FLATUS AND NEEDLES: THE FIRST EUROPEAN BOOK ON ACUPUNCTURE AND ITS INFLUENCE

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ABSTRACT OR EXECUTIVE SUMMARY

This thesis explores the circulation and reception of acupuncture and moxibustion in early modern Europe, focusing on the publication *Dissertatio de Arthritide* by Williem ten Rhijne. This work, recognized as the first European discourse on acupuncture, emerges from Rhijne's encounter with Eastern medical practices during his assignment in Japan by the VOC, and his subsequent attempts to integrate these practices within the framework of European medical knowledge. The thesis interrogates how acupuncture and moxibustion was variably accepted or rejected within European medical circles, reflecting broader dialogues about the adoption of foreign knowledge in a period characterized by both curiosity and skepticism towards the non-European world.

Methodologically, the thesis employs a close reading of primary sources including the *Dissertatio de Arthritide* and contemporary discussions in medical journals and other publications. It also trace the nuanced shifts in medical theory and practice as acupuncture was disseminated across Europe. The analysis spans three chapters, each addressing different aspects of the encounter of Eastern medicine. Chapter 1 discusses the initial European encounters with acupuncture through ten Rhijne's work, setting the stage for further European engagements with Eastern medical techniques. Chapter 2 examines the integration of acupuncture within existing European medical theories, particularly the pneuma and fluid circulation theories prevalent at the time, and how these theories facilitated or hindered the acceptance of acupuncture. Chapter 3 explores the broader intellectual and medical debates that influenced the preference for acupuncture over moxibustion, illustrating the complexities of integrating such practices within the anatomical and humoral theories then dominant in Europe.

The findings reveal a dynamic interplay between acceptance and scepticism, where acupuncture was seen as both a promising new technique and a challenge to established medical doctrines. The thesis contributes to a deeper understanding of the transnational flow of medical knowledge and the contingent nature of its acceptance, anchored in the broader and deeper historical context of the early modern period's scientific life.

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TABLE OF CONTENTS

LIST OF FIGURES, TABLES, OR ILLUSTRATIONS

INTRODUCTION

After 14 years of extraordinary pain from gout, pastor Hermann Busschof (1620-1674) was finally cured in Batavia by an "Indian doctress" [1] using moxibustion, a technique of burning knees and feet with moxa, an indigenous Asian plant with a relaxing smell. This "Indian doctress" was originally employed by Busschof's wife to take care of the slaves to reduce their mortality rate. Initially, Busschof was very hesitant about this alien doctress and her unfamiliar treatments, but gave her a chance because she successfully saved his only daughter from dyspnea (difficulty in breathing). The operation of gout, moxibustion, lasted for less than half an hour and was followed by 24 hours of sleep. When Busschof woke up, the pain had completely disappeared.[2]

Busschof's curiosity towards this technique was aroused.[3] In 1674, when he met with Williem ten Rhijne (1647-1700), a young physician assigned by the VOC(Vereenigde Oostindische Compagnie or Dutch East India Company) from the Dutch Republic to Japan, Busschof highly recommended that he explore this cure against joint pain. This eventually led to the publication of *Dissertatio de Arthritide* (1683), which was the first European book on acupuncture to be widely read, cited and discussed at the time.[4] Before *Dissertatio de Arthritide*, Busschof had also written and published a book on moxibustion but did not mention acupuncture. In contrast, in *Dissertatio de Arthritide*, moxibustion was mentioned but not focused on or recommended.

[1] She came from south-west China, and was mistakenly reported as Indian. Ruben E. Verwaal, "Hippocrates Meets the Yellow Emperor: On the Reception of Chinese and Japanese Medicine in Early Modern Europe" (dissertation, 2009), 2.

[2] Busschof Hermann, *Two Treatises the One Medical, Of the Gout and Its Nature More Narrowly Search'd into than Hitherto, Together with a New Way of Discharging the Same / by Herman Busschof; the Other Partly Chirurgical, Partly Medical Containing Some Observations and Practices Relating Both to Some Extraordinary Cases of Women in Travel, and to Some Other Uncommon Cases of Diseases in Both Sexes by Henry Van Roonhuysen ... ; Englished out of Dutch by a Careful Hand.* (London: H.C, 1676), A2-A3.

[3] Hermann, *Two treatises*, A3.

[4] Harold John Cook, *Matters of Exchange: Commerce, Medicine, and Science in the Dutch Golden Age* (New Haven, CT: Yale University Press, 2008), 339-77.

Why did ten Rhijne write a book on acupuncture after Busschof recommended moxibustion? How did the techniques of burning or needling change as they travelled from China to Japan and Europe? How were the philosophical and physiological theories behind these techniques perceived and interpreted? This thesis will explore the making and spreading of the book *Dissertatio de Arthritide*, aiming to clarify the nuanced journey of acupuncture from its origins to European adoption during the early modern period, emphasizing the variation of acupuncture knowledge in different scenarios, present the interaction between acupuncture and European medical knowledge.

Literature Review

As the first European book on acupuncture, as well as a famous one, *Dissertatio de Arthritide* is a must-mention in all literature on the circulation of acupuncture in early modern Europe. However, these pieces of literature have not developed a linear historiography. I artificially divide the literature into four groups. The first group provides a systematic introduction to East Asian medicine. They often mention the book *Dissertatio de Arthritide* in one or two sentences, marking it as a significant work for East Asian medicine's journey from East Asia to the world. The second group analyzes this book and other acupuncture books from the perspective of European social and cultural context, viewing it as material for exploring early modern Europe's attitude towards East Asian culture. The third group aims to compare traditional East Asian medicine with Western or modern scientific medicine to validate acupuncture. They attempt to find their arguments in the book *Dissertatio de Arthritide*. The first three groups belong to Anglo-American scholarship and present the positioning of *Dissertatio de Arthritide* in the English-speaking academic community, while the authors of the fourth group are mainly East Asian scholars. They strictly compare the acupuncture knowledge in *Dissertatio de Arthritide* with East Asian acupuncture knowledge and the evolution of this knowledge during its dissemination. These documents describe *Dissertatio de Arthritide* from different angles, but

none deeply analyze the relationship between acupuncture and contemporary European medical knowledge, which is the gap this thesis aims to fill.

The first group of literature consists of informative writings with limited length, usually journal articles or book sections, for introducing the key figures and important books. The most informative piece is Chapter 6, "Influences on Other Cultures," from the book *Celestial Lancets: A history and Rationale of Acupuncture and Moxa*. The authors of this book, Gwei-Djen Lu and Joseph Needham, are key scholars in the history of Chinese science and technology. This chapter clarifies the route of transmission of acupuncture and moxibustion from China to Japan, India, and Europe from the 6th century to the 19th century.[5] Another concise work by Elisabeth Hsu highlights that acupuncture as a needle-piercing technique and the theory behind it were transmitted to Europe separately and provided information for both.[6] The author of this article is an anthropologist who writes extensively on Chinese medicine with her analysis regarding the epistemology of acupuncture. Following those works, later scholars can grasp the clues of primary sources. However, these works only provide a few sentences for describing the content of *Dissertatio de Arthritide*, or discussion around it. Instead, they treat acupuncture as a technique in general and place it within the context of many related works on acupuncture.

The second group contextualizes the circulation of acupuncture in European society. Linda Barnes, an anthropologist, writes the first monograph on Chinese medicine in pre-modern Europe: *Needles, herbs, gods, and ghosts: China, healing, and the West to 1848*. By examining extensive texts and diverse activities, she reveals that Chinese healing traditions were imagined by Westerners by racializing, religionizing, and medicalizing China, which formed a part of the

[5] Gwei-Djen Lu and Joseph Needham, "Influences on Other Cultures," essay, in *Celestial Lancets: A History and Rationale of Acupuncture and Moxa* (Cambridge: Campridge University Press, 1980), 262–301.
[6] Elisabeth Hsu, "Outline of the History of Acupuncture in Europe," *Journal of Chinese Medicine*, no. 29 (January 1989): 28–32.

stereotype of Orientals.[7] Roberta Bivins works on the cultural history of 'alternative medicine' from the seventeenth century to the present day and wrote two books and many articles on the topic.[8] Her writings are not only about history but also a reflection on contemporary medical pluralism. Their arguments are inspiring for both non-academic readers and later scholars to understand the interaction between acupuncture and the early modern European medical world. However, these researchers have never opened the package of acupuncture and created a dichotomous discourse: reception or rejection, understanding and misunderstanding. The subtle or dramatic changes of the technique and the theory of acupuncture in the circulation process have not been discussed in detail.

The third group demonstrates sophisticated thinking on time-honoured Chinese medicine using comparative methods, in which the intellectual history of Chinese medicine can be related to the established historiography of the history of Western medicine. Alexander Macdonald compares the system of acupuncture with modern scientific medicine, and concludes that "acupuncture has nothing to do with parapsychology, occult influences or 'psychic powers'…and does not contradict the findings of modern medicine."[9] Shigehisa Kuriyama compares Greek medicine and Chinese medicine and points out that although human bodies are similar, the conceptions of the body diverge because the sign systems are different in different cultures.[10] Given the situation that the history of Western medicine has been much better developed than non-Western medicine in the Anglo-American academic world, comparative

[7] Linda L. Barnes, *Needles, Herbs, Gods, and Ghosts: China, Healing, and the West to 1948* (Cambridge: Harvard University Press, 2005), 1-7.
[8] Two books are *Acupuncture, Expertise, and Cross-Cultural Medicine* (New York: Palgrave, 2000) and *Alternative Medicine?: A History* (Oxford University Press, 2010). Below are selected articles on the topic "Expectations and Expertise: Early British Responses to Chinese Medicine," *History of Science* 37, no. 4 (1999): 459–89, https://doi.org/10.1177/007327539903700404. "Imagining Acupuncture: Images and the Early Westernization of Asian Medical Expertise," *Asian Medicine* 7, no. 2 (2012): 298–318, https://doi.org/10.1163/15734218-12341255."The Needle and the Lancet: Acupuncture in Britain, 1683–2000," *Acupuncture in Medicine* 19, no. 1 (2001): 2–14, https://doi.org/10.1136/aim.19.1.2.
[9] Alexander Macdonald, *Acupuncture from Ancient Art to Modern Medicine* (London, UK: George Allen&Unwin Ltd, 1982), 170.
[10] Shigehisa Kuriyama, *The Expressiveness of the Body and the Divergence of Greek and Chinese Medicine* (New York: Zone Books, 1999), 271-3.

studies might be the most effective way for readers to understand non-Western and non-modern medicine deeply. Scholars also benefit from comparative research, especially their translation of concepts and abstracts. However, these comparative studies often restrict their materials on Chinese medicine to early modern times but assume a continuity from 100 BC to the present day.

The fourth group consists of works outside of Anglo-American scholarship, which investigates rich primary sources from Japan and China and holds different academic concerns from all three groups mentioned above. The German Japanologist Wolfgang Michel (1946-) is the most important scholar to refer to. He writes extensively on the medical interaction between the East and West. Born in Germany and working in Japan, most of his publications are in German or Japanese, and some have been published in English. Another scholar is GAO Xi, who previously worked on the reception history of Western medicine in China and recently started to study the Western transmission of traditional Chinese medicine. All her publications are in Chinese. The Anglo-American academic world has not much noticed their research. The most important reason should be that their working language is not English. Besides that, their academic concerns are also different from those of the Anglo-American scholarship. Both Michel and Gao want to position the non-Western regional medical heritage in the global world. Michel carefully distinguishes the differences between Chinese medicine and Japanese medicine in early modern times, which are usually neglected by scholars, emphasizing Japan's importance in the exchange of 'eastern' and 'western' medicine.[11] Gao sets one of her research goals as "understanding Western common sense on traditional Chinese medicine" and attempts to provide some inspiration for the further globalization of today's TCM (Traditional Chinese

[11] Wolfgang Michel, "１６〜１８世紀のヨーロッパへ伝わった日本の鍼灸 [Japanese Acupunture and Moxibustion in 16-18th Century Europe]," *全日本鍼灸学会雑誌[Journal of the Japan Society of Acupuncture]* 61, no. 2 (2011): 162.

Medicine).[12] To make the argument about the position of Japanese medicine or Chinese medicine in the global world through studying the history of early modern Europe, both Michel and Gao choose to look into the medical knowledge closely and examine the variations. However, this group of works tends to emphasise the importance of national medical heritage and narrate the story of how the Japanese/Chinese created/improved the techniques and how Europeans adopted parts of them, without mentioning the new elements and considerations during the circulation.

I have only listed the most representative works for each group and the above research is an important reference for my thesis. The studies above established that it was during the 16th-18th centuries that Europeans first encountered acupuncture (and moxibustion) and the *Dissertatio de Arthritide* is the first and most important book throughout the whole discussion; the second group provides rich information and various perspectives regarding the social context of the circulation of this book; the third group has made cautiously considerations when choosing English words for Chinese medical terms; the fourth group partially presents the variations of acupuncture between China, Japan, and Europe.

However, the detailed changes and theoretical concerns during the circulation of knowledge about acupuncture have not been fully revealed yet, and this is the focus of this thesis. Based on the close reading of *Dissertatio de Arthritide* and the follow-up discussion around it, this thesis compares its contents with medical teachings from both Eastern Asian and European sides in the early modern period, displaying the dynamics in evaluating foreign knowledge among European medical intellectuals.

[12] Xi GAO, "新术还是旧技：十九世纪前欧洲知识界的中医认知 [New Technique or Old Technique: Perceptions of Traditional Chinese Medicine among European Intellectuals Before the Nineteenth Century]," *光明日报[Guangming Daily]*, January 16, 2019.

Sources and Methodology

The most important source of this thesis is a digital copy of *Dissertatio de Arthritide* from Early Books Online. It was digitalized in 2020 from a physical copy held in the Bodleian Library[13]. This copy was originally published in London in 1683 with Impensis R. Chiswell. This book is written in Latin and has no full translation in any modern language. The third part of the book, '*De Acupunctura*' (On Acupuncture) has been translated by Robert W. Carrubba and John Z. Bowers.[14] I will refer to their translations, but the quotations in this thesis are all translated by myself, for the sake of terminology consistency. Also, I am using ChatGPT 4 to assist with some translation, ChatGPT 4's translated text can be found in the footnotes along with the original Latin text.

The main sources for the discussions around *Dissertatio de Arthritide* are mostly digitalised books from the Early Modern Book Online platform.[15] Another important source is an anonymous book review of *Dissertatio de Arthritide* in *Philosophical Transactions*[16] Philosophical Transactions was launched in March 1665, and is now fully digitalised on its official website.[17] This particular book review has been published online on 1st January 1997.

[13] 'Details' in 'Dissertatio de Arthritide Mantissa Schematica de Acupunctura et Orationes / Wilhelmi Ten Rhyne.,' Early English Books Online, November 11, 2020, https://www.proquest.com/eebo/docview/2264211418/citation/130F79A97B794454PQ/1?accountid=14952&tocViewMode=tocViewModeSearchOther&sourcetype=Books.

[14] Robert W. Carrubba and John Z. Bowers, "The Western World's First Detailed Treatise on Acupuncture: Willem Ten Rhijne's De Acupunctura," *Journal of the History of Medicine and Allied Sciences* XXIX, no. 4 (1974): 371–98, https://doi.org/10.1093/jhmas/xxix.4.371.

[15] https://www.proquest.com/index

[16] "An Account of a Book, Viz. Wilhelmi Ten Ryhn M:D: &c. Transisalano Daventriensis, 1. Dissertatio de ARTHRITIDE. 2. Mantissa Schematica: 3. de ACUPUNCTURA. 4. Orationes Tres.Sc. De Chymiæ & Botanicæ Antiquitate & Dignitate. De Physiognomia. De Monstris.," *Philosophical Transactions* 43, no. 148 (June 10, 1683): 222–35, https://doi.org/10.1098/rstl.1683.0032.

[17] https://royalsocietypublishing.org/loi/rstl

Most literature mentioned in the 'literature review' serves as secondary sources for this thesis, especially the fourth group, which has already explored many variations in the circulation of acupuncture knowledge.

