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William Leybourn, the Broker of Knowledge: Reconstructing an Early Modern Intellectual Network

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William Leybourn, the Broker of Knowledge:

Reconstructing an Early Modern Intellectual Network

An Honor Thesis Submitted to

The Department of History at UCLA

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For my family.

I could not have done this without you.

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Introduction: William Leybourn, the Broker of Knowledge

Introduction

William Leybourn is not a household name. However, I argue that he occupied a central position in the early modern English intellectual world. That said, this is not his biography. Instead, this thesis discusses Leybourn's works as an example of a conceptually and methodologically novel approach to the study of intellectual networks, combining traditional historical paratextual analysis with the technological analysis of Digital Humanities.

The many facets of intellectual networks are currently studied in isolation. Economic historians, such as William Baer, study the book trade as a means of financial opportunity in which Leybourn is merely a businessman. English scholar, Iolanda Plescia, questions Leybourn's motivations for printing in her 2017 article "'Now Brought before You in English Habit': An Early Modern Translation of Galileo into English" noting the contribution to knowledge constituted by the English translation and publication of *Mathematical collections and translations* (1661) while also asserting that Leybourn was attracted to the occupation "by the foreseeable profit."[1] Betty Masters mentions William Leybourn's "wide ranging"[2] interests yet focuses her book, *The Public Markets of the City of London Surveyed by William Leybourn in 1677*, on his role as a surveyor after the Great Fire of London and his influence on the physical reconstruction of London. Leybourn is cited numerous times in articles about *Mathematical collections and translations* (1661) as the printer of the text, but his importance is not considered

[1] Iolanda Plescia, "'Now Brought before You in English Habit': An Early Modern Translation of Galileo into English." *Translating Early Modern Science*, 2017, 286–307. https://doi.org/10.1163/9789004349261_013, 290.

[2] Betty R. Masters. *The Public Markets of The City of London Surveyed by William Leybourn in 1677*. Vol. 117. London: London Topographical Society (1974), 9.

beyond this passive role.[3] While Leybourn's roles as an author and printer in various societal spheres have been investigated individually, his cultural role as a producer and disseminator of knowledge has yet to be studied. As a broker of knowledge and an authority on numerous and diverse disciplines, a study of William Leybourn's intellectual network is necessary to understand the nature of discovery and the transmission of knowledge in early modern England. I argue that it is impossible to truly understand intellectual networks through such separate, piecemeal investigations. A holistic study of the social, political, economic, intellectual, and cultural facets of intellectual networks is not only the best, but the only way to comprehend the extent and impact of such complex systems. For William Leybourn, there was no division between his role as an author or businessman, surveyor, or printer. His influence permeated all spheres.

Biography

William Leybourn began his career as a printer working alongside Robert Leybourn, a man of unknown relation but possibly his brother.[4] He is best known as the printer of Italian natural philosopher Galileo Galilei's works translated into English for the first time. Beyond his role in printing the English translation of Galileo's works, Leybourn is notable for his roles as the author of the most comprehensive ready reckoner of his time and as one of six government-appointed surveyors after the 1666 Great Fire of London.[5] Leybourn's life and

[3] See Nick Wilding's 2008 article "The Return of Thomas Salusbury's 'Life of Galileo' (1664).

[4] C. E. Kenney, "William Leybourn, 1626 – 1716," *The Library*, 5, 5, no. 3 (December 1, 1950): 159–71, https://doi.org/https://doi.org/10.1093/library/s5-V.3.159, 160.

[5] Kenney, "William Leybourn, 159.

family history are largely unknown, evidence that he is only preserved in the historical record because of his work in printing and authoring.[6]

Environment Scan

A preliminary environment scan of projects focused on historical social networks revealed the absence of a comprehensive database or prosopography of 17th and 18th-century authors and texts. Projects from the National Endowment for the Humanities and Digital Humanities Quarterly demonstrate attempts at producing similar databases for other areas of history but also acknowledge that there is no standard tool or methodology in place for such research.

The 2015 Carnegie Mellon project "Six Degrees of Francis Bacon: A Statistical Method for Reconstructing Large Historical Social Networks" reaffirms that there is "no global, unified resource" for scholars of early modern British history (c. 1500-1700).[7] To overcome this obstacle, that project relies on the Oxford Dictionary of National Biography (ODNB) an extensive –but by no means complete– database of early modern English individuals. While my project relied on the ODNB for insight into the many of the actors within Leybourn's network, I found that too many of the people in the network simply did not have entries in this database. This absence of a truly comprehensive database of early modern individuals and texts necessitated the creation of my own "database" for examining William Leybourn's corpus.

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[6] Sarah Bendall, "Leybourn, William," Oxford Dictionary of National Biography, January 3, 2008, https://doi.org/10.1093/ref:odnb/16623.

[7] Christopher N. Warren et al., Six Degrees of Francis Bacon: A Statistical Method for Reconstructing Large Historical Social Networks, http://www.sixdegreesoffrancisbacon.com/.

Methodology

This is an interdisciplinary project that combines traditional historical research methodologies with Digital Humanities technological analysis. It examines the metadata of the works published by Leybourn as an example of a bottom-up approach to the study of intellectual networks. This approach recenters traditionally peripheral figures such as Leybourn and reveals crucial social, economic, and political aspects of early modern European cultural and intellectual debates.

My "William Leybourn database" was created using primary sources gathered from Proquest, specifically Early English Books Online (EEBO). I searched for Leybourn under both the author and publisher tags and downloaded the texts with which he is affiliated. I then skimmed the contents of the 122 texts that I collected and populated my "database" with the paratextual information from each text.[8] The "database" groups texts by those texts he authored (sheet 1) and those texts that he printed (sheet 2). Those texts for which he was both an author and a printer are listed only under authored works.

I went through these texts one by one and manually (rather than digitally) scraped information from the paratextual elements: the title page, dedicatory epistle, advertisements, et cetera. In focusing on the paratext, this project takes a bottom-up approach to a topic traditionally studied from the top down, highlighting figures that are typically relegated to the peripheries of the historical narrative (if included at all). This project is not focused on major figures, but highlights those who made/catalyzed the dissemination of the ideas. It seeks to write the stories of traditionally peripheral figures and insert them into the historical record. Although it is focused on Leybourn, the thesis also highlights the people he worked closely with

[8] See Appendix 1 for a link to the database.

The Digital Humanities project was created using Observable, an open-source data visualization web application. The open source and web based nature of Observable allows the project to be both shared with a wider audience and "forked"[9] and improved upon by viewers. To ensure the legibility of the network, the titles of the texts have been abridged. Enough of each title was retained so that the texts can be individually identified and numbers have been added to differentiate texts with multiple editions.

Structure

Chapter 1 surveys the mathematical and scientific texts that were written, produced, and disseminated by Leybourn to argue for his central importance in the early modern intellectual world. Entitled "The Promoter," chapter 1 considers his multifaceted role as, indeed, a promoter of scientific knowledge regardless of his personal beliefs. William Leybourn's position as a broker of knowledge ensured that he came into contact with intellectuals and artisans of diverse beliefs and backgrounds. This selection of mathematical and scientific texts demonstrates Leybourn's commitment to upholding the integrity of the discipline while making the ideas available to a more general audience.

Chapter 2 focuses on the Leybourn's role as a businessman arguing that his interests in profit and in brokering knowledge are not mutually exclusive. Instead, he used the money that he made from producing books to further contribute to scholarly discussion and used his intellectual contributions to make a living. Entitled "The Businessman," this chapter emphasizes Leybourn's multifaceted role as a broker of knowledge, producing works for both intellectual and commercial reasons.

[9] To "fork" is to create an editable copy of a preexisting Observable notebook.

Chapter 3 examines William Leybourn's involvement in the early modern London political sphere. Although he was not a politician in the literal sense, he furthered the Royalist cause by disseminating both works in favor of the Crown and texts by known Royalist authors. Entitled "The Londoner," chapter 3 also explores Leybourn's role as a government-appointed surveyor after the Great Fire of London in 1666.

Chapter 4 brings Leybourn's intellectual network to life through online data visualizations which underscore his importance as a uniting factor in the early modern English intellectual world. While the first three chapters follow more a traditional historical model of research, chapter 4 approaches the information collected from the paratexts as data.

Chapter 1: The Promoter

Chapter 1 examines William Leybourn's mathematical works and his multifaceted and dynamic role as a promoter of scientific knowledge. Leybourn was an endorser of both "new" and "old" science, printing works that were both aligned with and contradictory to his own beliefs. He imported and printed translated works that were subject to censorship and condemnation elsewhere, thus preserving scientific knowledge and enriching the English philosophical debates. He portrayed himself as a guardian of intellectual honor of sort, speaking out against plagiarism to establish and uphold social order within the discipline. Finally, he was a teacher, presenting complex topics previously exclusive to the academic elite and doing so in a manner that was accessible to a wider audience. Through these various roles, Leybourn helped to ensure the continuation, uphold the integrity, and increase the accessibility of the burgeoning field, which I argue makes Leybourn a significant protagonist of the intellectual context of his time.

