sometimes present in the minds of our body and sometimes in a humour [...] However, the contagiousness of the seed (of which we now speak) requires some extraordinary conditions. We see that it not only penetrates, but also sticks [*aen-kleeft*] to the body. Afterwards under the influence of warmth, it expresses itself and can be transferred to other bodies.⁴³

The influence of warmth described by Van Beverwick is also identified as significant in Lustigh’s observations. The latter relates how several farmers in the villages of Naarden and Hilversum announced that they would stable

38 Beverwijck, *Schat der ongesontheydt*, 533–534: “gelijck Fracastorius getuyght [...] Waer uyt blijktt, datter een vonck, ofte eenigh besmettelick zaet uyt die verrottinge waessem.”

39 Ibid., 533.

40 Lustigh, “Kroniek van Lambert Rijckxz. Lustigh,” 3.

41 Ibid.: “de menschen met hare bloote benen des morgens melckengingen, met groote vierigheijt en serigheijt besmet wierden.”

42 Ibid., 3, 14.

43 Johan van Beverwijck, *Kort bericht om de pest voor te komen. Ten dienste van de gemeente der stad Dordrecht* (1636), 10: “Soodanigh besmettelick saet heeft syn plaetse somtijts in eenige van de geesten onses lichaems/somtijts in eenigh humeur: gelijck sulck onderscheyt blijckt in de pest/pocken/schorft/roode oogen/ ende diergelijcke. Maer in het saet van de pestige besmettelicheyt (daer wy nu alleen of handelen) werden vereyscht eenige bysondere condities. Want wy sien/dat het selve niet alleen haestelick in en dringht: maer oock vast aen-kleeft/ende daer na door wermte ofte anders beroert zijnde sich openbaert/ende andere lichamen mede deelt.”

their cattle earlier in the year – on the last day of October – in the hope that they would not become infected. According to Lustigh, they did not believe that their cattle were already contaminated in the fields, and his attempts to convince them were met with mockery. Once their stock came from the cold autumn air and moved into the warm stables where they stood close together, Lustigh described how the pestilential ‘force’ in the air became activated and revealed itself.⁴⁴ He continued with an analogy wherein he explained that when people work in a cold and pestilential environment and then enter a warm house where the stove was on, they often become sick as well.⁴⁵

Apart from infection through physical contact between bodies and the consumption of contaminated water and grass, Lustigh identified a third cause of infection. He reflected on the case of Cornelis Lambertsz, a farmer who had brought a sick calf to the farm of his associate Gerrit Koemin, where it was housed in a barn separate from that of some other calves. However, the sheds were not completely isolated because there were holes in the partition between them. After four days, the calves of Gerrit Koemin also became sick, because the contaminated calf had infected the air with his breath which had reached the other calves.⁴⁶ Lustigh concluded, therefore, that a (healthy) animal could become infected and contaminated upon exposure to the breath of a sick animal.⁴⁷

When Lustigh continued his research, he realised that it was not just the air that caused the infection, but also what was carried by it. When Gerrit Koemin’s son, Jacob, removed the blisters on the tongue of an infected calf, his hand swelled up as part of the onset of a painful reaction. Lustigh concluded that the infection nestled in the blister on the tongue, which explained why the breath of sick cattle was infectious.⁴⁸ The only two options available to stop the epidemic, therefore, were complete isolation or the killing of the diseased animals. Since he believed the latter to be sinful, the one provision that remained was that people who worked with sick cattle should not come into contact with healthy livestock.⁴⁹ The authorities were responsible for the implementation and should both issue and enforce prophylactic measures. In this way it could be brought about that God would bring the plague to an end.⁵⁰

44 Lustigh, “Kroniek van Lambert Rijckxz. Lustigh,” 23.

45 Ibid.

46 Ibid., 25.

47 Ibid.

48 Ibid.

49 Ibid., 13.

50 Ibid., 10.

The manners of infection described by Lustigh present striking resemblances with descriptions in the works of Van Beverwijck and Swinnas.⁵¹ Both emphasized the importance of air and the role of a living pestilential substance that caused the infection. These are summarized by Swinnas, who argued that the sources of infection are

(1) through physical contact of one body to another, (2) through the intervention of something like beds, blankets of such or, (3) through penetration of the air when *atoms or small indivisible particles* from a contagious body are spread through the air and touch upon a healthy body which they contaminate.⁵²

All three means of infection were mentioned and discussed by Lustigh; all three involved particles that were (indirectly) transferred from one body to another. Lustigh must therefore have been familiar with the medical ideas shared by the Dutch physicians Johan Van Beverwijck and Willem Swinnas. Whilst he never explicitly cited them, it is very likely that he had read their work. Both published in the vernacular, and Van Beverwijck's work especially was widely read. Together with the 'Dutch Homer', Jacob Cats (1577–1660), he worked to popularize his own publications *Schat der gesontheyt* (1636), *Schat der ongesontheyt* (1642), and *Heel-konste* (1645).⁵³ Moreover, they were both *nateurschrijvers* (i.e., natural philosophers) to whom Lustigh referred as his source for theoretical medical knowledge.⁵⁴ Besides the practicalities – the certainty that he had access to their works – the striking resemblance between Lustigh's analyses of the plague, and their corpuscular and atomistic ideas, makes the connection even more convincing. The influence of specific meteorological factors and the idea that there were particles that travelled in (pestilential) air – these were characteristics that the medical scholars Fracastoro, Van Beverwijck and Swinnas all had in common.