This thesis, which also studies the variation of medical knowledge during circulation, benefits greatly from their works. However, I will not follow their academic concerns to reconsider regional importance but will locate the circulation of acupuncture in the newly emerged field: History of Knowledge. The history of knowledge started as a marginalised field dealing with exotic or even eccentric topics, sometimes related to mainstream scholarship from colonial and postcolonial perspectives.[18] [19] In 2011, Philipp Sarasin (1956-) argued that knowledge should be considered as circulating "without hierarchies between different societal spheres and institutions, through media, between scientists and the so-called public."[20] He maintains that most historians have an inappropriate intention to link their texts to "the whole"(Das Ganze), which made the political unification, a state or nation, the premise of epistemology.[21] However, the political factors are not decisive in the circulation of knowledge, because knowledge as semantic content has the power to transcend institutional, social, political or even geographical boundaries depending on circulation in its functioning.[22] Historians of knowledge should treat knowledge as a phenomenon without determining whether it is right or wrong, good or bad, useful or useless under certain criteria, and should think about the emergence of knowledge, their influence, environment, media, and forms.[23]

[18] Peter Burke, *What Is the History of Knowledge?* (Cambridge: Polity Press, 2020), 2-3.
[19] Representative works from the colonial and postcolonial perspectives are *Knowledge is Power* (R.D. Brown, 1989), *Fields of Knowledge* (F.K. Ringer, 1992), and *Colonialism and its Forms of Knowledge* (B.S. Cohn, 1996).
[20] Philipp Sarasin, "Was Ist Wissensgeschichte?," *Internationales Archiv Für Sozialgeschichte Der Deutschen Literatur (IASL)* 36, no. 1 (2011), https://doi.org/10.1515/iasl.2011.010, 159.
[21] Sarasin, Was Ist Wissensgeschichte, 161.
[22] Sarasin, Was Ist Wissensgeschichte, 162.
[23] Sarasin, Was Ist Wissensgeschichte, 165.

Lorraine Daston considers the history of knowledge as a possibility to reformulate the current problematic field of the history of science. Daston asserts that the history of science as a discipline was established as a response to dramatic transformational phenomena driven by Modernity with a belief that "science created the modern world and with it Western geopolitical dominance; anyone who wanted to understand how modernity came about and how to deal with its challenges must therefore understand the history of science".[24] As a consequence, the history of science, and the making of modernity are twinned, which not only determined this field the Eurocentric narrative, but also exclude "the botanical garden, the forge, the library, the ship, and the household hearth", which are parts of European history of science but did not undergo revolutionary changes and were not decisive in the making of Modernity.[25] With the new discipline of the history of knowledge, the overfocus on "modern" and "Western" will be reduced, and historians of science will feel more comfortable exploring any form of science and knowledge from anywhere in any period.[26]

Following the discipline of the history of knowledge, this thesis traces the circulation of acupuncture (and moxibustion) in the 17th and 18th centuries with a focus on its functions or potential functions in different contexts. Besides telling a story around *dissertation de arthritide,* this thesis will also contribute to the theory of the mechanism of knowledge circulation by presenting the subtle and detailed reasons why early modern Europeans accepted or rejected a foreign technique, and what adjustments were made along with acceptance.

[24] Lorraine Daston, "The History of Science and the History of Knowledge," *KNOW: A Journal on the Formation of Knowledge* 1, no. 1 (2017): 131–54, https://doi.org/10.1086/691678, 133.
[25] Daston, The History of Science and the History of Knowledge, 141-2.
[26] Daston, The History of Science and the History of Knowledge, 142.

Content and Structure

Two key points from *Dissertatio de Arthritide* are the primary focus of this thesis. One is the theoretical basis for the effectiveness of acupuncture described as "Flatus Causes Pain," and the other is the acupuncture procedure itself: treating diseases with needles. "Flatus Causes Pain" is a research conclusion of ten Rhijne's critical inheritance of Galen's legacy, and acupuncture happens to be the proof of this conclusion. By examining the relationship between "Flatus Causes Pain" and Galenic medicine, and in what sense it relates to acupuncture, this thesis demonstrates the complex relationship between acupuncture and European medical theory. The context of knowledge dissemination is limited to the intellectual community, rather than the broader social and cultural environment. The needle, the main tool in acupuncture, is also a symbol of precision surgery, aligning with the contemporary European outlook on fine surgical procedures. This outlook sustained European interest in acupuncture, even in the long absence of actual practice. By showcasing early modern Europeans' views on needles, this thesis describes a phenomenon: the acceptance or rejection of knowledge depends not on the conclusion but on whether the knowledge is included in the discourse.

This thesis has three chapters. The first chapter aims to provide the background about *Dissertatio de Arthritide* and the second about *flatus* the third about needles. With more details, Chapter 1 is about the publication of *Dissertatio de Arthritide* It asks what information ten Rhijne had access to, how many direct or indirect experiences with acupuncture he went through, and why he wrote and published this book. The focus of this chapter will be the story between ten Rhijne and Japan. By contextualising ten Rhijne in the social, political, economic, and academic context of Japan's Edo period (1603-1867), this chapter clarifies the sources of knowledge related to acupuncture that ten Rhijne used for the *Dissertatio de Arthritide* and how ten Rhijne processed them.

The following chapter deals with the content of this book, in which ten Rhijne integrates acupuncture with the legacy of Galenic medicine by claiming that *flatus* is the cause of every illness and acupuncture and moxibustion can cure it. Arthritis, however, only serves as an example of the effectiveness of acupuncture and moxibustion, which, with Galenic theory, shared a consistency in this work. This chapter argues that mainstream Galenic medicine in Europe still allowed considerable interpretive flexibility in individual writings, and acupuncture could fit into this space. In other words, acupuncture was not recognised as an East Asian medical practice alongside East Asian medical theories, but rather because of its compatibility with Galenic medicine.

The third and last chapter follows the reception of this book up to the end of the eighteenth century. These discussions led to a preference for acupuncture over moxibustion. Although Europeans at the time could not produce special needles for acupuncture, they more or less came to the agreement that acupuncture was a promising technique. On the other hand, moxibustion was dismissed by European medical elites. This chapter argues that the formation of the academic context is influenced by multiple factors and has a certain degree of openness. Whether a technique can be incorporated into the academic context depends on whether it meets academic expectations, rather than whether it has been proven correct.

CHAPTER 1 WILLEM TEN RHIJNE AND JAPAN

In his treatise *Dissertatio de Arthritide*, Willem ten Rhijne coined the word "*acupunctura*", which means "pricking with a needle" from Latin *acus* "a needle" and *punctura*, "to prick, pierce"[27]. Not surprisingly, one-third of this treatise, part III, is about needles, different kinds of needles, various uses of needles, etc., and here started the history of exploring needle-pricking surgery techniques in Europe. Through various historical details, this chapter will trace ten Rhijne's journey to Japan, explain why he wrote a book on acupuncture after this journey, and explain the information he may have gathered.

Given the complexity of European and Japanese societies and medical fields, understanding the details of ten Rhijne's journey to Japan is crucial for comprehending the spread of acupuncture in Europe. First, both Europe and Japan had various types of medical practitioners, each with different education, social status, and medical practices. Simply providing a general overview of the medical fields in Europe and Japan cannot adequately explain the specific context of acupuncture's transmission in Europe. Only by detailing ten Rhijne's journey to Japan can this thesis provide a precise background for the book *Dissertatio de Arthritide*. Secondly, the modes of knowledge dissemination in Europe and Japan were different. Ten Rhijne and his peers belonged to the Republic of Letters, a geographically global intellectual community of mostly European men from the 17th to 18th centuries. They exchanged information through letters, published papers, books, and accounts. In contrast, knowledge in contemporary Japan was controlled by hereditary families and rarely published openly. This asymmetry in information

[27] Harper Douglas, "Etymology of acupuncture," *Online Etymology Dictionary*, accessed October 17, 2023, https://www.etymonline.com/word/acupuncture.

dissemination highlights the limited understanding Europeans had of acupuncture and explains why acupuncture became a topic of discussion among Europeans.

Most of the information in this chapter comes from secondary literature, primarily the research of Harold J. Cook and Michel. They have conducted detailed studies on ten Rhijne's journey to Japan. Interestingly, their narratives differ significantly. Cook views ten Rhijne's journey to Japan as an exchange of knowledge and culture,[28] while Michel focuses on the spread of acupuncture to Europe.[29] Due to their differing narrative angles, some of their accounts seem contradictory. For instance, Cook believes ten Rhijne went to Japan to teach advanced Western medical techniques, whereas Michel argues that ten Rhijne was sent to Japan by the VOC for official duties. To address such contradictions, I adopt a descriptive strategy, focusing on detailing the time, place, and events, while minimising commentary on the emotions of the people involved and the significance of the events.

A Mission about Pharmaceutical Oil

Ten Rhijne spent two years in Japan, from 30th July 1674 to 27th October 1676, as the instructor for pharmaceutical oil production.[30] Some literature states that ten Rhijne was sent to Japan to provide surgical help, or to teach advanced Western medical knowledge to Japanese people, which is also right.[31] This is because in Edo Japan (1603-1868) producing pharmaceutical oil was the most important part of surgery.

The opportunity for the Japanese to understand European medicine was not rare from 1549, the arrival of Jesuit missionaries. However, the “advanced Western medicine” of Andreas Vesalius

[28] Harold John Cook, *Matters of Exchange: Commerce, Medicine, and Science in the Dutch Golden Age* (New Haven, CT: Yale University Press, 2008), 351

[29] Michel, “１６〜１８世紀のヨーロッパへ伝わった日本の鍼灸 [Japanese Acupunture and Moxibustion in 16-18th Century Europe].

[30] Cook, *Matters of Exchange*, 361.

[31] Cook, *Matters of Exchange*, 361.

(1514-1564), Gabriele Falloppio (1523-1562), Girolamo Fabrizio (1533-1619), Adriaan van den Spiegel (1578-1625) and many anatomical pioneers' discoveries was not updated to the Japanese. On the one hand, missionaries needed more effective medical treatment to convert the Japanese to Christianity. Leprosy was the main target: although the treatments were rudimentary and the efficacy was doubtful, caring for patients' feelings and freeing them from isolation earned the gratefulness from the Japanese people followed by the reputation of Western people.[32] On the other hand, since European languages were not familiar to Japanese, the necessary translation from European medical terms to Japanese created many mistakes and rendered European medicine into the system of *kampo igaku* (Chinese medicine), which was dominant at the time.[33]

The Portuguese were the first Europeans to arrive in Japan, but they were driven out under the order of Shogun Tokugawa because they brought with them a militant form of Catholicism.[34] The Dutch, under restriction, maintained their connection with Japan not only because they promised to limit their activities to trade, but also because they came from a place that favoured Protestantism over Catholicism.[35] In 1609, a trading post was built at Hirado in western Japan, and it was moved to *Dejima* in 1641[36]. *Dejima* means "Exit island" in Japanese. An artificial canal was dug to isolate *Dejima* from the main island of *Nagasaki*, and the only link was a small

[32] Ranzaburo Otori, "The Acceptance of Western Medicine in Japan," *Monumenta Nipponica* 19, no. 3/4 (1964): 254, https://doi.org/10.2307/2383172, 256-7.
[33] Jayant S Joshi and Rajesh Kumar, "The Dutch Physicians at Dejima or Deshima and the Rise of Western Medicine in Japan," *Proceedings of the Indian History Congress* 63 (2002): 1062–72, 1067-8.
[34] Thomas M. van Gulik and Yuji Nimura, "Dutch Surgery in Japan," *World Journal of Surgery* 29, no. 1 (2004): 10–17, https://doi.org/10.1007/s00268-004-7549-3, 10.
[35] Thomas M. van Gulik and Yuji Nimura, "Dutch Surgery in Japan," *World Journal of Surgery* 29, no. 1 (2004): 10–17, https://doi.org/10.1007/s00268-004-7549-3, 10.
[36] Wolfgang Michel, "Medicine and Allied Sciences in the Cultural Exchange Between Japan and Europe in the 17th Century," essay, in *Theories and Methods in Japanese Studies: Current State & Future Developments: Papers in Honor of Josef Kreiner*, ed. Hans Dieter Ölschleger (Göttingen: Bonn Univeristy Press, 2007), 285–302, 287-288.

bridge. For more than 200 years, *Dejima* was the only place in Japan that was open to the outside, primarily for trade.

Limiting the connection with the Dutch to trade, Japan's window for perceiving European medicine was consequently restricted to ship surgeons. Ship surgeons were licensed by guilds and needed only one year of apprenticeship to be qualified.[37] These ship surgeons provided medical services to the crews of merchant ships and were occasionally stationed at treaty ports. The first and most influential ship surgeon for the Dutch was Caspar Schamberger (1623-1706), who joined the VOC. He was required by Commissioner Inoue, the commissioner for the VOC in Nagasaki, to stay for an extra six months to provide surgical help. After him, the trend of Komo-ryu geka (redhead-style surgery)[38] emerged in Japan. Japan actively sought advice from European barber-surgeons on how to deal with fractures, bruises, swelling, skin abscesses, and other problems and invited licensed barber-surgeons to come to Japan to train surgical apprentices. At the same time, more complicated surgeries such as lithotomy and amputation did not catch the eye of the Japanese.[39]

For simple surgeons, applying pharmaceutical oils appeared to be more important, and were required techniques for the production of pharmaceutical oils. Before the devoted help of Schamberger, Japanese distillation equipment was a device called Ranbiki. Historians cannot agree on whether the Portuguese or the Dutch were the first to bring it to Japan, but it was the Dutch who made it important and made the Japanese dependent on pharmaceutical oil. A Ranbiki is a three-layer steamer, the bottom layer contains water, oil, or other mixed liquids, and the second layer can optionally contain some herbs. The liquid at the bottom is heated and vaporised and rising. When it reaches the top layer, it cools and condenses into liquid and flows

[37] Gulik & Kumar, Dutch Surgery in Japan, 13.
[38] Because Dutch people have red hair
[39] Wolfgang Michel and Elke Werger-Klein, "Drop by Drop: The Introduction of Western Distillation Techniques into Seventeenth-Century Japan," *Journal of the Japan Society of Medical History* 50, no. 3 (2004): 463–92

out from the side tube. If herbs are placed in the second layer, the hot gas can extract the main components of the herbs.[40] Although the Ranbiki is not a very complex device, using it to make high-quality pharmaceutical oils still requires sufficient knowledge of chemistry. Some pharmaceutical oils do not require distillation but do require chemical processing to complete.

The Japanese needed help from the Dutch in chemical technology, which were skills attributed to physicians in the eyes of the Japanese at the time. In the beginning, the Dutch were unwilling to offer any help. This reluctance applied not only to the technology but also to the required plants ordered by the Japanese. This was due to the East India Company's attempt to gain a monopoly on the global spice trade. In 1667, they even destroyed clove trees on a large scale in the Moluccas (now in northeastern Indonesia); [41] while the order placed by Japan not only included plants, but also requested seeds and saplings of clove, nutmeg, cinnamon, and more. The Dutch's delay and refusal were quickly noticed by the Japanese. In 1670, while making another order request, the Japanese side expressed its dissatisfaction seriously, by saying "At least it would show that the Dutch respect the emperor's order." [42] The VOC accepted the Japanese proposal this time and also agreed to send a physician who had a good understanding of plants. In 1671, Franz Braun, a German pharmacist (not a physician), arrived at Dejima with plants and devices. He built a production hut in Dejima, and in 1672, this hut was able to produce pharmaceutical oil from aniseed, camphor, clove, fennel, juniper berry, and rosemary.[43] In the 1670s, oil produced at Dejima was an annual tribute gift to the shogun. It was not until 1682, when the East India Company regained its monopoly on pharmaceutical oil,

[40] Michel and Werger-Klein, "Drop by Drop" 489-90.
[41] Michel, "Medicine and Allied Sciences," 293.
[42] NA, NFJ 82, dagregister, 29.8.1670; letter by de Haas, 19. 10. 1670. Cite from Michel, "Medicine and Allied Sciences," 292.
[43] Michel, "Medicine and Allied Sciences," 294.

that Dejima was unable to obtain the plants for producing it and could only import bottled oils from Batavia. [44]

After Braun, another medical expert was assigned to Dejima to guide the production of pharmaceutical oils: ten Rhijne. Since the hut was established and the procedure was fixed, it was not a hard job and ten Rhijne was overqualified considering the average of his competitors for the position in Dejima. Only two among five candidates obtained medical doctorates: ten Rhijne and Adriaan van der Poel. Van der Poel was born around 1642, lived and practised in the Hague, matriculated on 21st April, 1667 at Leiden, and defended his dissertation on 2nd May 1667 on the topic of angina.[45] No further information can be found about him. In contrast, ten Rhijne was a young promising physician before his departure to Japan. He was born in 1649 in Deventer, and received education at various places: Deventer, Franeker and Leiden. His thesis was supervised by Franciscus Sylvius (1614-1672), a famous Dutch physician, chemist, physiologist, and anatomist, who was also one of the earliest champions of Harvey's theory of the circulation of the blood in the Dutch Republic. When ten Rhijne obtained his doctorate, he had already made friends with many talented physicians and botanists of the time, including Jan Swammerdam (1637-1680) and Frederick Ruysch (1638-1731). [46]

Although many botanists at the time wanted the chance to go to Asia to learn about the plants, ten Rhijne did not apply for Dejima with the same motivation. Although he had abundant botanical knowledge and later wrote several books on plants later, the position at the Dejima trading post was far from ideal for botanical research: his activities would be restricted and monitored. The only reason for this young medical talent to leave his hometown for Japan was

[44] Michel, "Medicine and Allied Sciences," 296.
[45] Cook, *Matters of Exchange*, 349.
[46] Cook, *Matters of Exchange*, 349-350.

the Anglo-Dutch War, which started on 27 March 1672.[47] This war not only caused the Dutch Republic to lose a large amount of territory but also severely damaged the Dutch navy and affected the Dutch's leading position in global trade. The year 1672 was a turning point in the Dutch Golden Age, and going to the colonies was the life choice of many Dutch intellectuals. Ten Rhijne received his appointment on 6th February 1673, and departed for Batavia in June.