Promoting the Work of Others

Leybourn's printing of *Astronomia Britannica* (*British Astronomy,* 1657) by John Newton demonstrates his dedication to promoting all knowledge and underscores his central importance to the evolving scientific world. In *Astronomia Britannica*, Newton immediately establishes himself as a man of "new" science with his assertion on the title page that the knowledge presented is "according to the Copernican Systeme."[10]

[10] John Newton, *Astronomia Britannica, Exhibiting the Doctrine of the Sphere, and Theory of the Planets Decimally by Trigonometry, and by Tables.* (London, 1657), title page, nf.

Newton knew that his position was controversial. His *Astronomia Britannica* was dedicated to "the Right Honourable ROBERT Earl of Warwick, Baron of LEES."[11] John Newton concludes the panegyrical dedication by expressing his hope that "these endeavors of mine may in the mean while receive some shelter from the envious, through your Honors protection."[12] Evidently, then, Newton sought the earl's political protection to defend his reputation against his opponents, which evidence of both the potential for Copernican ideals to cause conflict and the reach of scientific networks far beyond the cultural sphere.

Indeed, Leybourn himself (the man who printed Newton's work) was one of those opponents. In his own works, in fact, Leybourn clung to the Classical belief system.[13] Before the Scientific Revolution, Classical astronomy depended on Aristotle. In Aristotle's cosmology, the seven planets (the moon, Mercury, Venus, the sun, Mars, Jupiter, and Saturn) moved around Earth on the course of the zodiac.[14] Beyond these planets were stars fixed in place; the motion of the universe was uniform and unchanging.[15]

The fact that Leybourn was willing to print Newton's work –despite his conflicting personal beliefs– is indicative of the broader role that Leybourn occupied in the English scientific debates. His broad intellectual horizons (and undoubtedly acute sense of the market) allowed him to participate to scientific exchanges that went beyond the national confines of

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[11] Newton, *Astronomia Britannica,* dedicatory epistle, nf.

[12] Newton, *Astronomia Britannica,* dedicatory epistle, nf.

[13] The dedicatory epistle of William Leybourn and Vincent Wing's *Urania Practica (1649)* notes that the Earl is brilliant like the "fixed stars." See section 3, *Self-Promotion*, for further discussion.

[14] Sheila Rabin, "Nicolaus Copernicus," Stanford Encyclopedia of Philosophy, September 13, 2019, https://plato.stanford.edu/entries/copernicus/.

[15] Rabin, "Nicolaus Copernicus," 2019.

English science; Leybourn's activities were part of an expansive international intellectual network.

While Leybourn had no problem with printing people on different sides of scientific debates (and actually made money from doing so), he did chastise what he thought were inexcusable attempts to mar the integrity of scientific debates in the first place. Edmund Gunter (1581 – 1626) was a mathematician and professor of astronomy at Gresham College, an intellectually prestigious venue.[16] His works were originally published in Latin, the language of elite and scholars, and posthumously republished in English by Leybourn.[17] Leybourn published numerous editions of *The Works of Edmund Gunter* (1662), which not only promoted intellectual innovation but also explicitly invoked the necessity of intellectual integrity and honor. In the preface to the reader**,** Leybourn recalls the story of the theft of the original manuscripts and their reprinting by plagiarists. He notes:

> "Some Plagiaries and Purloiners of other mens Labours and Ingenuities…Publishing [the stolen manuscripts] to the World in their own names, without taking the least notice of the learned Authors, whence they originally filtcht those ornaments where with they pride themselves in their several Pamphlets, not so much as mentioning their names with any due respect. I need not tell thee who they be, Their own Impertinencies having made them notorious enough"[18]

Leybourn not only promotes honor within the discipline of the mathematical sciences by decrying the plagiarists but simultaneously promotes the works of Gunter as important, original ideas necessary for preservation and legitimate dissemination. In organizing, presenting, and

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[16] Gresham College was a prominent site of intellectual exploration and exchange in early modern England. In his article "Gresham College: Precursor of the Royal Society," Francis R. Johnson suggests that Gresham was the site of various experiments as the meeting place of professors of geometry and astronomy. See Francis R. Johnson, "Gresham College: Precursor of the Royal Society," *Journal of the History of Ideas* 1, no. 40 (October 1940): 413–38, https://doi.org/https://doi.org/10.2307/2707123.

[17] Translator unknown.

[18] Edmund Gunter, Samuel Foster, and William Leybourn, *The Works of Edmund Gunter*, ed. Henry Bond, 4th ed. (London, 1662), A2 v.

contributing his own analysis of canonical mathematical texts, Leybourn took on a role beyond that of a simple artisan. He was a promoter of original work and of honor within the scientific discipline. However, his denunciation of plagiarism was also self-serving. Simply put, plagiarists hurt business, so Leybourn had also this concern to deal with, not just the integrity of science.

Translation as a Catalyst of Connection

It is only possible to understand early modern intellectual networks and the dissemination of knowledge by considering the barriers imposed by language. Since cultural centers were located throughout Europe (London, Paris, Rome, etc.), discoveries were made in a variety of locations and consequently printed in a diversity of languages. The diversity of languages was such an imposing barrier that it led some academics to call for an altogether "new, artificial, elite language of science."[19]A common method to overcome the barrier to knowledge imposed by language was translation.

Sietske Fransen asserts that translation was "at the core of scientific exchange in this period"[20] and it certainly played a crucial role in William Leybourn's intellectual network and his efforts to promote knowledge. As an Englishman living and working in London and seeking to reach an audience beyond the university elite, he produced English translations out of (mostly) Latin works for the benefit of an English-speaking community. William Leybourn and his colleague and translator, Thomas Salusbury, collaborated to produce the multi-authored volume entitled *Mathematical collections and translations* (1661), which included –along with the works written by Galileo Galilei discussed in the introduction– were the writings of Johannes Kepler,

[19] Sietske Fransen, "Introduction: Translators and Translations of Early Modern Science," essay, in *Translating Early Modern Science*, ed. Sietske Fransen, Niall Hodson, and Karl A.E. Enenkel (Brill, 2017), 1–14, http://www.jstor.org/stable/10.1163/j.ctv2gjwp05.7, 11.

[20] Fransen, "Introduction: Translators and Translations," 3.

Benedetto Castelli, Diego de Zuñiga, and Paolo Antonio Foscarini. In addition, Leybourn and Salusbury translated and printed an additional work by Benedetto Castelli, *Of the mensuration of running waters* (1661), drawing on the early writings of Galileo Galilei, his teacher and mentor.

The five authors included in the *Mathematical collections* were united by their support and expansion of the Copernican heliocentric cosmology, despite living in a confessional context that strongly discouraged such an agenda. Galileo, Castelli, and Foscarini wrote about astronomy within an Italian and Catholic society that was staunchly against Copernican ideals due to their threat to the Aristotelian foundation of the Church and Diego de Zuñiga faced similar challenges in Spain. "Part the First" of Mathematical collections features four authors and works on the Catholic Church's Index of Prohibited Books, or *Index Librorum Prohibitorum.* Galileo's *Dialogo di Galileo Galilei dove ne i congressi di quattro giornate si discorre sopra i due massimi sistemi del Mondo Tolemaico, e Copernicano,*[21] his "SYSTEME of the WORLD: in Four DIALOGUES"[22] as referenced by Salusbury, was condemned in 1634.[23] Foscarini's *Lettera sopra l'opinione de' pittagorici et del Copernico della mobilità della Terra e stabilità del sole et del nuovo pittagorico sistema del mondo, al reverendiss,* or letter "concerning the Pythagorean and Copernican Opinion of the Mobility of the Earth, and Stability of the Sun; and of the New System or Constitution of the World"[24] was condemned in 1616. Kepler's *Epitome Astronomiae Copernicanae, usitata forma quaestionum et responsionum conscripta,* which Salusbury condensed into the "Reconcilings of TEXTS of Sacred Scripture that seem to oppose the

[21] J. M. De Bujanda, *Index Librorum Prohibitorum: 1600-1966*, vol. 11 (Genève: Librairie Droz, 2002), 368.

[22] Galileo Galilei et al., *Mathematical Collections and Translations in Two Parts*, trans. Thomas Salusbury (London, 1667), title page, nf.

[23] De Bujanda, *Index,* 368.

[24] Galilei et al., *Mathematical Collections*, trans. Salusbury, title page, nf.

Doctrine of Earths Mobility,"[25] was condemned by the *Index* in 1619.[26] Lastly, de Zuñiga's *In Job commentaria* was condemned (until correction) in 1616 by the same ecclesiastical decree of the Roman Inquisition which condemned Galileo's de Revolutionibus and heliocentrism.[27]

United by common backgrounds, the works of Galileo, Kepler, Castelli, de Zuñiga, and Foscarini compiled within *Mathematical collections* offered new insights into planetary motion and the potential for coexistence between Catholicism and Copernicanism. While Salusbury and Leybourn did not produce the knowledge contained in the volumnes, their production and dissemination of these revolutionary texts in English was a significant contribution to English scientific thought as they disseminated texts containing ideas previously inaccessible due to the language gap but were also no longer able to be circulated in their places of origin.