51 Nutton, "Seeds of Disease," 25.

52 Swinnas, *De pest-stryt*, 18–19: "Dese besmetting werkt op drierley wijze, ofte door aenraken, wanneer het eene lichaem het andere komt te raeken, ofte door tusschenkomen van yetwes, als bedden, dekens, en diergelijke: ofte door een doordringing van de lucht, wanneer de atomi of kleine ondeylbare affetfeltjens van een vierig lichaem haer selven door de lucht verspreyden een gesont lichaem komen te raeken en te besmetten."

53 Johan van Beverwijck, *Schat Der Gesontheyt* (1636); idem, *Schat Der Ongesontheyt*; idem, *Heel-Konste, Ofte Derde Deel van de Genees-Konste* (1645); Lia van Gemert, "Johan van Beverwijck als 'instituut,'" *De Zeventiende Eeuw. Cultuur in de Nederlanden in interdisciplinair perspectief Jaargang*, 8 (1992), 99–106.

54 Lustigh, "Kroniek van Lambert Rijckxz. Lustigh," 16.

5 Lustigh in Relation to his Contemporaries and Other Chroniclers

Based on his extensive and detailed inquiry, Lustigh wrote three sections of ‘advice and remedies’ to help his fellow citizens.⁵⁵ He listed practical and religious measures side by side, to spread what he had learned about how best to stop the rinderpest outbreak. Although Lustigh’s advice could have been lifesaving, most farmers did not take it as seriously as it deserved to be taken. “[T]hey despise most of my words and council,” he wrote, and described how some even threatened to silence him with violence.⁵⁶ Lustigh, however, did not stop sharing what he had learned, since he believed with God’s grace that he was telling the truth.⁵⁷

On the evidence of his chronicle, Lustigh was terribly frustrated that the implications of his findings were not recognised by his contemporaries. He regarded them as “unwise” and “unwilling to learn,” but he was unable to convince them, despite “the number of examples that he presented”.⁵⁸ It appears that there were other (practical) obstacles to a widespread acceptance of new knowledge. Livestock farmers did their best to protect their cattle with prophylactic measures and remedies, but complete isolation and disinfection measures as prescribed by Lustigh were not feasible for (most) farmers. The time, effort, and space required to construct a safe environment for their cattle was beyond their financial means.⁵⁹

That new medical knowledge would automatically find acceptance was far from self-evident, not only for Lustigh’s local contemporaries, but also for other early modern chroniclers. For most authors, the idea that it was small (invisible) particles in the air that caused an infection, rather than the air itself, was an added layer of complexity that was vindicated only with the practice of vaccination at the end of the eighteenth century. Even during vaccination practices in the nineteenth century, it appeared that chroniclers more frequently used religious causes and Hippocratic-Galenic medicine to explain epidemics, instead of the theory of contagion and germs that would later become the touchstone for ‘modern’ medicine.⁶⁰

55 Ibid., 53–55.

56 Ibid., 57: “maar sij veragten voor het merendeel mijne woorden en raatgevinge.”

57 Ibid., 23, 57–58.

58 Ibid., 29: “soo den onverstandigen en niet leren willende koehouder, hier alsoo mede voortgaat, daar Ik hem noch dagelijckx van segge, ziet de Exempelen en voorbeelden, staat dogh van uw Eijgen verderf af, en Leert hier van.”

59 Ibid., 58–61.

60 Lieuwe Jans de Jong, *De Dagboeken (1825–1855) van Lieuwe Jans de Jong, Boer Te Poppenuizen Onder Oldeboorn*, ed. L. J. de Jong (1998), unpaginated, 07-1851. Worboys,

Although the Hippocratic-Galenic non-naturals remained the most important explanatory devices for the causes of disease between 1500 and 1850, natural explanations for diseases did become more complex and detailed among chroniclers, especially in the eighteenth century. Chroniclers were willing to experiment with new ideas, albeit without abandoning old ones.⁶¹ Yet, these new ideas always remained subordinate to religious explanations. In the end, it was God who as “a merciful father, visited His children with His punishing rod, but nevertheless through the wrath and punishment wants to demonstrate his mercy and to remember His caring will”.⁶²

6 Conclusion

In recent decades historians (of science) have worked hard to forge a new perspective on how practitioners brought expert knowledge into practice. In this paper, I have tried to push this approach further, by looking at non-experts belonging to the middling ranks of society. The result is not a microhistory that focused solely on one individual, but a history of knowledge in which the chronicler Lustigh was compared to 186 non-medical experts who wrote between 1500 and 1850. In the *Chronicling Novelty* corpus, he was the only author prior to the invention of vaccination who wrote that diseases were caused by particles which travelled through the air. By demonstrating how Lustigh combined various types of knowledge, we obtain not only insights into how a non-expert used (new) medical knowledge to make sense of an epidemic, but also to what extent expert knowledge was regarded as ‘useful’ by the rest of society.