The Curiosity for Acupuncture

In January 1674, ten Rhijne arrived at Batavia, where he met a Reformed pastor of Batavia, Hermann Busschof, whose gout was miraculously cured by moxibustion and advised ten Rhijne to pay more attention to this technique when he went to Japan.[48] Busschof was cured by a Chinese woman (referred to in the sources as Indian) from southwestern China. Busschof then recorded this treatment in his book on gout, explaining how this woman burned about twenty spots around his feet and knees, which neither blistered nor caused after-pain, and afterwards the gout vanished.[49] It is unclear whether Busschof was the first to coin the word moxibustion, but he was one of the first users of this word. Moxibustion is the combination of Moxa, mugwort, and Combustible, burning, and moxibustion refers to the therapy that burns the mugwort.

[47] Cook writes a story about how ten Rhijne expected to serve the shogun when he got the position and was disappointed because he has been made so little use of (359-361). Although Cook's work is always based on solid materials, I still question his assumption but think both ten Rhijne and the VOC know what this position is for. Since the concerns about pharmaceutical oils were always the battlefield between the Japanese government and VOC, and the hut had already been built, and VOC even trained ten Rhijne to blow the glass, which was obviously for the distillation, what this position was for should be very clear before the departure of ten Rhijne. Beside, at the time ten Rhijne came, the Japanese had already shown their interest in European Medicine and invited many barber-surgeons to Dejima to teach the local Japanese people, and those Barber-surgeons were treated like prisoners.

[48] Cook, *Matters of Exchange*, 350-351.

[49] Hermann Busschoff, Hendrick Roonhuyse, William Standfast, *Two treatises, the one medical, of the gout, and its nature more narrowly search'd into than hitherto; together with a new way of discharging the same / By Herman Busschof Senior, of Utrecht, Residing at Batavia in the East-Indies, in the service of the Dutch East-India Company. The other partly chirurgical, partly medical; containing some observations and practices relating both to some extraordinary cases of women in travel; and to some other uncommon cases of diseases in both sexes. By Henry van Roonhuyse, Physician in Ordinary at Amsterdam, Englished out of Dutch. By a careful hand.*, (London: Printed by H.C. and are to be sold by Moses Pitt, 1676.), A1-A2.

Although both acupuncture and moxibustion have accurate correspondences in Chinese: 鍼術 (zhēn shù), the technique of needles; and 灸術 (jiǔ shù), the technique of burning, in the Chinese context it is customary to use their synthesis, 鍼灸 (zhēn jiǔ), which means needle and burn. 鍼灸 is a technique that stimulates the body at certain points with needles or fire. For most points, needling or burning is interchangeable, and the choice of needle or fire depends highly on convenience and the preferences of practitioners. In seventeenth-century Japan, medical terms were similar to Chinese medical terms: 鍼術 (しんじゅつ), 灸術(きゅうじゅつ), and 鍼灸 (しんきゅう) in Edo times, or 鍼 (はり) and 灸 (きゅう) in modern Japanese. Modern translators translate 针灸 (zhēn jiǔ) simply as acupuncture, omitting the connotation of burning. However, in seventeenth-century Batavia, both Busschof and ten Rhijne should have known at least that moxibustion and acupuncture are closely related. This explains why Busschof told ten Rhijne about his experience with moxibustion but ten Rhijne wrote back a book about acupuncture.

Besides the lexical differences, the connotation difference between Sino-Japanese acupuncture and what Busschof and ten Rhijne perceived were highly significant. For the Chinese and Japanese, acupuncture and moxibustion are based on a system of points to be needled or burned. What matters is not the action of needling or burning, but recognising the points. There are two kinds of points: meridian points and Ashi points (阿是穴 in Chinese, あし点 in Japanese). meridian points are on the meridians of the body. There are main meridians, connecting or *lo* meridians, muscle meridians, and extra meridians, and each meridian has some points that correspond with certain muscles or organs.[50] Ashi points do not follow any meridians, but are the most tender spots. Ashi points are only for patients who suffer from severe pain. The

[50] Macdonald, *Acupuncture from Ancient Art to Modern Medicine*, 33-53.

practitioner would press the painful area, and find the most painful points. When the doctor's finger reaches this point, the patient screams out "Oh, yes", which is pronounced "A-Shi" in Chinese. Needling or burning the points can relieve the pain.[51]

Since the curiosity towards acupuncture of Busschof and ten Rhijne was about relieving the severe pain of gout, they would have been particularly interested in the practice around Ashi points, which require no knowledge of the meridian system. Ten Rhijne's book on acupuncture, the content of which will be discussed in Chapter 2 of this thesis, although includes graphs of meridian points, does not explain how these graphs are useful for curing gout. All descriptions of acupuncture practice in the book focus on the practice with Ashi points. Elisabeth Hsu pointed out that the history of Acupuncture in Europe can be divided into two parts, one is only about needle-pricking, and the other is about the needle-pricking and the theory behind it.[52] This thesis focuses only on the needle-pricking part because the other part consists of translated works that were not influential at the time.

Gathering Materials in Japan

Rhijne was appointed as the new head of the pharmaceutical factory on 20th June 1674 and arrived in Dejima on 30th July.[53] However, his exploration of moxibustion and acupuncture could not start immediately. The most important reason, surprisingly, was not that he could not read Japanese or Chinese, but the mechanism of medical knowledge circulation in Japan.

On the one hand, Japan had not centralised medical education and services with institutions. Chinese medicine became popular in Japan mostly via Buddhist missionaries from the 6th century. Unlike Christianity, Buddhism was welcomed in Japan and promoted interaction

[51] Macdonald, *Acupuncture from Ancient Art to Modern Medicine*, 137.
[52] Hsu, "Outline of the History of Acupuncture in Europe," 28.
[53] Cook, *Matters of Exchange*, 351.

between China and Japan in many aspects. Since 607, the Japanese government had been sending students to China to acquire practical wisdom in politics, architecture, and medicine.[54] However, when hundreds of students returned to Japan, they could not be registered in any official institutions. On the one hand, Japan did not establish an institution despite sending students. On the other hand, Japanese medical learners were Buddhists, who more or less held values of individualism and were not necessarily attached to an institution. Until the Edo period, there were still many influential practitioners identified as Buddhists who lived a semi-cloistered life.[55] It was not easy for ten Rhijne to find them.

On the other hand, during the Edo era, although the printing market was prosperous, what was published were mainly news, illicit materials, and books of local interests.[56] The Japanese had the habit of writing down their wisdom or practical skills, not for publishing, but for their descendants.[57] In some families or lineages, several generations were engaged in the same profession, such as trade, architecture and medicine. Their family often had large collections of professional books and manuscripts, including works written by family members and carefully purchased during their careers. These collections might include printed books, scribal copies, or manuscripts, and the collections themselves and the knowledge contained in them were regarded by the family as their private property. Every lineage with a rich collection had a strict system to manage the accessibility of the items. Some items could not be opened to women, juniors, or heirs with insufficient experience. These linages needed to keep their written knowledge secret and thus remain competitive among peers. For example, most Chinese

[54] Kenny Kuchta, "Traditional Japanese Kampo Medicine – History of Ideas and Practice; Part 1: From Ancient Shamanic Practice to the Medical Academies of Edo," *Traditional & Kampo Medicine* 6, no. 2 (2019): 49–56, https://doi.org/10.1002/tkm2.1209, 2.
[55] Kuchta, "Traditional Japanese Kampo Medicine", 2.
[56] Peter F. Kornicki, "Manuscript, Not Print: Scribal Culture in the Edo Period," *The Journal of Japanese Studies* 32, no. 1 (Winter 2006): 23–52, https://doi.org/10.1353/jjs.2006.0016, 33.
[57] Kornicki, "Manuscript, Not Print", 33.

medicine books were restricted to the Irie lineage.[58] Since ten Rhijne neither married into a Japanese medical family nor worked as a personal medical consultant for a nobleman with a well-stocked library, it was impossible for him to have access to any core Japanese or Chinese medical manuscripts or printed materials, making it impossible for him to understand the key aspects of acupuncture or moxibustion.

Fortunately, ten Rhijne was able to learn about acupuncture and moxibustion from Iwanage Sokka and Motogi Shodayu. Motogi Shodayu was an interpreter and helped ten Rhijne a lot with his limited knowledge of Dutch. Iwanage Sokka was also an interpreter, but with a better knowledge of Dutch. Sokka was an apprentice under the Japanese doctor Makai Gensho.[59] Both Sokka and Shodayu visited ten Rhijne under the order of the Nagasaki Bugyo. Their task was to present various medical questions to ten Rhijne, explain them to him, and then record the answers given by ten Rhijne and return them to the questioner. The workload of ten Rhijne was now small. Each round of interpretation, translation, and finalising of answers could take weeks or even longer. In a text published in Japan in 1680, more than 150 questions and answers between ten Rhijne and his interpreters were made public, most of which were asking for the specific solution to certain skin swellings, but there was also discussion about the pulse-taking habits of the Dutch and they different from the pulse-taking in China and Japan.[60]

From ten Rhijne's arrival in Dejima to his visit to the Shogun in Edo, the intensive discussions between him and his interpreters did not stop. Because of the competent performance in answering questions, ten Rhijne received considerable courtesy and was able to go to Edo as a member of the annual meeting between VOC representatives and the central government.

[58] Wei Yu Tan, "Rediscovering Willem Ten Rhijne's De Acupunctura: The Transformation of Chinese Acupuncture in Japan," *Translation at Work*, 2020, 108–33, https://doi.org/10.1163/9789004387737_005, 112-3.
[59] R. W. Carrubba and J. Z. Bowers, "The Western World's First Detailed Treatise on Acupuncture: Willem ten Rhijne's De Acupunctura," *Plastic and Reconstructive Surgery* 55, no. 6 (1975): 727, https://doi.org/10.1097/00006534-197506000-00079, 372.
[60] Carrubba and Bowers, "The Western World's First Detailed Treatise on Acupuncture", 372.

However, this was not an entertaining journey. Instead, ten Rhijne faced many challenges regarding the workload and the tasks. On the first day of his arrival, 15th March 1675, he was visited by Genpo, a former interpreter and now the physician in Bakufu, the military government. Genpo first reviewed with ten Rhijne all the records of questions he had answered in Dejima, and then told him that he needed to go to the court and give some medical advice to the people there. In the days that followed, ten Rhijne continued to receive visitors, answering various questions, some about disease treatments, some about plant names, and some confirming questions he had answered before.[61]

Based on what happened after ten Rhijne returned to Dejima, it is difficult to say that his trip to Edo was a success. Then, ten Rhijne left Edo on the 6th of April and returned to Dejima on the 14th of May, no interpreter formally asked him questions anymore. Perhaps the Japanese thought they had asked all the questions they needed to ask and did not need to communicate further, but it is more likely that ten Rhijne's replies in Edo did not meet the expectations of the court.[62] The main reason for this may be that ten Rhijne could not cure breast cancer. There is no information on which woman needed to be consulted on this issue, but she must have been important. Doctor Genpo and Governor Caesaer approached ten Rhijne many times to discuss this issue, but ten Rhijne had no other choice but to explain the cause of the disease according to his understanding. Clearly, breast cancer cannot be solved with botanical knowledge and pharmaceutical oils.

Ten Rhijne's subsequent work returned to pharmaceutical oil production, where he was always asked about distillation and his management of the hut. In the spring and summer of 1676, he went to Edo for the second time. The issues discussed were still mainly about pharmaceutical oils and, of course, his position and work content. However, there were still high-ranked

[61] Cook, *Matters of Exchange*, 356-358.
[62] Cook, *Matters of Exchange*, 358.

Japanese physicians who visited ten Rhijne and privately asked questions about Dutch medicine. Ten Rhijne seems to have formed a good friendship with these physicians, as he often received presents from them. [63]

The Possible Sources of Dissertatio de Arthritide

It is highly possible that ten Rhijne obtained some materials and understanding about moxibustion and acupuncture during these exchanges. Unfortunately, no one can know exactly what he had seen, because detailed information about moxibustion and acupuncture was often the secret of major medical lineages, and it could only reach ten Rhijne through secret means, which was aimed at avoiding leaving any clues. However, because the medical lineages kept secrets from each other and developed independently, they usually had different understandings and practices. By comparing ten Rhijne's works with various medicines of different lineages, the medical information that ten Rhijne obtained can be roughly inferred.

A striking clue is the four illustrations in ten Rhijne's book. He specifically explained that two of them were Chinese acupoint maps and two were Japanese acupoint maps. This shows that the materials he encountered differentiated between Chinese and Japanese acupuncture. Judging from ten Rhijne's description, he believed that the Chinese preferred acupuncture while the Japanese preferred moxibustion. Therefore, the Chinese acupuncture maps not only have conduits but also specific acupoints; while the Japanese maps only have conduits, and moxibustion can be performed anywhere along the conduits, not necessarily at any specific points.[64]

[63] Cook, *Matters of Exchange,* 361.
[64] Rhijne, Willem ten, 1647-1700. *Dissertatio De Arthritide Mantissa Schematica De Acupunctura Et Orationes / Wilhelmi Ten Rhyne*. London: 1683. https://www.proquest.com/books/dissertatio-de-arthritide-mantissa-schematica/docview/2264211418/se-2.

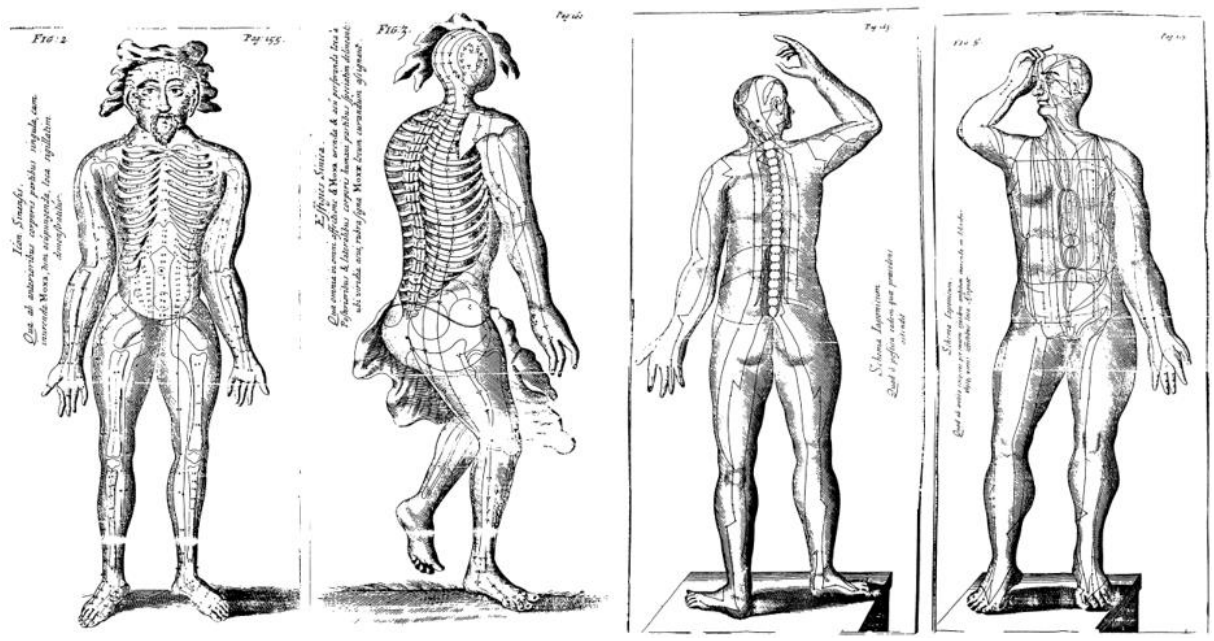


Figure 1 the Acupuncture diagram in ten Rhijne's book
(From left to right: Chinese illustration front, Chinese illustration back, Japanese illustration front, Japanese illustration back.)