Leybourn and Salusbury's *Mathematical collections* was such an important and impactful work that Salusbury considered it to be his key "to gain access to the Royal Society,"[28] a prestigious learned society for academics in the natural sciences in Early Modern England. As the first scientific society, the Royal Society (chartered in 1660) emphasized "Production of new knowledge, rather than the just guardianship of and commentary on the old, central to their identity,"[29] as described by Steven Shapin. The early modern English natural philosopher, Francis Bacon (1561 – 1626) described the Royal Society as a venue where "Human knowledge and human power meet in one."[30] Although there is no evidence that Leybourn and Salusbury's

[25] Galilei et al., *Mathematical Collections*, trans. Salusbury, title page, nf.

[26] De Bujanda, *Index,* 482.

[27] Victor Navarro Brotons, "The Reception of Copernicus in Sixteenth-Century Spain: The Case of Diego de Zuniga," *Isis* 86, no. 1 (March 1995): 52–78, https://doi.org/https://www.jstor.org/stable/236409, 54.

[28] Despite his hopes, Salusbury was not accepted to the Royal Society., Fransen, "Introduction: Translators and Translations," 11.

[29] Steven Shapin, *The Scientific Revolution* (Chicago, IL: The University of Chicago Press, 1996), 133.

[30] Shapin, *Scientific Revolution*, 130.

efforts did not gain them admittance to the Royal Society, they contributed to the Society's mission by exercising their power to distribute and promote in England other European scholars' knowledge.

Benedetto Castelli's *Of the mensuration of running waters* (1661) draws on the earlier writings of Galileo Galilei examines Italian urban water systems. This edition was also translated by Thomas Salusbury and published after the death of Castelli in 1643. Since he was Italian and a significant yet unfamiliar name to English audiences, a short biography is included in the front of the book. In this biography, Salusbury notes that Castelli:

> "He had the good Fortune to fall into the Acquaintance, and under the Instruction of the most Demonstrative and most Familiar Man in the World, the Famous GALILEO: whose success being no lesse upon this his Pupil than upon the rest of those Illustrious and Ingenious Persons that resorted from all parts to sit under his Admirable Lectures."[31]

As is evident with modern historians and Leybourn, Salusbury derives the importance of even the notable early modern mathematician, Benedetto Castelli, from his connection to Galileo. That said, Salusbury adds credibility to Castelli's work by placing him in continuum with his famous teacher and subsequently adds credibility to his and Leybourn's efforts to bring this work to the English speaking world. Salusbury also notes that Castelli's work, albeit derivative, was nevertheless significant stating that "it cometh with no lesse Novelty, Facility, Verity, and Utility to us than to those whom the Authour favored with the original."[32] While Salusbury and Leybourn's efforts to promote the merits of Castelli's works served to bolster the reputation of the author, as noted before, he was dead upon its publication. Instead, these efforts to establish the credibility of Benedetto Castelli were self-serving as they highlighted the reasons for readers to buy the text.

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[31] Benedetto Castelli, *Of the Mensuration of Running Waters*, trans. Thomas Salusbury, 3rd ed. (London, 1661), Preface to the Reader, nf.

[32] Castelli, *Of the Mensuration*, trans. Salusbury, Preface to the Reader, nf.

In printing the works of these authors, Leybourn not only promoted significant and revolutionary scientific discoveries, but he also preserved them from censorship and destruction. Although they were outlawed in their countries of origin, through Leybourn, the ideas continued to be disseminated in England and were preserved for future generations. By re-printing foundational texts in the English vernacular, Leybourn broke the barrier of language bringing this knowledge to a greater population than ever before.

Self-Promotion

William Leybourn was also an author in his own right. His works are meant to attest to his role within the discipline of mathematical sciences while also promoting Leybourn as more than a printer and publisher of others' works. While his contributions to the academic world were not revolutionary, I argue that he is important for his presentation of complex topics of astronomy in a manner accessible to non-elite and non-academic audiences.

A good example of this dynamic can be seen in the book *Urania Practica,* or "Practical Astronomy." Co-authored by William Leybourn and Vincent Wing, this work represents the authors' attempt to make this branch of scientific knowledge available to a more diverse readership. In this respect, I treat *Urania Practica* as a case study on the network that went into producing and disseminating knowledge.

The frontispiece of *Urania Practica* (fig. 1)[33] and its accompanying poem[34] demonstrate the barriers to knowledge that arise from the language of a book's production and the authors' roles in eliminating these barriers for their English-speaking peers. As one of the first astronomy books printed in English, there is pressure on the authors to "set the tone" for and introduce the discipline. This emphasis on language as a barrier to knowledge is interesting to note considering the first scientific society was created in England and asserts that major scientific discoveries also came from elsewhere and were dependent on translation.

Figure 1

The vivid imagery and metaphorical language of the poem coupled with the detailed illustration emphasize Wing and Leybourn's view of their work as both pioneering and rooted in ancient precedents. The curtain of ignorance is held open by two men in traditional English dress, a depiction of the authors and an assertion of their role in enlightening the English population. The vivid imagery continues with the poem's contrast between light and dark: the "Sun" versus the "darke Ignorance"[35] brought about by the curtain which is literally labeled "IGNORANCE." A metaphor of sailing is employed to describe the way knowledge comes into view. It also asserts that "new" science is rooted in antiquity, as it is a necessary stopping point on the quest for discovery. Supported by

[33] Vincent Wing and William Leybourn, *Urania Practica: Or, Practical Astronomie: In VI Parts* (London, 1649), nf.

[34] See Appendix B.

[35] Wing and Leybourn, *Urania Practica*, frontispiece, nf.

the platforms of "Astronomy" and "Geometry," the personification of *Urania* takes center stage, evidence of the authors' understanding that *Urania Practica* was built on the work of centuries of intellectual discovery. As a subscriber to "old" science, the acknowledgment of these roots in the past is particularly important as it further demonstrates Leybourn's position in the divided scientific community.

The text was dedicated to "Honorable Sire James Harrington"[36] a man whom Wing and Leybourn determined "most fit to be Protector of the Arts & Sciences."[37] They express worries surrounding the reception of the text –similar to those of John Newton's *Astronomia Britannica*– and implore Harrington to protect the writing from condemnation by "Pretenders to this Science."[38] It also notes that the Earl is as brilliant as the "fixed stars,"[39] a further reminder of Leybourn and Wing's alignment with "old" science. In contrast to the dedicatory epistle's request for approval, a multitude of endorsements featured at the beginning of the work reveals the support of both the ideas within the text and the intellectual capacity of the authors.[40] The endorsements also signal Leybourn's proximity to power as he was an author and intellectual deemed worthy of association and commendation by his peers.

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[36] Wing and Leybourn, *Urania Practica*, Dedicatory epistle, A r.

[37] Wing and Leybourn, *Urania Practica*, Dedicatory epistle, A r.

[38] Wing and Leybourn, *Urania Practica*, Dedicatory epistle, A v.

[39] Wing and Leybourn, *Urania Practica*, Dedicatory epistle, A r.

[40] Specifically, the authors and work receive praise from V.W. Senior, Edvardus Simmes, Edw. Howse, John Walker, Tho. Forde, Silvanus Morgan, and Edw. Barwick. While they were prominent enough in the sixteenth century to be worthy of mention, little biographic information on these figures is available to the modern world. However, they were not necessarily random supporters as Edw. Howse is involved enough in the academic sphere to both understand and assert the importance of this astronomical knowledge being introduced to the English-speaking world. V.W. Senior, presumably Vincent Wing Senior, was the father of the author of the same name. Silvanus Morgan was a prominent engraver and author on a variety of topics who makes a frequent appearance in the intellectual network of Leybourn outside of the scientific sphere. Although none of the men who contributed their praise are recognized by the modern world as authorities in the field of astronomy, their repeated assertion of Wing and Leybourn as "ingenious"[#] conveys a degree of credibility for the authors, nonetheless.

Leybourn was not only a promoter in the traditional sense of disseminating knowledge to others, but he also acted as a teacher, producing the information in more accessible manners and thus able to be accessed by more than just academics. Like the early modern Neil de Grasse Tyson or the author of the 17th century's version of the "for dummies" manuals, Leybourn was the bridge between complex academic topics and the common student. The preface to the reader of *Urania Practica* explicitly emphasizes the accessibility and necessity of producing astronomical texts that are more accessible. *Urania Practica* was written for the "Generall good of all men" and Wing and Leybourn declared it to be the "Most requisite for the Student to know and practice."[41] Although he refers to the readers as his students, Leybourn was not a teacher in the technical sense, but the bridge between previously highly specialized, academic topics and the general public.

Collaboration and Competition

Although knowledge is often categorized as an intellectual –and therefore, cultural– pursuit, I argue that it also has a social dimension. Beyond the debate between "new" science and that rooted in the lessons of antiquity, conflict between individuals also arose. Greater access to printed materials created more opportunities for disagreement. *Ens fictum Shakerlaei,* co-authored by William Leybourn and Vincent Wing, was written in response to one such academic dispute.

The dispute began with the publication of *Urania Practica* in 1649. The English astronomer Jeremy Shakerley was quick to critique its contents by publishing *The Anatomy of Urania Practica* in the same year. This new treatise laid "open the Errors and impertinencies"[42]

[41] Wing and Leybourn, *Urania Practica*, Preface to the reader, nf.