The idea that diseases could be caused by infected particles was already proposed by scholars such as Lucretius and Galen. The notion of *semina rerum* was developed into a consistent theory by Fracastoro, who – like Van Beverwijck – worked in Padua. The latter published Fracastoro’s notion of the

“Contagion”; Samuel K. Cohn Jr., *Cultures of Plague: Medical Thinking at the End of the Renaissance* (Oxford, 2009), 139. Frank Martin Snowden, *Epidemics and Society: From the Black Death to the Present, Open Yale Courses Series* (New Haven, CT, 2019).

61 De Jong, *De Dagboeken*, unpaginated, 07-1851; Jan Kluit, “Historische Jaerboeken Der Stad Briel. Vol. 1” (Brielle, 1756), toegangsnummer 501, inventarisnummer 1, Streekarchief Voorne-Putten Rozenburg.

62 Albert Pietersz. Louwen, “Kronijk Der Stad Purmerende Bevattende Der Selver Opkomste En Voortgang, in Handschrift Door Albert Pietersz. Louwen, 18e Eeuw, Deel 2, Eerste Gedeelte” (Purmerend, 1791), 296, 143, Collectie van A. Pietersz. Louwen, inventarisnummer 19, Noord Hollands Archief, Haarlem: “eene Barmhartige Vaeder, die zijne Kinderen wel met zijne Tugtroede bezoekt, maar nochthans, in de Toorn en Straffe, zijne Genade wil bewijzen, en des ontferme wil gedenken.”

'seeds of disease' in self-help manuals, which were widely read thanks to Van Beverwijck's collaboration with the poet Jacob Cats. However, this did not mean that people knew the work in detail or accepted its claims in their entirety.⁶³ It seems that most non-experts focused on his practical advice and remedies, instead of studying the exact mechanisms by which the disease spread.⁶⁴

As a result, the reception of abstract (medical) theories among the middling ranks of society was not self-evident. Only a few chroniclers, and especially only since the eighteenth century, presented alternative explanations for diseases. For most people, the extra layer of complexity whereby diseases were caused by 'seeds' that travelled in corrupted air, was unnecessary to explain the observed phenomena. Despite all the evidence presented by Lustigh, his contemporaries remained unconvinced. This refusal of Lustigh's theory was not only based on the failure of 'rational' considerations, but also on the practical implication it could have had – and the expenses they could have incurred – if they had accepted his theory, his advice, and remedies.

To a certain extent, Lustigh's medical ideas made him unique because, in his explanation of the rinderpest outbreak, he combined expert knowledge based on corpuscular and atomistic philosophies, empirical research, and the Bible. This demonstrates that the dissemination of expert knowledge through society was often far from straightforward. When it was appropriated, it could lose much of its original form as it became part of a complex chain of cultural translation and retranslation. Even contested philosophical notions on particles (e.g., atoms), could lose their controversial connotations in the daily practice of explaining epidemics. Lustigh's example also shows that studying the circulation of knowledge should not stop with its use by experts. By investigating a corpus of the works of non-experts as well, we could trace how and what type of knowledge was used, changed, and passed on by society, each time in slightly new and different configurations.⁶⁵

Early modern chronicles written by the non-experts from the middling ranks of society can play an important role in this type of research. Although Lustigh's beliefs were rather unusual compared to his contemporaries and the rest of the corpus, it is likely that there were others with similarly unexpected combinations of thought. The practice of studying events and phenomena in

63 Theo Verbeek, "Beverwijck, Johan Van (1594–1647)," in *The Cambridge Descartes Lexicon*, ed. Lawrence Nolan (Cambridge, 2015), 67–68.

64 See also the work of the chronicler Pieter van Godewijck who published a medical treatise of Van Beverwijck in rhyme: Godewijck, *Remedie voor de pest* (1636).

65 Philipp Sarasin, "More Than Just Another Specialty: On the Prospects for the History of Knowledge," *Journal for the History of Knowledge*, 1 (2020), 3.

relation to each other was core business for the chroniclers. Especially in precarious times, chroniclers were looking for answers to understand and explain what happened in the world around them. During this quest, they used and reflected upon all the useful information they could find. By creating their personal collections of knowledge, they also offer a fantastic resource to historians who wants to study the acceptance of (new) knowledge and the experience of change in early modern society.

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