The idea that moxa can burn anywhere along the conduits is not common. From ancient times to the present, moxibustion practitioners in China, Japan and Korea have mostly tended to burn moxa sticks at specific points. The only person who might have performed this kind of moxibustion was Goto Genzen (1659-1733). He was one of the most influential medical elites in the Edo period and was the originator of Kohoha (古方派, ancient method) in Kampo medicine (Chinese-origin Japanese Medicine). Genzen admired the 伤寒论 (*Treatise on Febrile Diseases*) written by Zhang Zhongjing, a Chinese physician from the Han Dynasty, and rejected complicated medical theories. He believed that the cause of all diseases was only cold air and treated diseases with bear bile, moxibustion and hot springs to drive away the cold air from the patient's body. Genzen had no works handed down, but he had many disciples. Moreover, because he resisted shaving and did not wear monk robes or cassocks but wore

ordinary clothes, many doctors followed his example, which separated Japanese medicine from Buddhism.[65]

Ten Rhijne's impression that Japanese moxibustion does not need to strictly follow the points is likely to have come from Japanese doctors' discussions about Genzen. Additionally, ten Rhijne combined Hippocratic medicine with the idea that the cause of all diseases is Flatus (air), which must be based on Genzen's theory.[66] Because Chinese Medicine has always been dominated by numerous balance, containment, and transformation theories, single-cause theories are rare. Therefore, it is highly unlikely that ten Rhijne's understanding of pathogeny in the theory of acupuncture and moxibustion came from elsewhere.

Another obvious clue is the small hammer mentioned by ten Rhijne in his description of the acupuncture procedure. Ten Rhijne pointed out that the needle must penetrate to a specific depth at a specific point to be effective, sometimes deep into the bones.[67] Therefore, the needle must be long, sharp and round and it enters the body by rotation or with a little hammer.

[65] Terutane YAMADA, "The Tradition and Genealogy of the Kampo Medicine," *Kampo Medicine* 46, no. 4 (1996): 505–18, https://doi.org/10.3937/kampomed.46.505, 510.
[66] Ten Rhijne. *Dissertatio De Arthritide, Part 1.*
[67] Ten Rhijne. *Dissertatio De Arthritide,* 183-184.

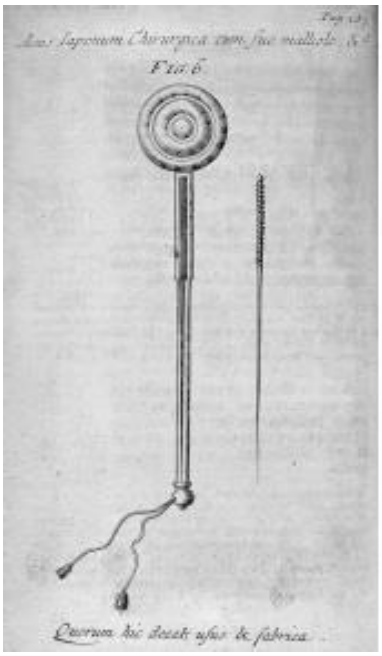


Figure 2 Japanese acupuncture needle and hammer from Willem ten Rhijne's book

Ten Rhijne's understanding of the need for needles to reach a certain depth is consistent with the experience of most acupuncture practitioners. However, his description of the method of inserting the needle is not universal. In China, acupuncturists prefer to insert needles directly into patients' skin, believing that the faster the insertion, the less pain it would cause. Thus, acupuncturists are required to practice their wrist strength to achieve rapid insertion. Acupuncturists also need to learn to control the movement and strength of their wrists so that the needles can penetrate to the correct depth in one prick. Rotating the needle is considered beginner or unprofessional behaviour in the Chinese context. Japan did not discriminate against the operation of rotating the needle, and hammering the needle was not adopted by every Japanese practitioner. Wei Yu Wayne Tan has specifically researched the relationship between Willem ten Rhijne and Mubun lineage.[68] The name of the hammering technique is Shindo, which means "hammering the needle".[69] Compared to a needle, a hammer is easier to hold.

[68] Wei Yu Wayne Tan, "Rediscovering Willem Ten Rhijne's De Acupunctura: The Transformation of Chinese Acupuncture in Japan," essay, in *Translation at Work: Chinese Medicine in the First Global Age* (Leiden: Brill Rodopi, 2020), 108–33.
[69] Tan, "Rediscovering Willem te Rhijne", 122.

With the help of a hammer, it is easier for the acupuncturist to find where to place the needle. Each time you hammer, the needle will go inward a little. By hammering a few times, acupuncturists can reach the desired depth incrementally.[70]

However, no writing from Mubun lineage has been kept until now.[71] Tan also did not indicate through which materials ten Rhijne could know about the hammer technique. However, Tan made a conjecture about the possible materials ten Rhijne might have accessed through other clues: the information about Chinese medicine. Tan suggested that ten Rhijne may have been exposed to Chinese acupuncture materials through the Irie lineage, because the Irie lineage had been active in medical exchanges between Japan and China since the sixteenth century.[72] I agree with his conjecture for another reason: Irie lineage recorded the hammer method from the 1640s to the 1650s.[73]

Publish *Dissertatio de Arthritide*

What is certain is that ten Rhijne did not obtain much material about Chinese and Japanese acupuncture and moxibustion from the VOC. He returned to Batavia on the 13th of December 1676 and was installed as a deacon of a church in January of the following year, serving until May 1679.[74] During his tenure, ten Rhijne held many important assistant roles concurrently. He assisted Hendrik van Rheede (1636-1691) in his botanical research at Dutch Malabar and was instrumental in the publication of *Hortus Malabaricus*.[75] For his contribution, the VOC

[70] Tan, "Rediscovering Willem te Rhijne", 125-126.
[71] Makoto Arai et al., eds., *Textbook of Traditional Japanese Medicine. Part 2: Acupuncture and Moxibustion* (Health and Labour Sciences Research Grant, 2010), 11.
[72] Tan, "Rediscovering Willem te Rhijne", 112.
[73] Arai, *Textbook of Traditional Japanese Medicine.* 12.
[74] Cook, *Matters of Exchange,* 361.
[75] Cook, *Matters of Exchange,* 362.

decided to let ten Rhijne assist Andreas Cleyer (1634-1697) in his research on Asian plants and Asian medicine. [76]

Cleyer was a German physician and botanist with considerable influence on plant management within the VOC. He was in charge of the internal supply of medicinal plants of the VOC and had a medical garden and two pharmacies in Batavia.[77] Almost all the material about China would be sent to Cleyer before publication. However, Cleyer's requests to know more about the Japanese plants always received absolute rejections from Japanese government. [78] Considering ten Rhijne's experience in Dejima, the two might have been good colleagues.

Cleyer and ten Rhijne shared the goal of publishing a book called *Specimen Medicinae Sinicae*. In addition to organising the materials, ten Rhijne was also responsible for polishing the Latin. However, ten Rhijne believed that Cleyer deliberately distanced himself from the Chinese manuscript on pulse diagnosis and did not accept his opinion on those manuscripts.[79] As the manuscript of the book was being sent to Europe for publication, ten Rhijne and Cleyer parted ways. Because Cleyer's Latin was so poor, *Specimen Medicinae Sinicae* was not published until 1682, with the help of Sebastian Scheffer.[80]

After ten Rhijne parted ways with Cleyer, he quickly devoted himself to writing and publishing a book on acupuncture. He first sent some manuscripts to his friend Ruysch in the Netherlands and then wrote to the Secretary of the Royal Society, Henry Oldenburg, to discuss the publication.[81] The book received widespread attention in European society even before its publication. In 1683, *Dissertatio de Arthritide; Mantissa Schematica; De Acupunctura; et*

[76] Cook, *Matters of Exchange,* 362.
[77] Michel, "Medicine and Allied Sciences," 296.
[78] Michel, "Medicine and Allied Sciences," 297.
[79] Cook, *Matters of Exchange, 368.*
[80] Cook, *Matters of Exchange, 366.*
[81] Cook, *Matters of Exchange, 371*

Orationes Tres: I. De Chymiae et Botanicae Antiquitate et Dignitate, II. De Physionomia, III. De Monstris, was published simultaneously in London, The Hague, and Leipzig..

CHAPTER 2: ACUPUNCTURE AND EUROPEAN MEDICINE

Dissertatio de Arthritide is the first European book addressing acupuncture, and this chapter, the most important chapter of this thesis, is about the content of this book. Through a detailed analysis of ten Rhijne's descriptions and arguments, a better understanding of Hsu's claim will argue that the history of acupuncture in Europe should be divided into two parts: practice and theory.[82] Ten Rhijne's introduction of acupuncture is responsible for the acupuncture practice in Europe, not because he only includes the technical details of the technique, but because he tries to use theories of Galenic medicine (instead of a Chinese or Japanese medical theory) to support it. Although ten Rhijne is a marginalised figure in the historiography, and the subject of his writing is acupuncture, an Eastern concept in every sense, his awareness of the question is in accord with the concern of academic medicine at the time.

Although the previous chapter provides a complex background regarding the differences between West and East, and the difficulties of interaction between the two, this chapter will argue for a global perspective that includes both Eastern and Western medicine without viewing acupuncture as an exotic technique isolated from the European world.

The main content of this chapter is a restatement of ten Rhijne's argument that integrates acupuncture with Galenic medicine. I will introduce the text of *Dissertatio de Arthritide* and expand on the relevant background of Galenic medicine to aid the reader's understanding. Before delving into the discussion, it is necessary to note that in early modern Europe, what was referred to as Galenic medicine was not a standardised, systematic medical theory but rather a complex legacy of Galen's medical theories and practices. In other words, ten Rhijne might gladly accept some parts of Galen's theories while opposing others. Regardless, how ten

[82] Hsu, "Outline of the History of Acupuncture in Europe," 28.

Rhijne viewed Galenic medicine is not the focus of this thesis or this chapter. The focus of this chapter is how ten Rhijne used concepts related to Galenic medicine to argue for the legitimacy of acupuncture techniques from East Asia.

The Structure of the Book

The full title of the *book Dissertatio de Arthritide; Mantissa Schematica; De Acupunctura; et Orationes Tres: I. De Chymiae et Botaniae Antiquitate et Dignitate, II De Physionomia, III. De Monstris*; indicates its structure as: a collection of six essays—*Dissertation on Arthritis; Schematic Appendix; On Acupuncture; and three speeches On the Antiquity and Dignity of Chemistry and Botany; On Physiognomy; On Monsters.* The first essay explains the understanding of arthritis under the framework of Galenic medicine with a special emphasis on the concept of Flatus (air). The second essay is very short. It mainly attaches a map of acupuncture points and gives a brief introduction. The third essay is also brief and provides a more theoretical introduction to acupuncture. The fourth, fifth, and sixth essays are three speeches about the understanding of truth from aspects of botany and chemistry, physiognomy and monsters (monsters in medical and philosophical contexts refer to abnormalities and natural wonders).

Previous scholars treat the six essays differently and most attention is attracted by the second and the third essays. Carrubba and Bowers, who provide the first detailed introduction of this book to the academic world, completely neglect the three speeches in the latter half and provide a translation of the second and third essays, without mentioning the first essay.[83] Michel further explains these two essays and compares the content with Japanese texts.[84] Most further research

[83] R. W. Carrubba and J. Z. Bowers, "The West-Ern World's First Detailed Treatise on Acupuncture," *Plastic and Reconstructive Surgery* 55, no. 6 (1975): 727, https://doi.org/10.1097/00006534-197506000-00079.
[84] Wolfgang Michel, "Willemten Rhijne Und Die Japanische Medizin(II)," *Dokufutsu Bungaku Kenkyu* 40 (August 1990): 57–103.

is also based on these two essays. The reason is obvious: these two essays focus on information from Japan and can serve as the main materials for exploring what is transmitted from the East to the West. Meanwhile, all the other essays are irrelevant to crucial information about acupuncture and lack research.

Ten Rhijne would not think that is fair; otherwise, he would have only written two brief essays instead of hundreds of pages for an entire book. First, ten Rhijne was not a layman messenger between Japan and Europe with a causal interest in acupuncture but a physician with a medical doctorate and research experience in pain-related issues. He obtained his doctorate degree with the thesis "De Dolore Intestionorum e Flatu" (On the Pain of the Intestines from Gas) in 1668, several years before his trip to Japan.[85] In this thesis, ten Rhijne established a solid argument for the relationship between flatus (air) and pain, and the first essay of *Dissertatio de Arthritide* restates the thesis with detail. He re-emphasises the importance of flatus in the essay on physiognomy. Second, most academic discussions around acupuncture in early modern Europe are not based on the technique itself but on the theoretical arguments from ten Rhijne. For both reasons, the value of the *Dissertatio de Arthritide* goes beyond carrying the information of acupuncture from Asia to Europe, it also tells a story about how acupuncture fit into the early modern European academic context. In this thesis, I will examine the whole book to place the information of acupuncture techniques in the context of the seventeenth-century European academy.

However, I would not distort the fact that this book is presented in two parts, each part with three essays and has its themes. Ten Rhijne wrote two dedicatory letters (*Epistolae Dedicatoriae*) to the sponsors before each part. Besides expressing ultimate praise and respect to the sponsors, he also introduces his motivation for writing. In the dedicatory letter of the first

[85] Wolfgang Michel, "Willemten Rhijne Und Die Japanische Medizin (I)," *Dokufutsu Bungaku Kenkyu* 39 (1989): 75–125, 75.

three essays, ten Rhijne emphasises the seriousness of this work. On the one hand, he talks about the hardships of the journey (he and his companions faced death threats from the ocean and diseases several times) and the unfriendliness of the Japanese government (which completely isolated him from normal society)[86]. With those difficulties, ten Rhijne emphasises his unmovable determination to contribute to the medical academy. On the other hand, he emphasises the truth of Galenic medicine and why acupuncture was the best example of Galen's humoral theory.[87] Ten Rhijne points out that although many doctors have learned humoural theory, they do not know how to apply it. When those doctors encounter problems, they can only perform surgery to remove the focus of infection instead of the original of the disease, thus can never fully cure the disease. However, acupuncture cures people with humoural theories and it works. So acupuncture was highly worth it for the aim of verifying Galenic medicine. The next part of this chapter explains ten Rhijne's argument in detail.