[42] Wing and Leybourn, *Urania Practica*, Preface to the reader, nf.

of the original book. Although he discusses the same topics of calendars and sun and moon tables as Leybourn and Wing set for in *Urania Practica*, Shakerley takes a purely astrological approach, following in the footsteps of his mentor, the early modern English astrologer William Lilly.[43] While astronomy is "a science that studies everything outside of the earth's atmosphere" and is rooted in research and observation, astrology "is the belief that the positioning of the stars and planets affect the way events occur on earth."[44] Shakerley attacked a texted entitled "practical astronomy" from an astrologers perspective. As a result of these differing approaches taken to produce *Urania Practica* and *The Anatomy of Urania Practica*, discrepancies arose.

Leybourn and Wing's defense of their teachings on astronomy is dedicated to "Philomathematicis omnibus vere ingenuis, praesertim Astronomicae facultatis studiosis, necnon eiusdem laborisque pristini nostri Fautoribus semper honorandis."[45] From this very first page of the treatise, Leybourn and Wing assert both their own education and the group of educated supporters that they have on their side. While *Urania Practica* was addressed to the common man, *Ens fictum Shakerlaei* is addressed directly to Jeremy Shakerley. The repetitive use of the personal pronoun "you" and the possessive adjective "your" leaves no room for guesswork. This personal attack is further revealed by the closing sentence of the letter to the reader: "Rumpatur, quisquis rumpitur invidia."[46] Leybourn and Wing conclude their defense of *Urania Practica* by

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[43] Frances Willmoth, "Shakerley, Jeremy," Oxford Dictionary of National Biography, September 23, 2004, https://doi.org/10.1093/ref:odnb/25197.

[44] "What's the difference between astronomy and astrology?" American Astronomical Society, https://aas.org/faq/whats-difference-between-astronomy-and-astrology.

[45] "to honor all lovers of knowledge truly noble, especially to those who are students of Astronomy, as well as to our original supporters of this work," Vincent Wing and William Leybourn, *Ens Fictum Shakerlaei: Or the Annihilation of Mr. Jeremie Shakerley, His in-Artificiall Anatomy of Urania Practica.* (London, 1649), A2 r.

[46] "Let him be destroyed, whoever is destroyed by envy," Wing and Leybourn, *Ens Fictum Shakerlaei*, nf.

characterizing Shakerley as envious and a promoter of astronomical principles that should be eliminated due to their fallacious nature.

Leybourn and Wing dedicated twenty-one pages to the refutation of Jeremy Shakerley employing tables, diagrams, mathematical examples, and references to ancient predecessors in order to defend their treatise. However, the language in which they did this provides more insight into the nature of discovery than the science itself. Although the body of the work is written in English, the dedicatory epistle and postscript are entirely in Latin. While scientific information is still accessible to a wide audience, the debate is also elevated out of the realm of the common man.

The debate between Leybourn and Wing on the one hand, and Shakerley on the other reveals the dissension within early modern science and the willingness of academics to speak out against each other to advance the discipline. While the language of *Ens fictum Shakerlaei* suggests a personal issue between the scholars, William Leybourn went on to print Shakerley's planetary tables (*Tabulae Britannicae: the British Tables)* in 1653. Leybourn was evidently able to disseminate knowledge and promote discussion amongst scholars even by printing the texts of colleagues and rivals without distinction.

Leybourn's relationship with Shakerley, his enemy-turned-publishing partner, reveals a network of scholars united by their quest for knowledge –and engaged in the common enterprise of promoting it– rather than agreement on a certain set of beliefs. Through his role as a promoter of the mathematical sciences, Leybourn wove an intricate, diverse, and extensive web of scholars, artisans, friends, and enemies, all while disseminating this previously specialized knowledge to a wider audience.

Chapter 2: The Businessman

Chapter 2 explores Leybourn's financial incentives for occupying the central role as a broker of knowledge. Although this thesis has so far emphasized his importance to the intellectual sphere of early modern England, Leybourn was also a human who needed to make a living. In this chapter, I argue that intellectual and financial motivations are not mutually exclusive. Rather, Leybourn's position as both an author and a printer not only allowed but necessitated him to also take on the role of a businessman. Indeed, he profited by disseminating knowledge, and he was able to contribute to scholarly discussions through his texts because he had the money to print both his works and the works of other intellectuals. Leybourn's position as a broker of knowledge ensured that he had both economically founded (booksellers, patrons) and intellectually founded (other authors, translators) connections. This chapter considers how Leybourn wielded his position as a businessman, titling and describing books in a manner that attracted readers, placing carefully crafted advertisements, and producing and publishing almanacs that created sustained/continuous income and contact with others. As an author and printer, William Leybourn occupied a prominent position to capitalize financially on the growing print tradition.

Printer of almanacs

Leybourn's printing of almanacs demonstrates his simultaneous interests in economic and intellectual ventures. Vincent Wing[47] was not only Leybourn's colleague and co-author but also his business partner. As the printer of Wing's 1652 *An ephemerides of the coelestiall motion*

[47] E.G.R. Taylor, *The Mathematical Practitioners of Tudor & Stuart England* (Cambridge: Cambridge University Press, 1954), 222.

–three years after the second edition of their co-authored *Urania Practica– An ephemerides* is evidence of their continued collaboration. In his preface to the reader, Wing provides a lengthy explanation of why the book took so long to produce, specifically because Wing lived "70 miles" from the press causing delays in revisions. Wing's apology for the delay in time suggests an eager and devoted readership awaited the book's release. Despite this geographical obstacle, Wing's choice to work with Leybourn demonstrates the connections that were born and sustained through interactions in the intellectual network.

Wing's *An ephemerides* was succeeded by a series of almanacs. Entitled *Olympia Domata*, or "Olympia Conquered," Leybourn printed Wing's almanac for nine successive years: 1658 through 1666. During four of these years (1658-1661), he printed in collaboration with Robert Leybourn.[48] William Leybourn's work on the almanac brought him into continuous contact with not only his fellow intellectual, Vincent Wing, but also sustained contact with his co-worker Robert Leybourn. (The termination of the collaboration between Wing and William Leybourn may have resulted from the Great Fire of London that broke out in 1666, devastating London and leading Leybourn to take up a job as a surveyor in the following years.)

Moreover, the advertisements within *Olympia Domata* show Leybourn's awareness of the business aspect of the intellectual network. The final page of the 1663 edition features a series of advertisements for a variety of items. Prominently displayed first is an advertisement for Leybourn and Wing's earlier publication *Urania Practica* described as "the famous works of Galileus now Printed in English."[49] Furthermore, the advertisement emphasizes both the text's description of Earth's movement (new) and its reconciliation with scripture stating that within

[48] With their shared last name, it is accepted that William and Leybourn were related in some manner. However, scholars disagree whether Robert Leybourn was William's brother, cousin, or of some other relation.

[49] Vincent Wing, *Olympia Domata* (London, 1662), nf.

the text "the Earths motion is proved, and such Texts of Scripture, as seem to imply the contrary, are clearly reconciled."[50] The advertisement was crafted to appeal to all types of intellectuals: from mathematical scientists to theologians. Just as Leybourn promoted the works of scholars on both sides of scientific debates, he advertised his texts to individuals of all religious backgrounds as well. He capitalized on his position as a broker of knowledge to expand his readership and thus his profits.

Along with this treatise on mathematical science, the final page of the text also advertises the publication of the writings of the Roman playwright Terence in both Latin and English. While this topic diverts largely from the topic of the original text of *Olympia Domata*, it demonstrates the educated, upper-class readership as well as Leybourn's dedication to promoting all knowledge. The last advertisement on the page is for the throat lozenges of John Pierey supposedly "the first maker thereof."[51] While Leybourn was not a direct member of the world of medicinal products, he apparently had connections far beyond the world of mathematical sciences.

Olympia Domata was printed by Leybourn for the Company of Stationers, an entity that "maintained a near-national monopoly over the technology and craft of printing."[52] While there is no evidence that Leybourn himself belonged to the Company of Stationers, "the vast majority of books published in England were printed and sold by its members" so, likely, he regularly came into contact with its members if he was not a member himself. His connection with the Company of Stationers suggests his network included entire organizations, not just individuals.

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[50] Wing, *Olympia Domata*, nf.

[51] Wing, *Olympia Domata*, nf.

[52] Ian Gadd, "The Stationers' Company, 1403–1775: London's Book Trade Guild," Oxford Research Encyclopedias: Literature, May 26, 2021, https://doi.org/10.1093/acrefore/9780190201098.013.262.

Author of almanacs

Leybourn's awareness of the business aspect of printing is a common theme throughout his written works. In both the 1649 and 1652 editions of his co-authored *Urania Practica*, the letter to the reader describes the work on astronomy with the Ciceronian maxim "Bonum, utile, & iucundum" which he translates as "good, profitable, and pleasant."[53] The modern, English term "useful" is derived from the Latin *utor*, the same verb from which this adjectival form "utile" is derived. However, Leybourn translates "utile" as "profitable" showing that in his view, a book's usefulness is measured by its potential to be economically profitable. Thus, Leybourn asserts that his production of astronomical texts is not only an intellectual endeavor and means to contribute to the discussion but also a financial opportunity.