The dedicatory letter for the latter part, however, holds a totally different emotion. Ten Rhijne wrote the second dedicatory letter with gratefulness towards not only the sponsors but also life and the world. On the one hand, he compares the difficulties he met during the journey (almost the same difficulties as in the first letter) with the abundant life in Batavia,[88] and he also compares the endless war in his homeland with the hopeful arrangement of the VOC.[89] Under the comparison, he marks the virtues of exploring wonderlands and dedicates his journey to promoting virtues. On the other hand, he argues for the relationship between ancient dignity and the knowledge of chemistry, botany, and medicine.[90] Ten Rhijne mentions the phenomenon that some people have done many things against humanity but can still welcome him warmly

[86] Rhijne Willem ten, *Dissertatio de Arthritide; Mantissa Schematica; De Acupunctura; et Orationes Tres: I. De Chymiae et Botaniae Antiquitate et Dignitate, II De Physionomia, III. De Monstris* (London: impensis R. Chiswell societatis Regalis typographi ad insigne Rosæ Coronatæ in Cometerio D. Pauli, 1683). A3-A4
[87] Willem, *Dissertatio de Arthritide,* A8-A10
[88] Willem, *Dissertatio de Arthritide,* O3-O4
[89] Willem, *Dissertatio de Arthritide,* O3-O4
[90] Willem, *Dissertatio de Arthritide,* O4

with plants, fruits, and useful techniques, showing the brilliance of human nature.[91] He thinks the problem with those people is the lack of education, but with the knowledge of plants and medicine, they are rich in virtues. Thus, ten Rhijne wants to write about this knowledge and argue for its relationship with virtues. In the later writing, acupuncture serves as an example for the argument of virtuous knowledge. The third part of this chapter generalises ten Rhijne's understanding of virtues and paraphrases his description of acupuncture.

The Thesis of *Flatus* Causes Pain

For the first three essays, the central idea is that "Flatus (wind) causes the Pain", which is literally simple but extremely hard to understand for both modern people and ten Rhijne's colleagues. The sources of this idea, although the previous chapter speculates that it might be relevant to the Japanese doctor Goto Genzen, cannot by any means be the result of a temporary inspiration. A fact is, the relationship between flatus and pain is the doctoral thesis of ten Rhijne. That is to say, this is strictly academic work and targets medical professionals. Plus, given that ten Rhijne is a qualified scholar but not famous, his topic is somewhat niche and obscure, which creates more difficulties for readers. However, this thesis positioned acupuncture as a topic of significant interest in early modern European medical academies. This section will introduce this thesis in detail. A warning of obscurity could be put ahead, since pastor Busschof, who recommended moxibustion to ten Rhijne, could not understand it at all after listening to ten Rhijne's account in person.[92]

[91] Willem, *Dissertatio de Arthritide,* O5

[92] Busschoff has also published a book on moxibustion (*Two Treastise, the One Medical, of the Gout, and Its Nature More Narrowly Search'd into Than Hitherto; Together with a New Way of Discharging the Same*, 1676), and ten Rhijne in especially include an article in *Dissertatio de Arthritide* before all the essays to correct Busschoff's misunderstandings in his book.

The Definition of Flatus, Cause and Pain

To understand the thesis “Flatus Causes Pain”, one needs to acquire some fundamental knowledge around all three words, Flatus, Cause and Pain. Flatus could be the easiest among the three. It is a Latin word that means wind or blowing in modern English. The Greek equivalent of “flatus” is πνεῦμα (pneuma). In ancient Greek, πνεῦμα generally means "breath" or "spirit" and the Latin word “flatus” adopts the same connotation as pneuma, especially in the medical context. In Galenic medicine, pneuma plays a crucial role as part of a comprehensive system of physiology. There are three types of pneumas: (1) vital pneuma is generated in the heart from the air one breathes and mixed with blood to be distributed throughout the body via the arteries. It is essential for growth and metabolism. (2) natural pneuma is produced in the liver and associated with the venous system. It supports nutrition and reproduction. (3) psychic pneuma is a refined form of vital pneuma and is sourced from the brain. It works with nerves and is responsible for sensation and thought.[93] Besides the meaning of pneuma, flatus can also refer to pathological gases inside bodies, such as intestinal gas or flatulence. However, this explanation does not contradict the explanation of pneuma, because in the context of early modern times, pneuma was not an abstract metaphysical concept but rather a tangible presence that flowed within the body like gas. However, it seldom means wind or blowing in the as a medical term: “Flatus causes pain” does not mean that one feels pain because of the blowing of wind. Thus, this thesis keeps the Latin word flatus instead of wind to avoid potential misunderstandings.

[93] For more information regarding pneuma please consulting: R. J. Hankinson, *The Cambridge Companion to Galen* (Cambridge: Cambridge University Press, 2008), 242-262.

Since the form of Flatus is air, scholars might mistakenly interpret the concept of flatus in the system of humoral theory.[94] Humoral theory, also known as humorism, is a model of medicine that originated in ancient Greek medicine, most notably from Hippocrates, and was further developed and expanded by Galen and other physicians. It considers that the universe consists of four fundamental elements: earth, water, air and fire and each element is associated with two of four primary qualities: hot, cold, moist and dry. Earth is cold and dry; water is cold and moist; air is hot and moist; fire is hot and dry. These elements and their qualities manifest not only in the natural world but also within the human body through the four humours. Each humour corresponds to one of the four elements and inherits its qualities: (1) Blood is linked to air and embodies its warm and moist qualities. (2) Phlegm is associated with water and processes cold and moist qualities. (3) Yellow bile corresponds to fire and has a hot and dry nature. (4) Black bile is linked with earth and is cold and dry. Galenic medicine integrates humoural theories into medical practices, emphasising the importance of humour balance: an excess or deficiency in any of the humour could lead to disease.[95] To understand the thesis "flatus causes pain", the humoural theory is a necessity. However, flatus has nothing to do with air in the four elements. The Latin word for air is "aer" and is not interchangeable with "flatus". One should not understand "flatus causes pain" as "air causes pain" or "blood causes pain".

In summary, ten Rhijne's definition of flatus is based on the theory of pneuma in Galenic medicine, rather than the humoral theory. However, the humoral theory can play an explanatory role in the proposition "Flatus causes pain." That is, Flatus, similar to pneuma, is the primary cause of pain, while discussions related to the humoral theory are merely the conditions for

[94] The representative work is Shigehisa Kuriyama's *The Expressiveness of the Body and the Divergence of Greek and Chinese Medicine*, in which he makes an interesting comparison between the concept of qi in Eastern medicine and air as well as pneuma in western medicine.
[95] Lawrence I. Conrad, *The Western Medical Tradition: 800 B.C.-1800 A.D.* (Cambridge, Eng.: Cambridge University Press, 2011), 23-5.

pain. As for what constitutes a primary cause, this involves the definition of cause in the Galenic medicine that ten Rhijne inherited.

Compared to Flatus, the concept of "cause" is much more difficult. The Latin word for "cause" is "causa", broadly covering the concepts of cause or reason. However, to truly understand its meaning, clarifications should be made between "causa" and "causatio", and then between "causa/causatio" and "praecedens/initians". "Causa" (in Greek αιτία) is a fundamental concept in philosophy used to describe the underlying cause or explanations for events or states of beings, while "causatio" (in Greek αιτιον), although very similar to "causa", often used to refer more specifically to a singular cause or an immediate cause of an event. Both "causa" and "causatio" are primary causes, without which a certain thing cannot occur. On the contrary, "praecedens/initians" are qualifying cause, which promote the condition of certain things. "Praecedens" (προηγούμενος) means "preceding" or "going before", conveying the idea of something that sets the stage or provides a foundation for what follows, while "initians" (in Greek προκαταρκτικός) means "initiating" or "triggering", emphasising the role of a catalyst or an immediate cause in a sequence.[96]

To clarify these four concepts, Type 2 Diabetes Mellitus (T2DM) can be used as an example. The development of T2DM can be attributed to a combination of genetic predisposition and lifestyle factors. Those factors lead to insulin resistance and impaired glucose metabolism, eventually causing T2DM. The "causa" of T2DM refers to multiple factors collectively and the "causatio" of T2DM should be varied according to different cases. Excessive caloric intake and sedentary behaviour can be considered "a causatio" for T2DM but not "the causa" for T2DM. Usually, factors like age and ethnicity can increase the risk of T2DM, but they do not directly cause diabetes. Older age is a "praecedens" for T2DM because it sets the biological stage for

[96] Galen and Ian Johnston, *Galen on Diseases and Symptoms* (Cambridge: Cambridge University Press, 2011), 31-7.

its development by predisposing individuals to reduced insulin sensitivity. There are also some factors that influence the risk of T2DM dramatically by disturbing one's lifestyle. Huge stress can serve as an "initians" for T2DM because it can lead to poor dietary choices and decreased physical activities, which worsen the condition of the body in a short time and lead to the manifestation of T2DM. In the statement "Flatus causes pain", ten Rhijne is talking about "causa", which makes this statement extremely strong. He generally means every pain is caused by flatus and no other thing can ultimately cause the pain.

Finally, what is pain? Generally, pain is a feeling, and medically, pain is a symptom. When patients report their pain to the doctor, the doctor can make the diagnosis about affections or diseases. According to Galen, briefly, symptoms are describable conditions, while affections and diseases are continuous states of the body opposite to health.[97] Affections disappear automatically after some time, and diseases stay longer and can stay forever without proper curation.[98] The distinction between symptoms and diseases can only be blurred by damaged functions. In all other situations, the extension and connotation of these three concepts are clear. However, ten Rhijne makes his statement even stronger by defining pain as a cluster of diseases instead of symptoms. This section will later elaborate on his idea.

The Only Disease and the Only Cause

The writing of ten Rhijne is very bold. For the statement that "Flatus causes Pain", he says "Unum … est morbi genus, videlicet dolor; una est morbi causa, nempe flatus. (*there is one type of disease, namely pain; there is one cause of disease, namely flatus*)"[99] This argument challenges the knowledge held by doctors for over a thousand years: that an imbalance of humours is the cause of disease. In ten Rhijne's opinion, this view is an unenlightened parroting

[97] Galen and Johnston, *on Diseases and Symptoms*, 23-25
[98] Galen and Johnston, *on Diseases and Symptoms*, 24
[99] Willem, *Dissertatio de Arthritide,* 8-9

of others, resulting in the arbitrary attribution of a disease to some humour, which is unreliable. He attacks those people:

> Many authors choose to contradict each other and refute each other's theories rather than seek enlightenment from reason or counsel from experience, considering not so much the truth of the outcomes but the balance of preconceived opinions. Here one attributes it merely to disorder; another to a corruption of the four humours; another to cold phlegm or thin serum; another implicates both phlegm and bile; another faults the blood, calling it impure, raw, and unrefined; another sees harmful effects in saline serum from muriatic sharpness; yet another in saline spirits; still another criticizes rather than identifies bloating and the disordered secretion of the four humours.[100]

Ten Rhijne does not want to join these people. He want to explore the real cause of the disease, and his answer was flatus. To this, he roughly gives four arguments. I will briefly summarize his four arguments as follows. Because ten Rhijne's original text is richly worded, I have extracted the logic and tried to restate it in my own words. The page numbers indicated are the ranges in the original text where these arguments are presented.

The first argument is based on the experience of ten Rhijne's friend. This friend is a judge, whose testimony was considered reliable at the time. He shared his experiences with ten Rhijne about how pain related to flatus. When he was younger, he often suffered from nightmares, which only alcohol could alleviate. Every time he drank, he would feel flatus crawling through the thin vein under his skin, causing itching. Once, large pustules appeared on his abdomen and hands. When he punctured the pustules, he felt a tremendous heat on his back and his left rib began to twitch. Afterwards, when he went to sleep, he felt a large blood vessel on the left side of his spine being violently struck by flatus, some of which entered the blood vessel and pulse, and later climbed up into his head and ear canal. Subsequently, he always developed pustules,

[100] Willem, *Dissertatio de Arthritide*, 14-16. Original text: Nam plerique authores in contraria ire, suaque mentias mutuo refellere, quam a ratione lumen, vel ab experientia consilium, perere malunt, non tam eventus veritatem, quam praejudictae opinionis aequipondium, pensantes. Ubi hic nudam intemperiem; ille quatuor humorum vitia; iste frigidam pituitam vel tenue serum; alius pituita, simul & bilem peccantem; alius sanguinem, eumque impurum, crudum & απεπλον; alius serum muriatica salis acrimonia noxium; alius iterum spiritus salinus; alius denique ventositatem atque una quatuor humorum intemperien secretionem potius reprehendunt magis quam deprehendunt. (translated by ChatGPT, prompt attached in appendix)

and each time he punctured them, he felt some flatus moving inside his body, even if there was no pus out. Every night when he slept, he could feel the flatus roaming inside his body, biting his fresh. Physicians who used humoral theory had different diagnoses for this illness. One attributed it to an enharmony of bile and liver, another thought it was a blockage of the spleen, and still another believed it was black bile blocking the stomach. No matter which doctor, none could cure him. Therefore, ten Rhijne argues that humoral theory could not reveal the true cause of disease, and thus could cure the disease.[101]

Ten Rhijne argues that the cause of disease is flatus, because flatus carries various elements and qualities, wandering and permeating various organs and tissues within the human body. Moreover, flatus is more than a carrier. His second argument is an analogy, comparing the flatus inside the body with the wind on Earth. Ten Rhijne claims that the wind on Earth appears to be just a carrier, carrying cold and heat, carrying steam and cloud, as well as leaves and birds and insects. With the help of wind, clouds move, water evaporates, and the natural ecology operates. Sometimes, wind also brings danger, destroying crops and houses. However, if someone asks what the wind is. The answer should be that the wind is the sun: the sun's influence on the Earth produces wind, and through wind, all activities on Earth become possible. The flatus inside the human body is the same, especially with the connotation of pneuma. Therefore, flatus is the cause of all diseases.[102]

Ten Rhijne's third argument concerns the change of flatus causing disease. He observes that flatus inside the human body could be corrupted by various foods, drinks, and black bile, making the flatus foul and heavy. This is normal. However, once foul flatus fails to be expelled and invades the organs, it can cause disease. Ten Rhijne used gout as an example: even if a patient with gout has a swollen joint, there is not necessarily pus inside the joints. And even if

[101] Willem, *Dissertatio de Arthritide,* 21-4.
[102] Willem, *Dissertatio de Arthritide,* 26-7.

there is pus, the pain often precedes the accumulation of pus, and expelling the pus cannot truly stop the pain. Therefore, foul flatus is the real cause of the disease.[103]

Ten Rhijne's fourth argument concerns the mechanism by which flatus causes pain. Ten Rhijne pointed out that foul and heavy flatus can oppress organs and tissues. Each organ or tissue has a different structure, thus flatus affects each differently, and the corresponding sensation is also different. The liver is compact and dense, flatus cannot invade it, so it hardly feels the oppression of flatus; the stomach and intestines are dense and fine and feel a dense pain when pressed; muscles are relatively loose, thus easy to feel the pain. Fortunately, flatus usually does not gather in the muscles for long, and the pain is temporary. The bones are porous, and the foul flatus is easily gathered here, thus it is very easy to keep the pain. Based on the above arguments, ten Rhijne draws the conclusion that pain is the only disease, and flatus is the only cause.[104]

A Book of Virtues and Wonders

In fact, both the thesis and the argument of "flatus causes pain" are not appealing or convincing. However, ten Rhijne reveals something in the history of medicine in the early modern period: there were not many good treatments for diseases, and the fundamental theory of how to treat diseases was still nascent. Revolutions were happening, but they had little to do with the therapeutic methods. [105] The rise of anatomy, mechanism, or experimental medicine did not affect the medical reliance on humoral theory. However, these theories led to doubts about humoral theory, as it was seen as unable to provide a valid theoretical foundation for medical

[103] Willem, *Dissertatio de Arthritide,* 28-39
[104] Willem, *Dissertatio de Arthritide,* 40-2.
[105] Frank RG, "Thomas Willis and His Circle: Brain and Mind in Seventeenth-Century Medicine," essay, in *The Languages of Psyche: Mind and Body in Enlightenment Thought*, n.d., 107–46. 111.

problems. The alternative theory proposed by ten Rhijne, “flatus causes pain,” is an example of this scepticism towards humoral theory.

Secondly, and more importantly, were the worries about the future of medicine. Ten Rhijne was dissatisfied with the ambiguity of humoral theory and sought a clearer and more understandable medical paradigm. On the other hand, the rise of anatomy and surgery potentially prevented physicians from exploring the cause of diseases. They may, in the end, only deal with the “praecedens/initians” of diseases and lose their interest in the “causa” and can never cure any disease from the root.

Acupuncture Can Cure Diseases by Manipulating the Flatus

Arthritis is a painful disease. Galenic doctors have numerous explanations about the cause of arthritis, but none of them can cure it completely. In fact, even modern scientific medicine cannot completely cure arthritis. However, acupuncture can treat it, and according to ten Rhijne's theory, it can even cure it completely. This is because flatus is the primary cause of all diseases, and acupuncture can directly act on Flatus.

Up to the seventeenth century, when ten Rhijne studied medicine, arthritis was generally regarded as an invisible tumour that could not be cut off. Moreover, it would grow again even if could be cut. During the early modern period, gout was a common disease among the wealthy and the aristocracy, often referred to as the disease of kings or the rich man’s disease. However, However, despite so many wealthy and powerful people suffering from arthritis, which causes constant pain, no cure was found, and the cause of this disease remained unknown. The combination of such endless suffering and helpless ignorance can easily lead to despair, especially for physicians.

Ten Rhijne commented on gout, stating that treatment should address the root cause of a disease. His criticism was not without reason. He believed that each disease has its primary causes, immediate causes, symptoms, and mechanisms. Only by eradicating the primary cause can a disease be truly cured. Ten Rhijne argued that humoral theory could only explain the mechanism of gout but failed to explain its primary cause, making the treatment ineffective. He contended that the swelling or the invisible tumours mentioned by other physicians were merely symptoms of gout, not its causes. Ten Rhijne believed that the primary cause of gout was flatus, a conclusion derived from his doctoral thesis.

When ten Rhijne wrote his doctoral thesis about the relationship between flatus and pain at Leiden University, he did not choose arthritis as his focus. Naturally, he did not propose any innovative cure to relieve the suffering of human beings. However, when he went out from Europe, he suddenly heard about the cure for arthritis, which could be perfectly integrated with the argument of his doctoral thesis. Acupuncture and moxibustion can directly affect the flatus within the body. A map of points can serve as locations to regulate the flatus. With the knowledge of points, physicians can treat diseases from their primary cause by directly manipulating the flatus.

Ten Rhijne's introduction to acupuncture and moxibustion is promotional rather than practical. He does not tell readers where to insert the needles or for how long to treat gout or other diseases. Instead, he theoretically explains that acupuncture and moxibustion can treat all diseases. In other words, after reading his book, readers do not know how to perform acupuncture or even how to treat gout. However, readers might become interested in acupuncture or moxibustion techniques and thus study the flow of flatus within the body, leading to the treatment of diseases.

The Finding as a Bless

Ten Rhijne had already developed the argument that "flatus causes pain" before going to Japan but could not direct this argument towards practical application. After travelling to Japan, he discovered that acupuncture could practically prove his theory and even offered hope for treating many intractable diseases like gout. This academic journey was also a kind of religious experience for ten Rhijne, as he came to see acupuncture as a divine gift. This section will elaborate on ten Rhijne's theological understanding of this matter.

Ten Rhijne was not a theological expert, and his understanding of the relationship between nature, God, and knowledge was not as obscure as his arguments about pain and flatus; on the contrary, it was quite simple and interesting. In short, he linked virtue, knowledge, and God's gifts together, joyfully exploring places outside Europe and choosing knowledge. He did not define what virtue is, but directly praised knowledge. Ten Rhijne cited the story of Pierre Bayle on the boat to illustrate his position. Bayle was a renowned French philosopher and an important sceptic. He believed that human reason and senses are limited, thus we are unable to obtain absolute and certain knowledge, even in authoritative fields like science and religion, which are full of contradictions and uncertainties. Therefore, he emphasised critical thinking and constant questioning, advocating for the advancement of knowledge through the examination of different viewpoints. However, once, Bayle encountered a storm during a sea voyage, and everyone on board was very frightened. While other passengers were praying and panicking, Bayle remained very calm. When asked why he was so calm, he replied that he believed God would protect them.

Ten Rhijne's voyages across the seas encountered shipwrecks no less severe than those Bayle experienced. Yet, he elevated scepticism to a new level:

> "Will dormant industry thus conceal thorough investigation? Let's lift our spirits and behold! Darkness itself will spur us on; let's disdain these empty fears; let that rebellious complexity of challenges affect the cowardly and the ignorant alike; Those who, having dismissed everything, would rather hold all in abeyance than weigh matters with scrupulous and appropriate scrutiny, Preferring to hastily embrace any opinion, weary of searching for the Truth, rather than persisting in exploration with stubborn diligence. Yet among them, there seems to be no stable judgment of truth, as they spread doubts about themselves that turn into uncertain opinions. Thus, trapped in the sticky mire of ignorance, they are plunged into the chasm of habitual laziness. It will be reborn, through diligent efforts, the angel-bearer, Archimedes' little bird, the genius of Chemistry that delights the intellect, who will direct the artisan's hands to the very depths of the earth; Even more fortunate than the ancient Argonauts will rise again, sailing to a new Colchis to return with spoils richer than the golden fleece." [106]

Ten Rhijne viewed human ignorance as a potential for knowledge, thereby enabling people to continually explore knowledge and enjoy the pleasure within. He did not address the philosophical implications of uncertainty but rather discussed the emotional fear of this uncertainty—which he considered immoral. He believed that people should weigh things with rigour and appropriate scrutiny in order to attain truth. Clearly for ten Rhijne, truth was not a final answer but rather knowledge verified piece by piece, a flower with its own knowledge, a drop of water with its own knowledge. Each piece of knowledge is worth exploring, every bit of exploration is pleasurable, and all are virtues.

Ten Rhijne's understanding of knowledge was an important part of his worldview. Like those colonial scientists criticised for Eurocentrism, ten Rhijne also viewed the world's peoples with a full set of stereotypes, judging their appearance and customs often in a derogatory manner. [107]However, at the same time, ten Rhijne acknowledged that God shows mercy to humanity,

[106] Willem, *Dissertatio de Arthritide*， 226-7. Ergone prosumdum sopita pervestigationis abscondet industria? Erigamus animos nostros & en! Ipsa obscuritas addet calcaria; vilipendamus inania haec pavorum terriculamenta; ignavos partier & ignaros percellat seditiosa illa difficultatum complication; hos, inquam qui damnatis omnibus universa malunt suspendere, quam scrupuloso & decente examine rerum soliditatem librare, taedio investigandae Veritatis cuilibet opinioni temere potius succumbentes, quam in explorando perrinaci diligentia perseverantes; Sed in illis non videtur veri stabile esse judicium; quoniam diffidentem de se spargunt suspicionem, quae in incertam opinionem migrat; unde hi ignorantiae visco oblici, in consuetum desidia praecipitantur barathrum. Renascetur etiam, sed sedulis, angeliophora Archimedis avicula, quae intellectum deliciat Chymiae genius, qui ad intestina tellus diriget artificis manus; resurgent etiam beatiores priscis Argonautae, & in aliam Colchidem navigabunt, ut ditiores, quam auro vellere, praeda redeant.

[107] Willem, *Dissertatio de Arthritide,* 274-301

thus equally enhancing the natural knowledge around the world. The natural knowledge possessed by uncivilised people was no less than that held by regions engaged in long-term research and exploration.[108] Different places have different plants, and the local people use various parts of these plants to make useful medicines, from which Europeans can also benefit. Ten Rhijne never considered the natural knowledge possessed by non-Europeans to be inferior to that of Europeans. He thoroughly enjoyed exchanging knowledge with these people and found pleasure in it. Based on such views, ten Rhijne was able to tolerate various norms of Japanese society. Despite often complaining verbally about Japanese society and disliking the Japanese people's excessive pursuit of power, he still genuinely admired the natural products and knowledge that the Japanese possessed.

Ten Rhijne believed moxibustion is a gift from God to the Japanese. In ancient Europe, it was also known that gout was caused by flatus, but there was no herb like moxa suitable for burning the skin, thus no cure could be found. However, Japan had such an herb, *moxa*, which keeps a low temperature when burning and so it was possible to explore treatments for gout, ultimately leading to the discovery of precise acupoints and such accurate methods of treatment. Ten Rhijne brought back to Europe images of moxa and charts of acupoints. This was not only a curiosity from a foreign land, but also a gift from God.

[108] Willem, *Dissertatio de Arthritide, 95.*

CHAPTER 3 ANATOMY AND THE PREFERENCE OF ACUPUNCTURE OVER MOXIBUSTION

Although nowadays acupuncture is more widespread than moxibustion, the *Dissertatio de Arthritide* values both techniques equally, which is in accordance with the situation in early modern China and Japan. This chapter examines the influence of the *Dissertatio de Arthritide,* focusing on the debates around the acceptance and rejection of acupuncture and moxibustion.

In both Chinese and Japanese, acupuncture (鍼術) and moxibustion (灸術) often appear together, forming a compound word "鍼灸". This is consistent with the practices in Chinese and Japanese contexts: acupuncture and moxibustion can substitute for and complement each other. In the texts of Busschof and ten Rhijne, "鍼灸" is translated into "acupuncture and moxibustion." This translation preserves the original meaning, but due to the conjunction "and," it is easy for readers to think that acupuncture and moxibustion are two separate techniques. The discussions for accepting and opposing them are also separate. As already argued in Chapter 2, acupuncture and moxibustion were known to Europeans as promising techniques for treating gout, without being transmitted together with Chinese or Japanese medical theories. Therefore, the discussions on acupuncture and moxibustion are primarily based on European medical theories of that time. With ten Rhijne's detailed explanation, acupuncture mainly relates to pneuma and fluid circulation theories, and serves as a support to those theories. Meanwhile, moxibustion, due to its similarity to the cauterisation methods in European medicine, relates to the humoral theories and is difficult to be accepted. Additionally, because of the poor needle-making technology in Europe at the time, acupuncture was not practised but highly anticipated. In contrast, moxibustion was easily attempted, and numerous ineffective cases of moxibustion accelerated European rejection of it. Moreover, the burning involved in

moxibustion is very close to witchcraft. In summary, moxibustion was rejected by Europeans, while their interest in acupuncture continued until the day Europeans could produce acupuncture needles themselves.

Anatomy or Humoral Theory

Anatomy and Acupuncture

As previously mentioned, ten Rhijne's *Dissertatio de Arthritide* comprises six essays, with the first three centred around discussions on gout and acupuncture. The first essay describes how acupuncture and moxibustion can treat gout: Flatus cause; acupuncture and moxibustion act on flatus. The second essay discusses the points for acupuncture and moxibustion, including four graphs from China and Japan. In the first two essays, acupuncture and moxibustion are always mentioned together. However, the third article is solely titled *De Acupunctura*, and only discusses the use of acupuncture, omitting moxibustion. The reason for this well revealed in the preface of the third chapter, namely because acupuncture is indeed a very delicate technique, while moxibustion might not.

Before the discussion, ten Rhijne quoted Cornelius Celsus, who believed that an excellent doctor should be: "He should be a young man or at least close to adolescence, with a strong and steady hand that never trembles, equally skillful with the left hand as with the right, with sharp and clear eyesight" [109] thus emphasising the physical dexterity required of a doctor. Ten Rhijne thought that a doctor's physical dexterity could be classified into three levels, each more meticulous than the last.[110] The first level is carpentry, where doctors use medical instruments such as trephines, wedges, respatoria, elevators, forceps, and saws. Most doctors are at this

[109] Ut sit adolescens aut certe adolesentie propior, manu strenua, stabili, nec unquam intremiscente, eaque non minus sinistra, quam dextra, promptus, acie aulorum acri, claraque. (Willem, *Dissertatio de Arthritide*, 171)
[110] Willem, *Dissertatio de Arthritide*, 171.

level, but humans are more delicate than wood, making such surgery of limited use.[111] The second level is that of metalworking, which uses tools and creates tools based on the material and technical requirements. Doctors at this level can discern specific situations and use custom tools.[112] The third level involves doctors akin to tailors, who need only needle and tread but possess excellent skills. Such doctors can perform delicate suturing on human wounds, remove cataracts from the eyes, and eradicate fungal hyphae from the ears without causing additional burdens to the patient, among other things.[113] Acupuncture clearly belongs to such a finely skilled technique, and therefore deserves meticulous attention.[114]

Comparing doctors to craftsmen is not a novelty in the history of Western medicine. Hippocratic medicine believes that, although the human body has a certain self-healing capability, doctors still need to apply specific techniques to intervene with patients.[115] "…if a man demand from an art a power over what does not belong to the art, or from nature a power over what does not belong to nature, his ignorance is more allied to madness than to lack of knowledge."[116] Both the self-healing capability of humans and the effectiveness of technique are limited; doctors must possess knowledge of both. The former explores natural knowledge, while the latter must refine their own craftsmanship.[117] However, Hippocratic medicine does not emphasise the precision of craftsmanship, but rather the intensity of the techniques and their limitations. "Those diseases which medicine do not cure, iron cures; those which iron cannot cure, fire cures; and those which fire cannot cure, are to be reckoned wholly incurable"[118]. This famous quote from Aphorisma well illustrates Hipporates's view: if a disease cannot be cured with iron,

[111] Willem, *Dissertatio de Arthritide*, 172-3.
[112] Willem, *Dissertatio de Arthritide*, 173-4.
[113] Willem, *Dissertatio de Arthritide*, 175-6.
[114] Willem, *Dissertatio de Arthritide*, 177.
[115] Robert Bartz, *Hippocratic Practice: Context and Ethos* (dissertation, eScholarship, University of California, 1998). 38-46
[116] Bartz, *Hippocratic Practice*, 45.
[117] Bartz, *Hippocratic Practice*, 46.
[118] Hippocrates, *Aphorisms*. Translated by Francis Adams.

meaning surgical tools, doctors do not need to master more refined surgical techniques but should instead use more intense cauterisation techniques, and cauterisation also has its limitations, and not all diseases can be cured.

Ten Rhijne's emphasis on physical dexterity reflects the influence of humanism on medicine. Humanism emphasised the study and revival of classical knowledge, but did not regard classical authors as authorities, instead emphasising individual dignity. In medicine, humanism encouraged a more personalised approach, reflecting on the dogmatism of medicine under theological concerns. This more personalised medicine often integrated multiple disciplines, such as anatomy, chemistry, botany, and philosophy. Andreas Vesalius is a representative of using anatomy to reflect on Galenic medicine; his dissections were extremely detailed, concerning not only the viscera but also muscles and bones.

Ten Rhijne's notion around acupuncture would be highly related to the rise of the anatomy of muscles and bones. This kind of anatomy is related to not only the muscles and bones but also the systems of blood, lymph and nerves, all of which reach throughout the body. The second essay of *Dissertatio de Arthritide*, *Mantissa Schematica,* contains detailed information on flowing the Flatus around the body according to Chinese and Japanese knowledge. The book review of *Dissertatio de Arthritide* in *Philosophical Transactions of the Royal Society*, the highly respected and influential scientific journal first published in 1665, summary the content of this essay as "a brief account of their [Chinese and Japanese] Physick and anatomy".[119] The following discussion around acupuncture was mostly around the argument and description of ten Rhijne, led by the German physician Engelbert Kaempfer (1651-1716). Their discussions always jointly mention acupuncture and moxibustion, valuing the medical importance of

[119] "An Account of a Book, Viz. Wilhelmi Ten Ryne M.D. &C. Transisalano Daventriensis, 1. Dissertatio de ARTHRITIDE. 2. Mantissa Schematica: 3. de ACUPUNCTURA. 4. Orationes Tres. Sc. De Chymiae & Botanicae Antiquitate & Dignitate. De Physiognomia. De Monstris. Londini in 80. 1683.," *Philocophical Transactions* 13 (1683): 222–35.231.

specific sites, and on this basis, they explore the diseases that acupuncture might cure. Comparing the acupuncture diagrams drawn by Ten Rhijne with those from China or Japan, There is an obvious difference: Ten Rhijne's acupuncture drawings use perspective techniques, presenting a three-dimensional effect, while the acupuncture diagrams from China and Japan are flat. However, the difference between ten Rhijne's acupuncture diagrams and the contemporary European anatomical understanding of human body is larger. Nevertheless, Ten Rhijne did not view the 'anatomical knowledge' upon which acupuncture and moxibustion depend through a lens of cultural relativism, and did not consider them to be entirely alien to Western anatomy. Ten Rhijne found that the anatomical and treatment methods of China and Japan were vastly different from those in the West, fully understanding the potential distrust or even skepticism, thus he proposed verifying or refuting this technique through observation and experimentation.[120] Anatomists should seize the opportunity to examine the structures of these channels and points on the human body during dissection to enrich their anatomical knowledge. Within this framework, Ten Rhijne provided a very detailed introduction to the 'anatomical knowledge' of China and Japan. The acupuncture charts he provided were not merely rough indications but were accompanied by detailed explanations, such as "Each of these arteries is eight feet"[121] or "the length of these arteries is six and a half feet"[122], "*Yn kio* begins from the outer malleolus and ends in the eyes"[123] Ten Rhijne's descriptions, combined with the diagrams, can help readers accurately locate the acupuncture points and also guide anatomists to verify such anatomical knowledge.