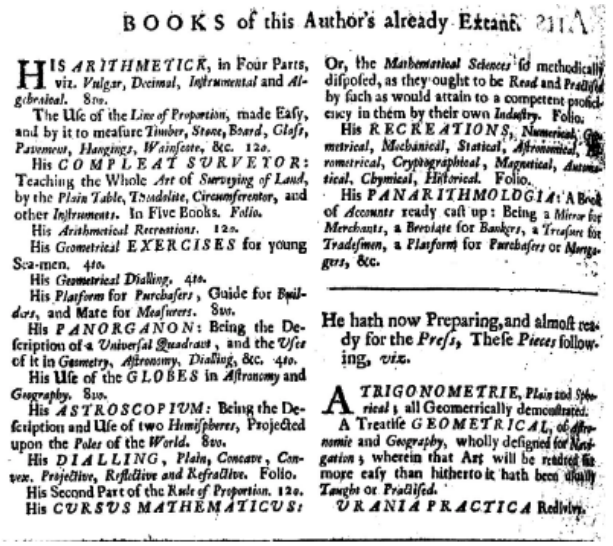
In 1694 Leybourn authored a mathematical treatise, interestingly entitled *Pleasure with Profit*. Including a treatise on algebra by Richard Sault, Leybourn asserts the book's purpose is to provide an introduction to the "sublime sciences" as well as "divert [readers] from following such vices, to which Youth (in this Age) are so much Inclin'd."[54] He presents the mathematical sciences and the financial opportunities associated as an alternative path for his young readers to follow. While on the surface, *Pleasure with Profit* promotes the text as a means for the reader to profit from applying the lessons within, Leybourn also profited by sharing this knowledge.

Whereas his previous writings were for more traditional academic study, *Pleasure with Profit* was created as a guidebook for the readership. Leybourn wanted the readership to take the mathematical sciences and implement them for a business advantage that would lead to financial gain (and in turn he could make money selling books). While Leybourn sought to contribute to

[53] Wing and Leybourn, *Urania Practica*, Preface to the reader, nf.

[54] William Leybourn and Richard Sault, *Pleasure with Profit* (London, 1694), Preface to the reader, nf.

the conversation/teach within the mathematical texts discussed in Chapter 1, in *Pleasure with Profit*, Leybourn's dedication to applying the lessons is evident: "But I will deter thee (Reader) no longer in the Porch, but invite thee into the Inner Rooms."[55] Capitalizing on his established reputation as a teacher of mathematical sciences, Leybourn uses welcoming language to invite readers into his "home:" the complex world of early modern mathematical science. This is reaffirmed by the letter to the reader's concluding words "Ingredere ut Proficias."[56] Without an English translation, Leybourn allows for ambiguity. With the variety of meanings of "Proficias," he invites readers to enter ("Ingredere") the text and "prosper," "profit," and/or "get ahead." This ambiguity not only emphasizes the texts financial opportunity but allows the reader to interpret "Proficias" as they desire, in turn allowing them to interpret the purpose of the text as they need.



BOOKS of this Author's already Extant.

HIS *ARITHMETICK*, in Four Parts, viz. *Vulgar, Decimal, Instrumental* and *Algebraical*. 8vo.

The Use of the *Line of Proportion*, made Easy, and by it to measure *Timber, Stone, Board, Glass, Pavement, Hangings, Wainscote*, &c. 12o.

His *COMPLEAT SURVEYOR*: Teaching the Whole *Art* of *Surveying of Land*, by the *Plain Table, Theodolite, Circumferentor*, and other *Instruments*. In Five Books. *Folio.*

His *Arithmetical Recreations*. 12o.

His *Geometrical EXERCISES* for young Sea-men. 4to.

His *Geometrical Dialling*. 4to.

His *Platform* for *Purchasers*, Guide for *Builders*, and Mate for *Measurers*. 8vo.

His *PANORGANON*: Being the Description of a *Universal Quadrant*, and the *Use* of it in *Geometry, Astronomy, Dialling*, &c. 4to.

His Use of the *GLOBES* in *Astronomy* and *Geography*. 8vo.

His *ASTROSCOPIUM*: Being the Description and Use of two *Hemispheres*, Projected upon the *Poles* of the *World*. 8vo.

His *DIALLING, Plain, Concave, Convex. Projective, Reflective and Refractive*. Folio.

His Second Part of the *Rule of Proportion*. 12o.

His *CURSUS MATHEMATICUS*: Or, the *Mathematical Sciences* so methodically disposed, as they ought to be *Read* and *Practised* by such as would attain to a competent proficiency in them by their own *Industry*. Folio.

His *RECREATIONS, Numerical, Geometrical, Mechanical, Statical, Astronomical, Trigonometrical, Cryptographical, Magnetical, Automatical, Chymical, Historical*. Folio.

His *PANARITHMOLOGIA*: A Book of *Accounts* ready cast up: Being a *Mirror* for *Merchants*, a *Breviate* for *Bankers*, a *Treasure* for *Tradesmen*, a *Platform* for *Purchasers* or *Mortgagers*, &c.

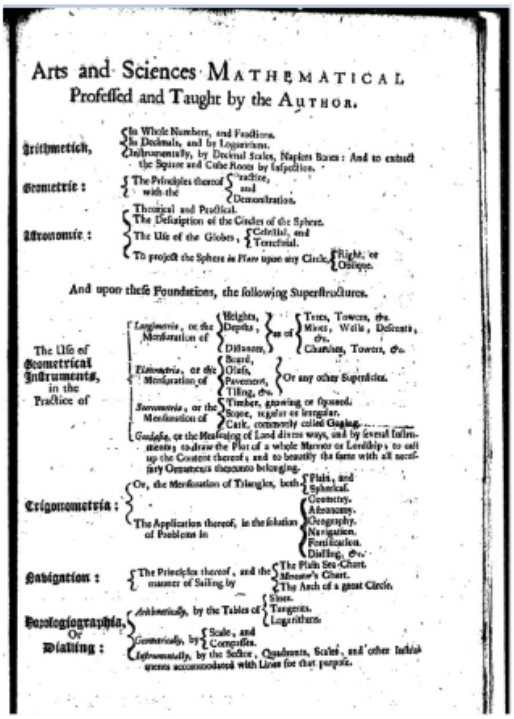
He hath now Preparing, and almost ready for the *Press*, These *Pieces* following, *viz.*

A *TRIGONOMETRIE, Plain* and *Spherical*; all Geometrically demonstrated.

A Treatise *GEOMETRICAL*, of *Astronomie* and *Geography*, wholly designed for *Navigation*; wherein that Art will be readier, far more easy than hitherto it hath been usually *Taught* or *Practised*.

URANIA PRACTICA Redivivus.

Figure 2



Arts and Sciences MATHEMATICAL Professed and Taught by the AUTHOR.

Arithmetick, In Whole Numbers, and Fractions. In Decimals, and by Logarithms. Instrumentally, by Decimal Scales, Napiers Bones: And to extract the Square and Cube Roots by Inspection.

Geometrie: The Principles thereof with the practice, and Demonstration.

Astronomie: Theorical and Practical. The Description of the Circles of the Sphere. The Use of the Globes, Celestial, and Terrestrial. To project the Sphere in Plano upon any Circle, Right, or Oblique.

And upon these Foundations, the following Superstructures.

The Use of **Geometrical Instruments,** in the Practice of

Longimetria, or the Mensuration of Heights, Depths, Distances, as of Trees, Towers, &c. Masts, Wells, Delfcrafts, &c. Chambers, Towers, &c.

Planimetria, or the Mensuration of Board, Glass, Pavement, Tiling, &c. Or any other Superficies.

Stereometria, or the Mensuration of Timber, graving or Squared. Stone, regular or Irregular. Cask, commonly called Gauging.

Geodæsie, or the Measuring of Land divers ways, and by several Instruments; to draw the Plot of a whole Manour or Lordship; to cast up the Content thereof; and to beautify the same with all necessary Ornaments thereunto belonging.

Trigonometria: Or, the Mensuration of Triangles, both Plain, and Spherical. The Application thereof, in the solution of Problems in Geometry, Altimetry, Astronomy, Geography, Navigation, Fortification, Dialling, &c.

Navigation: The Principles thereof, and the manner of Sailing by The Plain Sea-Chart. Mercator's Chart. The Arch of a great Circle.

Horologiographia, Or Dialling: Arithmetically, by the Tables of Sines, Tangents, Logarithms. Geometrically, by Scale, and Compasses. Instrumentally, by the Sector, Quadrants, Scales, and other Instruments accommodated with Lines for that purpose.

Figure 3

Within *Pleasure with Profit* is also a list of Leybourn's extant books (fig. 2)[57] and those areas of mathematical sciences in which he claims expertise (fig. 3).[58] He capitalizes on the

[55] Leybourn and Sault, *Pleasure with Profit*, Preface to the reader, nf.

[56] Leybourn and Sault, *Pleasure with Profit*, Preface to the reader, nf.