[120] Willem, *Dissertatio de Arthritide*, 165.
[121] Willem, *Dissertatio de Arthritide*, 166.
[122] Willem, *Dissertatio de Arthritide*, 167.
[123] Willem, *Dissertatio de Arthritide*, 168.

Engelbert Kaempfer was a German physician who worked at Dejima as a station Doctor from 1690 to 1692.[124] His also wrote about acupuncture and brought a picture of the acupoints. His diagrams appear not to use any perspective, but in fact, they are more refined than those of Ten Rhijne. On one hand, he adopted the Japanese style of drawing acupuncture charts with front and back views; on the other hand, he outlined the muscular lines from two perspectives on the basis of the human body's flat plan. As a result, the human body presented not only reconstructs the Japanese instructions for acupuncture points but also conforms to European habits of anatomical illustration.Kaempfer held a similar attitude towards acupuncture as ten Rhijne. He thought "foreigners are no less subject to it than natives"[125], which means he think acupuncture is not only a Japanese thing but also a universal technique. Plus, he emphasised the importance of precisely acting on the right points, which is also accorded with ten Rhijne's cautious of the locations of the points.

Following the detailed description of points, both ten Rhijne and Kaempfer recorded the practices of needle-piercing according to their observations and understanding. They are caring the same things: the features of the needle, and how to pierce the skin. Ten Rhijne recorded that the needle should be long because it sometimes insert deep, be sharp for easier penetrating and be round for rotating. He also mentioned that the Japanese need to import acupuncture needles from Korea because the Japanese cannot manufacture them. Kaempfer recorded that there are two kinds of needles, one can be either golden or silver and small enough to be kept in a small hammer; another is only made of silver, long sharp and thin and be kept in a long wooden box. The difference between their descriptions and pictures may imply neither of them had

[124] Wolfgang Michel, "On the Background of Englbert Kaempfer's Studies of Japanese Herbs and Drugs," *Journal of the Japanese Society for the History of Medicine* 48, no. 4 (2002): 692–720, 719.
[125] Engelbert Kaempfer, *The HISTORY of JAPAN; GIVING An Account of the Ancient and Present STATE and GOVERNMENT of That EMPIRE; OF Its Temples, Palaces, Castles and Other Buildings; OF Its Metals, Minerals, Trees, Plants, Animals, Birds and Fishes; OF The Chronology and Succession of the EMPERORS; Ecclesiastical and Secular; OF The Original Descent, Religions, Customs, and Manufactures of the Natives, and of Their Trade and Commerce with the Dutch and Chinese. Together with a Description of the Kingdom of Siam.* , vol. II (London: SCHEUCHZER, 1727).29

investigated into the needle market in Japan, and make their description based on a few sets of needles. From my perspective, they also did not gather enough information about the practices, otherwise, they would have witnessed more varieties of needles. Plus, their description of the practical procedure seems like a description of only few observations. What had been mentioned included the way of holding the needle and the methods to penetrate, while the diagnostic procedure and the variations of conducting acupuncture have not been revealed in their book. Although the authors mentioned physical dexterity, they also did not mention the training of physicians and how can they achieve such physical dexterity, which provided readers with hardly any opportunities to repeat the practice of Japanese people.

Although ten Rhijne and Kaempfer did not claim it directly, their European readers perceived acupuncture as a possible advanced technology of surgery, instead of an exotic way of curing. Ten Rhijne, as has been explained in Chapter II, did not restrict acupuncture for healing gout. His argument "Flatus causes Pain" paved the possibility for acupuncture to cure any disease. Kaempfer in his book stated that acupuncture and moxibustion are "proper in all distempers, where an occult vapour, and which lies, as it were, imprisoned within the body, occasions a dissolution of the solids, and a sense of pain, and hinders the affected part from duly performing its functions."[126] In the surgery textbook of Lorenz Heister, an influential German surgeon and anatomist, both ten Rhijne and Kaempfer have been mentioned if the reader wants to know more about acupuncture.[127] However, all ten Rhijne, Kaempfer and Heister had never undertaken actual experiments to give some merits to acupuncture.[128] Besides a few tries in France, the European acupuncture practices had not started until the early 19th century.[129] James

[126] Kaempfer, *The HISTORY of JAPAN,* 38.
[127] Ruben E. Verwaal, "Hippocrates Meets the Yellow Emperor: On the Reception of Chinese and Japanese Medicine in Early Modern Europe" (dissertation, 2009). 44.
[128] James Morss Churchill, *A Treatise on Acupuncturation : Being a Description of a Surgical Operation Originally Peculiar to the Japonese and Chinese, and by Them Denominated Zin-King, Now Introduced into European Practice, with Directions for Its Performance, and Cases Illustrating Its Success* (London: Simple and Marshall, 1821).10.
[129] Churchill, *A Treatise on Acupuncturation,* 10-1.

Morss Churchill(1796-1863), a British physician and surgeon stated in his monograph *A Treatise on Acupuncturation* that

> "The method of performing the operation of acupuncturation is simple and easy, requiring neither practice to give dexterity, nor adroitness that it may be done with propriety. Anatomical knowledge of the human body is, however, necessary; as an imprudent application of it, by an operator ignorant of the structure of the part into which he introduces his needle, might be productive of bad consequences."[130]

In the description of Churchill, the performing of acupuncture does not require practice for dexterity, which at first glance is contradict to ten Rhijne's emphasis on physician dexterity. However, there is not conflict between the two. Ten Rhijne, as well as Kaempfer, while emphasising the importance of dexterity, did not argue that it was the practice that made dexterity. Instead, what guarantees the dexterity is the anatomical knowledge.

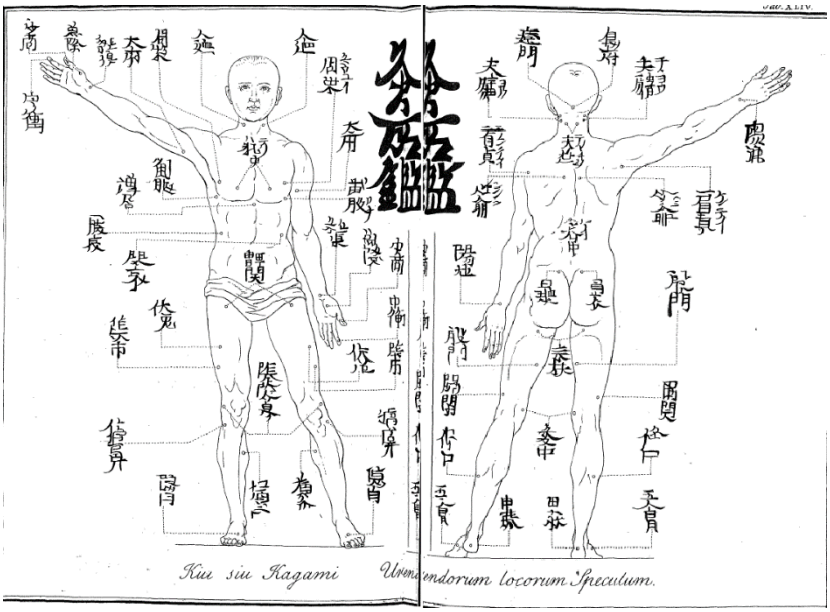


Figure 3 Acupuncture diagram from Kaempfer

[130] Churchill, *A Treatise on Acupuncturation*, 13.

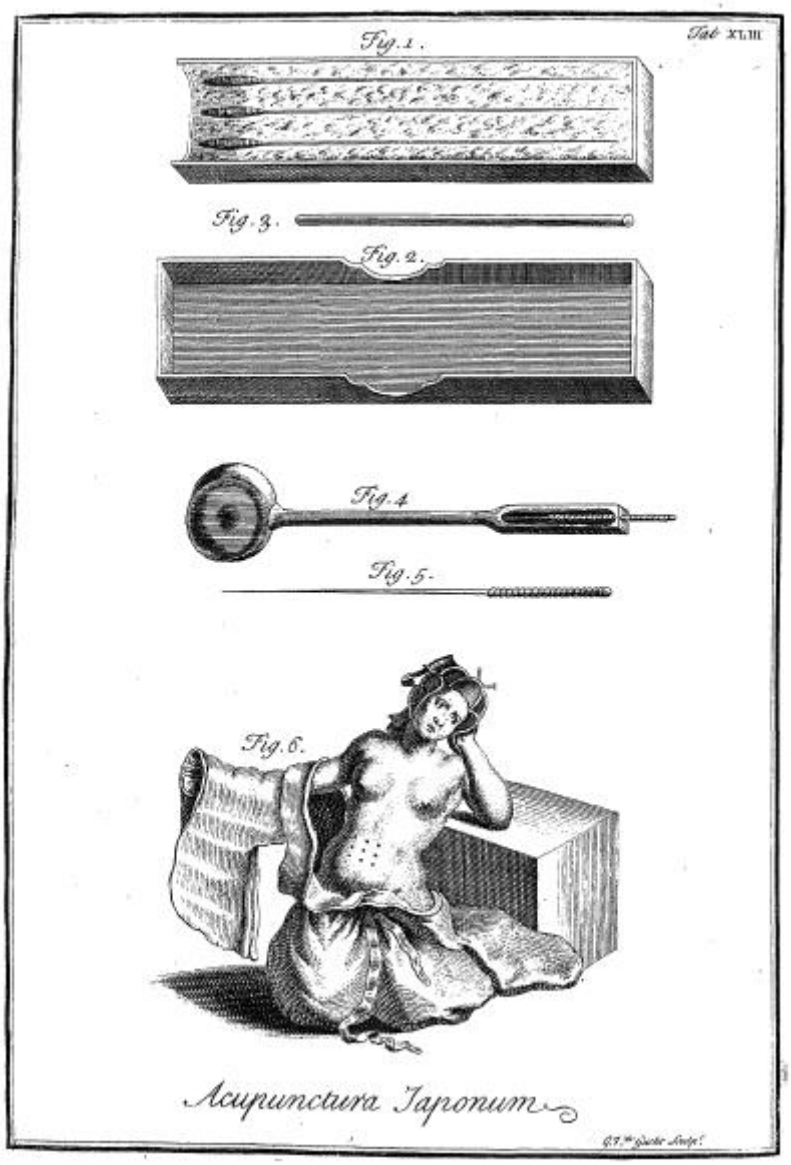


Figure 4 Needle from Kaempfer Book

Teleology and Mechanism in Anatomy

The term dexterity originates from the Latin word "dexter," meaning "right-handed," commonly associated with skill or adroitness in performing tasks. In the medical context, dexterity refers to not only physical skill and precision but also intellectual acumen and adept decision-making. In medieval times, dexterity should be mostly related to barber-surgeons, who were both barbers and practitioners of minor surgery. Barber surgeons usually receive very limited medical education, which is more theoretical. This theoretical medical education,

provided by monasteries and later universities, was generally accorded with the presumption of teleological. A significant change in the attitude towards dexterity was marked from the Renaissance to the Enlightenment with the rediscovery and re-examination of classical texts. Physicians and anatomists like Andreas Vesalius brought dexterity into academic medicine, emphasising precise anatomical knowledge, which led to a transformation into mechanism.

Teleology explains phenomena based on their purpose or goal. In the anatomical context, a teleological perspective looks at the structures and functions of the parts of the body in terms of the contributions to the survival or well-being of the organism. On the contrary, the mechanism views every phenomenon as reducible natural processes and provides physical and chemical interactions. Applying mechanisms to anatomy may imply that the human body is like a machine, and doctors can fix a human body like fixing a machine. In early modern times, teleology and mechanism coexisted and competed in the field of anatomy. For example, Harvey discovered the blood circulation, which aligns with mechanism; while he also argued that blood circulation should not be understood with the purpose of well-being: "nature does not attend to shape, location, magnitude but for the sake of strength and for the batter, for protection, or as a sine qua non".[131]

The concepts of *actio*, action, and *usus*, use, are central to understanding how Harvey located himself between teleology and mechanism. *Actio* refers to the actions or operations of bodily parts, while *usus* relates to the purpose and utility of these actions. In Harvay's framework, anatomy was not merely about describing bodily structures but also about understanding the actions these were designed to achieve.[132] Descartes, who stood closer to mechanism than

[131] Peter M. Distelzweig, "Descartes's Teleomechanics in Medical Context: Approaches to Integrating Mechanics and Teleology in Hieronymus Fabricius AB Aquapendente, William Harvey, and René Descartes," *Descartes's Teleomechanics in Medical Context: Approaches to Integrating Mechanics and Teleology in Hieronymus Fabricius Ab Aquapendente, William Harvey, and René Descartes* (dissertation, 2014). 145
[132] Distelzweig, Descartes's Teleomechanics in Medical Context, 156.

Harvey, choose *functio,* function, instead of *actio* in his anatomical framework. While *usus* is still kept to hint at a teleological perspective, *functio* refers to the the action of a body part in a mechanistic sense.[133]

The main difference between stand points of Harvey and Descartes on anatomy is their attitude towards the final causes. Descartes aimed at a mechanistic universe and rejected the final causes, or he interpreted the final causes in a way that aligned with mechanism. However, Harvey claimed that circulation is the final cause of all the body phenomena, health or illness.[134] He advocated anatomists and also doctors to pay attention to the heart and the circulation, thus getting the most benefit of well-being out of it.[135]

The structure of Harvey's argument that blood circulation is the final cause of the body phenomena and physicians should focus on heart is similar to ten Rhijne's argument that Flatus is the cause of every pain and every disease and physicians should know about it and learn acupuncture. This structure that something is the final cause for all the anatomical phenomena and physicians should focus on it is a common model during the early modern times. Descartes also uses this structure, only his final cause is the mechanism. Hieronymus Fabricius (1533-1619), an Italian anatomist and the teacher of Harvey, adopted a mathematical final cause: while explaining the body phenomena with mechanical descriptions, he employed a non-reductive character in his anatomy by making mathematics the fundamental accounts.[136]

The discussion about the final cause is under the impact of the Protestant Reformation. Confessional beliefs played a significant role in shaping the field of anatomy. [137]At protestant universities, anatomy was taught not only as a scientific subject but also as a means of

[133] Distelzweig, Descartes's Teleomechanics in Medical Context, 187-9.
[134] Distelzweig, Descartes's Teleomechanics in Medical Context,152-7.
[135] Distelzweig, Descartes's Teleomechanics in Medical Context,156.
[136] Distelzweig, Descartes's Teleomechanics in Medical Context, 98.
[137] Jürgen Helm, "Protestant and Catholic Medicine in the Sixteenth Century? The Case of Ingolstadt Anatomy," *Medical History* 45, no. 1 (January 2001): 83–96, https://doi.org/10.1017/s0025727300067405.

understanding the divine creation. In those universities, anatomical studies were more likely to be incorporated into broader theological discussions and used to reinforce religious doctrines and the creation and structure of the human body. The investigations and discussions were generally encouraged, and new knowledge can be continuously produced. Conversely, Catholic universities while cautious accepted the new anatomical findings such as Andreas Vesalius's anatomy, emphasised continuity with past knowledge. Individual commentaries on anatomy are not encouraged in those institutions, and Galenic anatomy kept its domination. Ten Rhijne received his medical education from Leiden University, which has been a Protestant University from the beginning. As a matter of fact, all the physicians who have favoured anatomy have a closer relation to protestant medicine. In Churchill's *A Treatise on Acupuncturation*, four anatomists were listed as "men of talent and reputation, to recommend" acupuncture, and three of them received protestant medical education: ten Rhijne and Kaempfer received doctoral degrees from Leiden University, Govert Bidloo(1649-1713) studied medicine at the University of Franeker and become a professor of anatomy at the Leiden University

The only exception is Félix Vicq-d'Azyr (1748-1794), a French physician and anatomist. The 18th-century French was predominantly Catholic. Although the writing time of Vicq-d'Azyr is almost one hundred years later than ten Rhijne and Kaempfer, the difference between him and ten Rhijne can also be interpreted by the divergence between Protestant anatomy and Catholic anatomy. In the writing of Vicq-d'Azyr, no diagram was attached and consequently, no specific description about where to insert the needle was marked down. Instead, Vicq-d'Azyr paraphrased ten Rhijne's argument about flatus and related it to the vital force within human bodies.[138] Plus, unlike ten Rhijne and Kaempfer, who regard acupuncture as a technique which can be applied on Europeans and communicated with European medicine for granted, Vicq-

[138] Félix Vicq-d'Azyr , *Encyclopédie Méthodique Par Ordre de Matières Par Une Société de Gens de Lettres, de Savans et d'Artistes*, vol. 1 (Paris: Panckoucke, 1787). 185-186

d'Azyr propose a boundary between Japanese/Chinese medicine and European medicine by medical systems: "That the system, accredited among the peoples of China and Japan, based on these supposed malevolent humour which they believe to be released through acupuncture, is no more ridiculous than many other systems, and is not thoroughly examined."[139] Given the time gap between the texts of Vicq-d'Azyr and those of Ten Rhijne or Kaempfer, the differences in their content could perhaps be explained as a change in the attitude of Europeans towards acupuncture over time. The discussion of acupuncture in Europe is not abundant, and Vicq-d'Azyr's text cannot be corroborated with other texts, making it difficult to determine which interpretation is correct.