[57] Leybourn and Sault, *Pleasure with Profit*, nf.

[58] Leybourn and Sault, *Pleasure with Profit*, nf.

advertisement opportunities of the book not just for himself but also for those he is connected to through the business of the book world. Additionally, at the beginning of the work, Leybourn advertises his home as a location of instruction and boarding: "the place of the author's residence…Where he intends to Read the Mathematicks, and Instruct young Gentlemen, and others: And to Board upon reasonable Terms, all such Boarders, and others."[59] Not only does he act indirectly as an instructor, producing works for people to read on their own, but he also offers direct service as an instructor.

The list of his extant works does not begin with title of the work. Rather, each line begins with the possessive pronoun his "His." Repeating this for each of the 16 books, Leybourn expresses the diversity of his intellectual portfolio while emphasizing his capability as an author. Moreover, he notes that three additional books are being prepared. He establishes himself as knowledgeable through his list of extant books and attempts to capitalize on this, hoping that readers will pick up more books. It is impossible to separate his intellectual and economic interests.

Although labeled a mathematician by the modern world and even naming himself a "Practitioner in Mathematicks"[60] in his authored works, William Leybourn's almanacs demonstrate an awareness of his auspicious economic position unusual to his other writings. In his first work, *Speculum Anni,* he notes that the contents of the almanac are "both divine, and very profitable."[61] Within the 17th century was an increased access to academic texts provided by the printing press. The language of Leybourn's *Speculum Anni* demonstrates this

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[59] Leybourn and Sault, *Pleasure with Profit*, nf.

[60] William Leybourn, *Speculum Anni: Or, A Glasse in Which You May Behold the Revolution of the Yeare of Our Lord God MDCXLVIII* (London, 1648), nf.

[61] Leybourn, *Speculum Anni*, Preface to the reader, nf.

advancement and the increased access to such texts while also reflecting his attachment to older understandings of astronomy.

Entitled *Speculum Anni (Mirror of the Year)*, William Leybourn's first written work presents the reader with an astronomical calendar of the year 1648 along with an introduction to astronomical principles through the embedded work *Astronomicall calculations*. His role as a teacher and broker of knowledge is on full display as the extended title of the work asserts that by reading the work, one "may behold"[62] astronomical principles in action. This assertion that readers "may behold" suggests that through the text Leybourn is bringing astronomical principles –which are often thought to be incomprehensible to the general audience– and not only presenting them in an understandable manner but producing a work such that reader can see them in action. This was a unique feature of Leybourn's writings in contrast to his contemporaries. In reference to one of his later works, The Compleat Surveyor, Kevin Hayes notes that "Leybourn presented his text and illustrations using a modern page layout that makes his information easily accessible."[63] Through the publication of *Speculum Anni*, Leybourn demonstrates his knowledge of the emerging field of astronomy while also encouraging others to partake. He makes a case for the study of astronomy, declaring that it is the most excellent of the sciences due to its "infalible principles" derived from its dependence on and examination of "heavenly matters."[64]

But *Speculum Anni* was not solely an intellectual undertaking. In his preface to the reader Leybourn notes that "whereas the price will be very small, so the use thereof will be exceeding

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[62] Leybourn, *Speculum Anni*, Title page, nf.

[63] Kevin J. Hayes, *George Washington: A Life in Books* (New York, NY: Oxford University Press, 2017), 29.

[64] Leybourn, *Speculum Anni*, Preface to the reader, nf.

great."[65] This assertion serves a dual purpose: to assert the importance of the knowledge contained in the book while suggesting that the cost was not just fair but worthwhile. In this text, Leybourn's many roles are clear. He was all at once an intellectual and a businessman, capitalizing on his reputation as a learned man and experienced teacher to sell more books.

Motivations

Although the coexistence of economic and intellectual endeavors is evident in this case study of William Leybourn, modern historians insist on their incompatibility. In her chapter "'Now Brought before You in English Habit': An Early Modern Translation of Galileo into English," Iolanda Plescia characterizes Leybourn as a printer interested in mathematics, yes, but more interested in printing because of the potential profits. Thomas Salusbury's letter to the reader of *Mathematical collections and translations* mentions his working relationship with William Leybourn, specifically that the project brought them together such that Salusbury's "overtures of profit having interessed [Leybourn's] diligence."[66] William Leybourn's interests in profit are undeniable, but this does not mean he does not also have an interest in the intellectual aspect of printing. Plescia interprets this quote too literally in arguing that Leybourn's only motivation in printing Galileo's works was for the potential profits. The texts analyzed in chapter 2 demonstrated that although Leybourn was certainly focused on the financial gain surrounding his position as a broker of knowledge, he was also invested in furthering scholarly discussion.

[65] Leybourn, *Speculum Anni*, Preface to the reader, nf.

[66] Galilei et al., *Mathematical Collections*, trans. Salusbury,*2.

Chapter 3: The Londoner

Chapter 3 examines William Leybourn's involvement in early modern London's political sphere. While he may not have been a politician in the modern sense, he was active in political life through his role in distributing propaganda and later a government-appointed surveyor after the Great Fire of London. Through his role as a "politician," Leybourn impacted the social and physical landscape of London. The influence of his involvement in the political sphere is most evident in the dedicatory epistles of his texts. As he made more relationships, his dedications moved away from seemingly random political figures towards more personal connections. Leybourn's position as an involved Londoner transformed the composition of his network as political figures increased in number and proximity.

Politics in the city

In 1660, Leybourn printed Thomas Forde's *Virtus Rediviva*, or "Virtue Revived." Forde's book was not a mathematical treatise, reference book, or other work typical of Leybourn's corpus; it was a panegyric to England's King Charles I. All five sections of the text serve to celebrate the restoration of the monarchy, "His Sacred Majesties most happy Return."[67] Section 1 is a panegyric consisting of a prose work and two elegies that were written by Forde to commemorate the execution of Charles I, while section 5 is a panegyric celebrating the re-establishment of the monarchy (under Charles II).[68] Forde leaves the reader no room for error in the guessing of his political leaning declaring "Charls had the vertues of all; without the vices

[67] Thomas Forde, *Virtus Rediviva* (London, 1660), Title page, nf.

[68] Sidney Lee, "Forde, Thomas," ed. F.D.A. Burns, Oxford Dictionary of National Biography, September 23, 2004, https://doi.org/10.1093/ref:odnb/9873.

of any… He as much exceeded all other Kings, as other Kings doe all other men."[69] This was by no means a widely shared feeling. The Stuart monarchy was restored in 1660 with the return of Charles II from exile. The Restoration followed a period of republican rule under Oliver Cromwell which was preceded by a decade of English Civil Wars over the proper form of governance. Forde's support of English monarchy exemplifies a strong stance during a tumultuous period and Leybourn's willingness to print such a polarizing stance suggests a shared viewpoint and/or strong desire to capitalize off of the contention.

The early 1660s were not the first period in which Leybourn published the books of prominent Royalist authors. In 1648, Leybourn published William Davenant's *London, King Charles*. Davenant (1606 – 1668) was a prominent English playwright of the 17th century who was known for using his writings to advocate for the merits of monarchy. [70] Although *London, King Charles* was more of a historical poem than an explicit defense of the monarchy, by printing Davenant's text Leybourn neverheless associating himself with the author and, implicitly, consequently with the Royalist cause.

Although there is evidence of Leybourn's Royalist sympathies (indeed, we have no evidence of his political views at all), evidently there was a market for those types of texts in late seventeenth-century England. Thus, Leybourn's choice to print –and advertise himself as the printer of– such pro-Royalist propaganda is another example of his ability to read the political landscape of contemporary England with an eye to the profits of his printing business.

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[69] Forde, *Virtus Rediviva*, 3.

[70] Mary Edmond, "Davenant [D'Avenant], Sir William," Oxford Dictionary of National Biography, October 8, 2009, https://doi.org/10.1093/ref:odnb/7197.

Mapping the city

Leybourn shaped the physical and economic landscape of London and gained new and powerful political connections not by openly advocating for a specific political position, but rather from his involvement in the surveying of London after the Great Fire in 1666. But before he was able to secure this position of power as a government-appointed official, Leybourn cemented his reputation as a successful surveyor through a series of surveying manuals.

In 1650, Leybourn released a small pamphlet on surveying. Entitled *Planometria*, the pamphlet was the basis of his most well-known work –*The Compleat Surveyor*– a text that would go through nine editions in his lifetime and more after his death. *Planometria* was not a carefully crafted *magnum opus*. In the preface to the reader, Leybourn acknowledged that the work "might have been more refin'd had time permitted."[71] Indeed, he hurried the text to publication in order to fill a knowledge gap: as he wrote in the preface, "the scarcity of Books of this subject…hath been the sole motive which induced me to divulge the following Treatise."[72] Publishing on this area with a "scarcity of Books" offered him both the opportunity to establish himself intellectually by addressing this knowledge gap while providing economic opportunities associated with publishing in an area with no competition.

The title page of *Planometria*, however, reveals some surprises. First, Leybourn was not listed as the author; rather, the work was attributed to Oliver Wallinby, which was not another author by Leybourn's pseudonym. *Planometria* was neither Leybourn's first work, nor was it focused on a polarizing topic, so why the need to conceal his identity?

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[71] Oliver Wallinby [William Leybourn], *Planometria* (London, 1650), Preface to the reader, nf.

[72] Wallinby [Leybourn], *Planometria*, A3 r.

Instead of publishing a second edition of *Planometria*, Leybourn chose to take these same ideas but "rebrand" himself and his work, producing the first edition of *The Compleat Surveyor* in 1653. In this text, Leybourn admits to using the pseudonym Oliver Wallinby, "that name being only the true letters of my own name transposed."[73] His reasoning for using the pseudonym being he "was indeed very unwilling the World should know me to be the Author thereof" because the text was written hastily "and therefore must needs be little less then monstrous."[74] Leybourn did not want to risk damaging his reputation by distributing *Planometria* under his own name without knowledge of how it would be received by the public. However, "the good acceptance which that Pamphlet received, occasioned me to prosecute that Subject more at large."[75] He authored *The Compleat Surveyor* (1653) in response to the positive feedback generated from *Planometria*.

Thus, *The Compleat Surveyor* represents not only an expansion of Leybourn's ideas on the topic of surveying but also his desire to cement his reputation and capitalize on what he found to be a successful area of publication. As we saw already in other areas, Leybourn had an acute sense of the market and with this text it is evident that finances were not only a motivator for Leybourn to publish certain texts but actually shaped what he worked on in certain cases. Indeed, in this first edition of *The Compleat Surveyor*, Leybourn's portrait was printed next to the title page; a complete reversal in confidence from his publishing of *Planometria* under a pseudonym. Leybourn dedicates *The Compleat Surveyor* to Edmund Wingate asking him "to

[73] William Leybourn, *The Compleat Surveyor* (London, 1653), A2 r.

[74] Leybourn, *Compleat Surveyor* (1653), A2 r.

[75] Leybourn, *Compleat Surveyor* (1653), A2 r.

protect it" from potential "Detractors."[76] Thus, in this first edition of the new text, Leybourn is unafraid to advertise both himself and his connections.

Although the work was originally published to fill a gap in knowledge, Leybourn asserts his audience is still the common man, not "Masters of Art."[77] He notes that the text was written with the intention "to instruct the ignorant"[78] and was crafted "to make every particular therein conteined plain and perspicuous."[79] This focus on making surveying accessible to those without expertise in mathematics would become especially important in the following years as the Great Fire of London placed the burden of surveying on the public.

Surveying the city

In September of 1666, a fire broke out in the home of Thomas Faryner, royal baker to King Charles II. Later termed the Great Fire of London for the extensive destruction left in its wake, the conflagration is thought to have consumed 13,000 houses, leaving 70,000 people displaced.[80] With his experience as both an intellectual and as a businessman, Leybourn positioned himself to make the most of London's devastation. As noted by C.E. Kenney in his article "William Leybourn, 1626 – 1716," "The Great Fire proved to be a great opportunity for Leybourn, and he did not fail to take it. Many of his works, especially those to do with building

[76] Leybourn, *Compleat Surveyor* (1653), A2 r.

[77] Leybourn, *Compleat Surveyor* (1653), Preface to the reader, nf.

[78] William Leybourn, *The Compleat Surveyor* (London, 1657), 308.

[79] Leybourn, *Compleat Surveyor* (1657), 308.

[80] D'Maris Coffman, Judy Z. Stephenson, and Nathan Sussman, "Financing the Rebuilding of the City of London after the Great Fire of 1666," *The Economic History Review*, February 7, 2022, 1120–50, https://doi.org/https://doi.org/10.1111/ehr.13136, 1120.

and quantity surveying, were the direct result of the Fire, and were written to meet the demand."[81]

As noted by D'Maris Coffman, Judy Z. Stephenson, and Nathan Sussman in their 2022 article "Financing the rebuilding of the City of London after the Great Fire of 1666," "The event gave the restored King an opportunity to demonstrate both generosity and ability."[82] As noted in the diary of Sir Roger Pratt, Charles II's Commissioner for rebuilding London

> "His Majesty King Charles the 2nd was pleased … to appoint his Surveyour for ye present Mr. Hugh May, Doctor Renne, and myselfe to be his Commissioners to treat with such as the Citty should think fit to nominate about the more quick and orderly reedification of the citty, who sente to us Mr. Milles their Surveyour and Mr. Hooke Professor of ye Mathematics in Gresham Colledge, and Mr. Germain an experienced man in buildings.
>
> About the beginning of Octob: 1666 wee had our first meeting, wherein it beeing much controverted whether that part of the citty now burned, were commensurable. Whereupon at our second meeteing about Octob: the 8, wee ordered that Surveyours should bee appointed for the measurement of each particular Ward of the citty… and likewise to pitch upon some fitting sallary for each Surveyour, as 12d per howse etc. wherewith the city most readily completed."[83]

William Leybourn was among the men appointed to survey the damage along with [names]. While his network had previously only consisted of economic and intellectual connections, his role as a surveyor appointed by the city inserted him into the political sphere of London as well.

Leybourn's new political connections are testified in his edition of *The Compleat Surveyor* published in the years following the fire. After the great fire, Leybourn dedicated his 1679 edition and the following ones to "Sir Thomas Player, Knight, Chamberlain of the

[81] Kenney, "William Leybourn," 160.

[82] Coffman, Stephenson, and Sussman, "Financing the Rebuilding," 1121.

[83] Kenney, "William Leybourn," 162.

Honourable City of London."[84] While Leybourn's previous dedicatory epistles sought protection, this dedicatory epistle acts more of a thank you for acts already completed. Leybourn writes

> "for that these few years since London's dreadful Conflagration, I have been employed in the Admeasurements of the Publick Works belonging to this Honourable City, in which your Worship is so deservedly dignified both Place and Person."[85]

Coupled with his printing of the earlier explained works of royalist support, Leybourn's association with the English Crown is undeniable. However, it is clear that even in his role as a surveyor, his political ambitions remain subordinate to, or at least do not overshadow his business interests.

Along with working as a surveyor for the city of London, William Leybourn was one of two main authors who provided pattern books to help Londoners "enhance their expertise on valuation"[86] and advocate for themselves and their property in the rebuilding of the city. In his 2002 article "The Institution of Residential Investment in Seventeenth-Century London," William Baer introduces William Leybourn as the rival of Stephen Primatt, the other author of pattern books during this period. Although they were competing for the intellectual attention and economic investment of Londoners, Leybourn saw the worth –maybe not intellectual but certainly economic– of Primatt's thoughts, reprinting his book "in its entirety thirteen years later, only adding a section of his own on measurement."[87] Leybourn's addition of his own section is notable as it reaffirms his capacity for scholarly pursuits even though he was printing the work of another intellectual. Through this text, *The city and country purchaser and builder*, Leybourn set aside any hostile sentiment in favor of furthering his intellectual and economic goals.

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[84] William Leybourn, *The Compleat Surveyor* (London, 1679), Dedicatory epistle, nf.

[85] Leybourn, *Compleat Surveyor* (1679), Dedicatory epistle, nf.

[86] William C. Baer, "The Institution of Residential Investment in Seventeenth-Century London," *The Business History Review* 76, no. 3 (2002): 515–51, https://doi.org/https://doi.org/10.2307/4127797, 531.

[87] Baer, "Institution of Residential Investment," 531.

A year later, Leybourn distributed his own work on the subject entitled *A Platform for Purchasers, A Guide for Builders, A Mate for Measurers*. In the later 1685 edition, Leybourn notes that this first edition

> "was intended chiefly for the information of such Persons as were concerned either in Letting, Buying, Selling or Building, of (or upon) Ground then in the Ruins of the City of London, occasioned by the Dreadful Fire."[88]

In attempting to help Londoners rebuild, Leybourn essentially admits to capitalizing off of the physical and economic destruction of London. That said, the existence of numerous editions of this text even beyond the period immediately following the Great Fire is evidence of the text's more general importance. Moreover, Leybourn's impact on the physical and intellectual landscape of London continued long after his death in 1716 with a posthumous edition of *The Compleat Surveyor* published shortly after.

[88] William Leybourn, *A Platform for Purchasers, A Guide for Builders, A Mate for Measurers*, IV vols. (London, 1685), A4 r.

Chapter 4: The "Bridge"

Chapter 4 demonstrates Leybourn's role as a uniting factor within the English intellectual world through digital reconstructions of his network. The application of Digital Humanities technologies for the same database on which the more traditional components of the thesis are built brings Leybourn's circle to life and illuminates the connections that he created –and maybe, more importantly, the disconnections that arise without his presence– within the network. William Leybourn was not simply plugged into a preexisting network, connections between scholars, craftsmen, politicians, etc. were both created and dependent on his active involvement.

The digital project can be accessed at the links below. This is a dynamic project and the linked Observable notebooks represent the most up-to-date version as of March 27, 2024.