Generally speaking, ten Rhijne and Kaempfer aligned with the Protestant influence on anatomy, which empowered anatomists to present their views on the human body actively and examine them through observation and experimentation.[140] This framework allowed the understanding of human anatomy in China and Japan to coexist with the seemingly distinct European anatomical perspective, subjecting both to empirical verification. However, not all early modern anatomists viewed acupuncture through this lens. Vicq-d'Azyr, for instance, regarded acupuncture as being based on principles that were heterogeneous to European medicine. Overall, the early modern European medical discussions about acupuncture were led by physicians and were closely linked to the prevailing medical ideas of the time.

Moxibustion and Leeuwenkoek's Experiments

In the discussions above, acupuncture and moxibustion are often mentioned together, but acupuncture tends to be described in more detail due to its use of specific tools such as needles.

[139] Que le système, accrédité parmi les peuples de la Chine et du Japon, sur ces prétendues humeurs mal-faisantes auxquelles ils croient donner issue par l'acupuncture, sans être plus ridicule que tant d'autres systèmes, n'est point sondé. (Vicq-d'Azyr , *Encyclopédie Méthodique,* 188)
[140] Helm, Protestant and Catholic Medicine in the Sixteenth Century, 84-5.

Moxibustion has also undergone related anatomical discussions, but it has been the subject of different discussions outside of those. The leaders of this discussion were primarily two religious figures: Herman Busschof, previously mentioned, and William Temple (1881-1944), an English priest. Both suffered from gout and were cured by moxibustion. They published their stories of suffering and cure, which garnered widespread attention at the time. However, because they did not receive advanced medical education, they did not deeply concern themselves with the intricacies of acupuncture and moxibustion techniques, instead describing moxibustion as a burning technique from the East. Their explanation of moxibustion was simple: burning moxa can expel moisture from the body.[141] Influenced by their writings, the discussion about moxibustion fell into the framework of humoral theory, questioning why burning mugwort was special. This discussion was eventually disproven by the experiments of Leeuwenhoek, who showed that mugwort had no special properties compared to other burning substances.

In my view, it is entirely reasonable for Busschof and Temple to have sparked another discussion. On one hand, the “medical advancements" of ten Rhijne's time were convoluted, with more discussion than definitive conclusions. Discussions surrounding acupuncture appeared to be about a needling technique, but were about contemporary medical issues, attracting a limited audience. In contrast, the two priests' use of their personal experiences to promote pain relief was much more compelling. On the other hand, the narratives of Busschof and Temple, from removing moisture with fire to the burning method, completely aligned with the public's understanding of medicine at the time, making it easier to disseminate.

However, the theory that moxibustion removes moisture by burning is difficult to be verified as it does not show any distinction or effectiveness compared to traditional burning methods.

[141] Hermann, *Two treatises*, 11.

There is no reason to believe that moxibustion is effective while the long-standing European method cauterization is not. Upon hearing about moxibustion, the microbiologist Leeuwenhoek sought to obtain some moxa and used cotton and chestnut fluff as controls to compare their burning properties. Leeuwenhoek found that the burning of moxa was no different from that of cotton, leading to the conclusion that moxibustion does not possess any miraculous effects.

> "I have taken very near the same quantity of Moxa, Cotton, and the matter which lies within a chesnut against the red outer skin thereof, and butnt them together one by the other, and I have seen, that they all three, after burning, left behind them an oleous matter; but the Moxa most: which may proceed from hence, that though there seemed to be the dame quantity of all, yet the Moxa held more, it being finer than Cotton, and therefore lying closer together, and consequently yielding more oyl. Whence it appears, that Mr. Busschof had not so good reason to extol the Moxa and its preparation above Cotton or other the like substance."[142]

Leeuwenhoek's experiments did not involve any anatomical components; they merely verified that the substance moxa, when burned, behaves no differently from materials like cotton. He published his experimental results in the Philosophical Transactions of the Royal Society, directly challenging the reliability of moxibustion.

Leeuwenhoek was best known for his lensmaking and is named the "father of microbiology" due to his pioneering work in the development and use of the microscope. Despite his esteemed reputation in the scientific community, Leeuwenhoek did not receive any formal university education. He was mostly self-taught, which may explain why his examination of moxibustion did not incorporate any anatomical knowledge—such knowledge is intricate and complex, making it difficult to master through self-study alone.

The burning experiments Leeuwenhoek conducted on moxa were quite simple, but due to his significant reputation, they stirred considerable reaction in the academic world.[143] For example,

[142] Antoni van Leeuwenhoek, "Mr. Leeuwenhoeks Letter Written to the Publisher from Delff the 14th of May 1677, Concerning the Obervation by Him Made of the Carneous Fibres of a Muscle, and the Cortical and Medullar Part of the Brain; as Also of Moxa and Cotton," *Philocophical Transactions* 12 (1677): 895–99.896.
[143] Verwaal, "Hippocrates Meets the Yellow Emperor", 20.

English physician Thomas Sydenham (1624-1689) stated in his monography that moxibustion has nothing special. This statement was possibly influenced by the publication of Leeuwenhoek.[144] It can be said that the discussion about moxibustion, sparked by the two priests' advocacy, began and ended due to the influence of who talked about it; the scientific debate involved was minimal.

Needle and Practice

Overall, the academic focus on anatomy closely linked the discussions of acupuncture and moxibustion with the scientific issues of the time, and acupuncture received greater attention due to its involvement with needles, which were unfamiliar to Europeans. In terms of attention to needles, the medical community and non-academics displayed two starkly different attitudes. Those unfamiliar with anatomy showed little interest in acupuncture, even considering it bizarre and superstitious, whereas those versed in anatomy were fascinated by the meticulous technique of acupuncture.

Busschof and Temple did not mention acupuncture while praising moxibustion, possibly because they had not tried the technique or perhaps they were biased against both acupuncture and moxibustion. Busschof initially was unwilling to try moxibustion but decided to after an "Indian doctoress" cured his daughter.[145] Temple was willing to try moxibustion based on his trust in Busschof, saying, “I never thought it would have befallen me to be the first that should try a new experiment, any more than to be the author of any new invention, being little inclined to practice upon others, and as little that others should practice upon me.”[146] He only attempted the method after Busschof’s successful treatment and publication of his book.[147]

[144] Verwaal, “Hippocrates Meets the Yellow Emperor”, 19.
[145] Hermann, *Two treatises,* A3.
[146] William Temple, *Miscellanea* (London: F.C., 1681), 185.
[147] Temple, *Miscellanea*, 199-202.

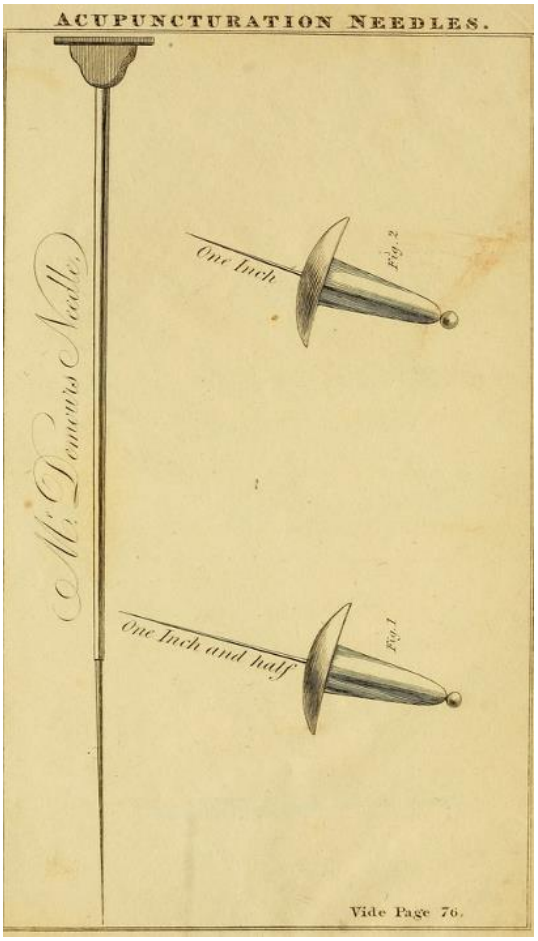
Some doctors, despite being well-trained with medicine, remained skeptical and cautious about ten Rhijne's introduction due to a bias towards chemical medical research. For example, the German doctor Georg Ernst Stahl held a completely negative view of acupuncture, believing that ten Rhijne's narratives involved excessive reasoning aimed at persuading ordinary people to try acupuncture.[148] His argument was completely biased since ten Rhijne did not write for common audiences and there were not many opportunities for common people to try acupuncture. Stahl, a doctor, chemist, and alchemist, was a follower of Paracelsianism, which emphasized localism in medicine, promoting local plants, minerals, and therapies.[149] Paracelsians even believed that Europeans should focus on their own local knowledge rather than scouring the world. In his book on herbs, *Herbarius* Paracelsus displayed a negative attitude even towards herbs from Southern Europe. Thus, it can be inferred that Paracelsians likely held a negative view of moxa.

Anatomists, however, were very interested in the use of acupuncture. Even Vicq-d'Azyr, who was not interested in Chinese/Japanese "anatomy," described the needles and their specific operations in detail. Ten Rhijne and Kaempfer's descriptions, based on their observations in Japan, suggested that acupuncture should use gold or silver needles. Vicq-d'Azyr's detailed descriptions reviewed and commented on those of ten Rhijne and Kaempfer, covering aspects like the material, length, design, and handling of the needles, methods of insertion, rotation, duration of retention, etc.[150] Vicq-d'Azyr's thorough commentary, although lacking specific practical cases, showed his serious consideration of acupuncture's operations.

I do not know where ten Rhijne and Kaempfer learned that acupuncture needles must be made of gold or silver. For such a common medical tool in China and Japan, such costly fabrication

[148] Haug Verlag, *Die Geschichte Der Akupunktur* (Heidelberg: Pilger-Druckerei, 1976), 38.
[149] Alix Cooper, *Inventing the Indigenous: Local Knowledge and Natural History in Early Modern Europe* (Cambridge: Cambridge University Press, 2009).
[150] Vicq-d'Azyr , *Encyclopédie Méthodique*, 185-6

is not logical. Their misunderstanding might stem from being restricted to Dejima and unable to access Japanese medical general practices. Regardless, Europeans neither imported these acupuncture needles from China, Japan, or Korea nor mass-produced them until the 19th century. In 19th century, Europeans used neither golden needles nor silver needles, but 3-inch-long steel needles.[151] To facilitate insertion and reduce patient pain, the makers applied a layer of wax to the surface of the needle, which was not found on Chinese or Japanese needles.[152] Additionally, the makers improved the design of the hand-held end using ivory, making it easier for doctors to grip.[153] This design allowed doctors to apply force directly on the needle, thus eliminating the need for an additional small hammer.[154]



[151] Churchill, *A Treatise on Acupuncturation*, 75.
[152] Churchill, *A Treatise on Acupuncturation*, 75.
[153] Churchill, *A Treatise on Acupuncturation*, 79.
[154] Churchill, *A Treatise on Acupuncturation*, 80.

Figure 5 Needle of European design

A summary is that the discussions about acupuncture in Europe were closely linked to the status of anatomy in the medical community at the time. This relationship is twofold: one part involves the relationship between the "anatomy" underlying the acupuncture diagrams from China and Japan and European anatomy, and the other part concerns the similarities between the tools and operations of acupuncture and those of precise surgery. Based on these two points, Europeans maintained a sustained interest in acupuncture. Meanwhile, discussions about moxibustion, which resembled cauterization, were initiated by two religious figures and contained little scientific substance, eventually being forgotten by the times.

CONCLUSION

This thesis unveils a narrative that the spread of acupuncture in early modern Europe was more about the discovery of acupuncture by Europeans, rather than its acceptance. In other words, the initial interest of Europeans in acupuncture was not primarily due to widespread cultural appropriation, but stemmed from medical needs, such as the need to cure gout, and the desire to learn more about anatomy and acquire more precise surgical techniques. I believe the focus of discussions about acupuncture was on anatomy, not the cultures of China and Japan. That is, the technique of acupuncture was incorporated into European discussions about anatomy, suggesting a European scholarly acceptance of acupuncture.

Moxibustion failed to engage in serious medical discussions. Though it garnered more intense attention than acupuncture, the interest in it was fleeting. This disparity highlights the broader theme of my dissertation: the different trajectories of scientific and cultural acceptance. Scientific acceptance does not require an endorsement of correctness, only the initiation of discussion, while cultural acceptance or social recognition requires a positive attitude. In scientific discussions, people can mention acupuncture without endorsing it, and this still demonstrates that acupuncture was accepted.

The findings of this paper also compel me to reconsider the traditional narrative that views science as a European export. This narrative interprets early modern scientific exchanges as a form of scientific colonisation. However, this study shifts the focus of scientific exchange from geographic-cultural conflicts to the exploration of scientific issues. This shift shows that the differences within the European scientific community are not smaller than those between Europe and other regions. That is to say, global science might need to reconsider its division

based on race and region, and rethink whether the establishment of scientific consensus, methodologies, and educational organisations are prerequisites for the dissemination of science.

This thesis regrettably did not explore the role of religious ideas in the transmission of acupuncture, a topic that represents a promising direction for future research. Indeed, there is a wealth of material on this subject, but I struggled to find a narrative approach to address it.

Firstly, the thesis completely omits the role of Daoist ideas in Chinese medicine and Buddhist ideas in Kampo medicine in the transmission of acupuncture. The reason for this omission is that I could not find an angle from which to narrate their influence. These ideas were also not presented based on cultural relativism: they were neither introduced in a comprehensive and systematic way nor subjected to dismissive misunderstandings or criticisms.

Secondly, since moxibustion is similar to cauterisation techniques, and these techniques bear a resemblance to witchcraft, the discussions about moxibustion touched on some religiously infused topics. These discussions are intertwined with Paracelsian discourse, making them both fascinating and complex. Unfortunately, I was unsure how to organise this material effectively.

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APPENDIX

The prompt for Latin to English translation

Below is the prompt for the Latin-to-English translation I used for this thesis. The underlining parts are changeable for other translations.

You are an expert in the history of medicine, and philology, especially familiar with the context of early modern Europe. Now you are working on some Latin text. You task is to translate those texts into English.

When you get the text, please first identify if it is from OCR. if yes, please correct the spelling errors first. Please return a three-column table and ask for confirmation, the first column for the sequence number, the second for the original text, and the third for your correction. Ask me for confirmation, and return the corrected text and ask if you need to continue.

If continue, please exam if there is any terms you cannot understand and need explanation. If yes, ask for explanations before translation. If yes, start translation.

Please do the literal translation from the corrected text to English and make sure every word is translated.

And then based on the literal translation, polish the text into American English, Academic style.

Return both literal translation and the polished text.

I will give you the text paragraph by paragraph from next prompt. Just replay Okay for this one.

A GPT

One can also find prompted GPT agent in GPT store named “Medical and Botanical Latin”. I train this GPT agent with the same prompt above and also many materials in early modern medicine. This GPT will keep updating.