Click here:

Main Observable notebook

Visualization 1

Visualization 2

Or copy and paste the URLs:

Main Observable notebook - https://observablehq.com/d/ec88da2a5c1ea3b5

Visualization 1 - https://observablehq.com/d/12228a44c5c4a684

Visualization 2 - https://observablehq.com/d/97fa2754ee9a6d5d

Conclusion: Leybourn's Network after Leybourn

William Leybourn is not a household name. But maybe he should be. Although he has been preserved in the historical record as merely a footnote, Leybourn's influence outlived his earthly presence. Along with numerous editions of his works published posthumously, Leybourn's works have been found on the shelves of significant people. Perhaps most notably, his works lined the shelves of United States founding father George Washington. As asserted by Kevin Hayes in his *George Washington: A Life in Books*, "Perhaps no single work holds a greater place in [Washington's] school exercises than William Leybourn's *Compleat Surveyor*."[89] Despite the geographical distance between the United States and England, Washington relied on Leybourn's text as it "remained the standard in the field well into the eighteenth century."[90]

William Leybourn's network extended beyond periods, borders, and belief systems. In analyzing Leybourn's community, it is obvious that intellectual networks cannot continue to be studied in isolation if they are to be fully understood. From astronomers and astrologers to printers and political elites, the only shared node connecting this intricate web of intellectuals was William Leybourn.

[89] Hayes, *George Washington,* 29.

[90] Hayes, *George Washington,* 29.

Appendix A

The database on which this project is based can be accessed at one of the links below. This is a dynamic project and the linked Google Sheet represents the most up-to-date version of the database as of March 27, 2024.

Click here:

William Leybourn Database

Or copy and paste the URL:

https://docs.google.com/spreadsheets/d/1tG4qcLGyXWeIdqGauILONvXTyCccB7HdMvXysHPhFRQ/edit?usp=sharing

Appendix B

Whoer'e thou art that doest desire to know
What those are that thus act in a dumb shew,
This Page shall be the Prologue to descry
Th' intentions of this silent Comedie.
First, to disclose the Scaene, 'tis fit we should,
The Curtain of darke Ignorance unfold,
This, for a long time did our Language keepe,
Fetter'd in a Long-waking-walking-sleepe,
Untill our Authors rousing, open threw
The Curtain, and bid Ignorance adew:
But not content to see themselves, so long
As We were blinded by an unknown Tongue,
They'ave made this Sun of knowledge to arise
In our Horizon, seen by English eyes;
Yet not so perfectly, but there remains
Some Terra incognita for after-pains,
Although in all their Course they'ave sailed by
Those Sea-marks of rev'rend Antiquity,
And gone beyond them too, a Pigmies sight
(Above a Giant) goes beyond his height.
Now view the fair URANIA, and see
How Shee's supported by Geometry,
And quick Arithmetick, whose only part,
Is as the ABC to this curious Art,
Whose hands contain, and offer to the eye
Those Globes of Science, which unfolded lye
Within the Book. Turn over then and see,
And learn by that Practique Astronomy.[91]

[91] Wing and Leybourn, *Urania Practica*, nf.

Bibliography

Primary Sources

Castelli, Benedetto. *Of the Mensuration of Running Waters.* Translated by Thomas Salusbury. 3rd ed. London, 1661. Accessed via *Early English Books Online*.

Forde, Thomas. *Virtus Rediviva*. London, 1660. Accessed via *Early English Books Online*.

Galilei, Galileo, Johannes Kepler, Diego de Zuñiga, Paolo Foscarini, and Benedetto Castelli. *Mathematical Collections and Translations in Two Part*s. Translated by Thomas Salusbury. London, 1667. Accessed via *Early English Books Online*.

Gunter, Edmund, Samuel Foster, and William Leybourn. *The Works of Edmund Gunter*. Edited by Henry Bond. 4th ed. London, 1662. Accessed via *Early English Books Online*.

Leybourn, William, and Richard Sault. *Pleasure with Profit*. London, 1694. Accessed via *Early English Books Online*.

Leybourn, William. *A Platform for Purchasers, A Guide for Builders, A Mate for Measurers*. IV vols. London, 1685. Accessed via *Early English Books Online*.

Leybourn, William. *Speculum Anni: or, A Glasse in which you may behold the revolution of the yeare of our Lord God MDCXLVIII*. London, 1648. Accessed via *Early English Books Online.*

Leybourn, William. *The Compleat Surveyor*. London, 1653. Accessed via *Early English Books Online.*

Leybourn, William. *The Compleat Surveyor*. London, 1657. Accessed via *Early English Books Online.*

Leybourn, William. *The Compleat Surveyor*. London, 1679. Accessed via *Early English Books Online.*

Morgan, Sylvanus. *The Sphere of Gentry*. London, 1661. Accessed via *Early English Books Online.*

Newton, John. *Astronomia Britannica, Exhibiting the Doctrine of the Sphere, and Theory of the Planets Decimally by Trigonometry, and by Tables*. London, 1657. Accessed via *Early English Books Online.*

Wallinby, Oliver [William Leybourn]. *Planometria*. London, 1650. Accessed via *Early English Books Online.*

Wing, Vincent, and William Leybourn. *Ens fictum Shakerlaei: or the Annihilation of Mr. Jeremie Shakerley, his in-artificiall Anatomy of Urania Practica.* London, 1649. Accessed via *Early English Books Online.*

Wing, Vincent, and William Leybourn. *Urania Practica: or, Practical Astronomie: In VI Parts*. London, 1649. Accessed via *Early English Books Online.*

Wing, Vincent. *Olympia Domata*. London, 1662. Accessed via *Early English Books Online.*

Secondary Sources

Baer, William C. “The Institution of Residential Investment in Seventeenth-Century London.” *The Business History Review* 76, no. 3 (2002): 515–51. https://doi.org/https://doi.org/10.2307/4127797.

Bendall, Sarah. “Leybourn, William.” Oxford Dictionary of National Biography, January 3, 2008. https://doi.org/10.1093/ref:odnb/16623.

Brotons, Victor Navarro. “The Reception of Copernicus in Sixteenth-Century Spain: The Case of Diego de Zuniga.” *Isis* 86, no. 1 (March 1995): 52–78. https://doi.org/https://www.jstor.org/stable/236409.

Coffman, D’Maris, Judy Z. Stephenson, and Nathan Sussman. “Financing the Rebuilding of the City of London after the Great Fire of 1666.” *The Economic History Review*, February 7, 2022, 1120–50. https://doi.org/https://doi.org/10.1111/ehr.13136.

De Bujanda, J. M. *Index Librorum Prohibitorum: 1600-1966*. Vol. 11. Genève: Librairie Droz, 2002.

Edmond, Mary. “Davenant [D’Avenant], Sir William.” Oxford Dictionary of National Biography, October 8, 2009. https://doi.org/10.1093/ref:odnb/7197.

Fransen, Sietske. “Introduction: Translators and Translations of Early Modern Science.” Essay. In *Translating Early Modern Science*, edited by Sietske Fransen, Niall Hodson, and Karl A.E. Enenkel, 1–14. Brill, 2017. http://www.jstor.org/stable/10.1163/j.ctv2gjwp05.7.

Gadd, Ian. “The Stationers’ Company, 1403–1775: London’s Book Trade Guild.” Oxford Research Encyclopedias: Literature, May 26, 2021. https://doi.org/10.1093/acrefore/9780190201098.013.262.

Hayes, Kevin J. George Washington: A Life in Books. New York, NY: Oxford University Press, 2017.

Johnson, Francis R. “Gresham College: Precursor of the Royal Society.” *Journal of the History of Ideas* 1, no. 40 (October 1940): 413–38. https://doi.org/https://doi.org/10.2307/2707123.

Kenney, C. E. “William Leybourn, 1626 – 1716.” *The Library*, 5, 5, no. 3 (December 1, 1950): 159–71. https://doi.org/https://doi.org/10.1093/library/s5-V.3.159.

Lee, Sidney. “Forde, Thomas.” Edited by F.D.A. Burns. Oxford Dictionary of National Biography, September 23, 2004. https://doi.org/10.1093/ref:odnb/9873.

Plescia, Iolanda. “‘Now Brought before You in English Habit’: An Early Modern Translation of Galileo into English.” *Translating Early Modern Science*, 2017, 286–307. https://doi.org/10.1163/9789004349261_013.

Rabin, Sheila. “Nicolaus Copernicus.” Stanford Encyclopedia of Philosophy, September 13, 2019. https://plato.stanford.edu/entries/copernicus/.

Shapin, Steven. *The Scientific Revolution*. Chicago, IL: The University of Chicago Press, 1996.

Taylor, E.G.R. *The Mathematical Practitioners of Tudor & Stuart England*. Cambridge: Cambridge University Press, 1954.

Warren, Christopher N., Daniel Shore, Jessica Otis, Lawrence Wang, Mike Finegold, and Cosma Shalizi. Six Degrees of Francis Bacon. Accessed March 27, 2024. http://www.sixdegreesoffrancisbacon.com/.

“What’s the difference between astronomy and astrology?” American Astronomical Society. https://aas.org/faq/whats-difference-between-astronomy-and-astrology.

Willmoth, Frances. “Shakerley, Jeremy.” Oxford Dictionary of National Biography, September 23, 2004. https://doi.org/10.1093/ref:odnb/25197.