'Very inconsiderable except^g that they are the Hand writing of so great a Man': The Provenance of Isaac Newton's Manuscripts at New College, Oxford

INTRODUCTION

The year 1872 was of great importance for Isaac Newton's (1642–1727) vast archive of manuscripts. It was the year the jumbled collection of papers went from Hurstbourne, Hampshire, to the University of Cambridge, at the discretion of the Fifth Earl of Portsmouth. There they were catalogued for the next 16 years, after which the 'scientific' papers were kept in Cambridge and the remainder returned to the Portsmouth family.[1] That same year, 1872, a set of Newton's manuscripts was bequeathed to New College, Oxford, by the Reverend Jeffrey Ekins (1803–1872). Although Newton scholars were well aware of this collection, its provenance is shrouded in mystery. Equally mysterious is a set of manuscripts relating to Biblical prophecy, church history, and chronology, sent in November 1755 by John Wallop (1742–1797), the Second Earl of Portsmouth, to Arthur Ashley Sykes (*c.* 1684–1756), a religious controversialist.[2] In contrast to the New College collection, the provenance of this set was well known. What happened to them after Sykes's inspection, however, was not. In February 1770, a little note was added to the back of the list of borrowed papers saying: 'Found Feb^y: 1770. This Memo: preserv'd by U : Portsmouth as she knows not whether the Papers specifiy'd were return'd by D^r Sykes.'[3] The mysterious whereabouts of this set of manuscripts and the equally mysterious provenance of the papers at New College were quickly linked. Allegedly, Sykes left the manuscripts to the Reverend Jeffrey Ekins (1699–1773) upon his death in 1756. The papers were then passed down within the Ekins family until they were donated to New College in 1872. The main evidence for this version of the story is a codicil attached to the will of Newton's half-niece, Catherine Barton (1679–1739), later Catherine Conduitt, who along with her husband, John Conduitt (1688–1737), came into possession of the entire archive after Newton's death in 1727. The codicil instructs the executor of her will to lend Sykes a certain set of Newton's papers so that they can be prepared for printing. Oddly enough, Catherine's wish was not granted until 1755, when a set of papers was finally sent to Sykes. According to the standard story, the papers Catherine described in her codicil are the papers that Wallop eventually sent to Sykes in 1755. However, I question this and propose an alternative story. Cornelis J. Schilt was the first to question the standard story by pointing out the discrepancies between the list of papers mentioned in Catherine's codicil, the list of papers Wallop sent to Sykes, and the actual contents of the New College papers.[4] I am deeply indebted to him for his critical approach, helpful suggestions, and, above all, his unparalleled expertise in the Newton archive. Before turning to the New College collection, I discuss the provenance of the entire archive of manuscripts between Newton's death in 1727 and the time when the New College collection was separated from the rest.

The New College manuscripts give us invaluable insight into Newton's writing practice. They paint a picture of a man eager to write down his thoughts on any available paper. This far-reaching form of recycling explains why Newton's writings on chronology appear alongside his notes as Master of the Mint, why drafts for the *Scholium generale* first added to the second edition of the *Principia* in 1713 appear alongside Newton's interpretation of biblical passages, and why the

[1] Sarah Dry, *The Newton Papers: The Strange and True Odyssey of Isaac Newton's Manuscripts* (Oxford: Oxford University Press, 2014), pp. 80–82.

[2] Cornelis J. Schilt, 'Of Manuscripts and Men: The Editorial History of Isaac Newton's *Chronology* and *Observations*', *Notes and Records* 74 (2020), 387–408, at p. 404.

[3] D. T. Whiteside, *The Mathematical Papers of Isaac Newton, Vol. I, 1664–1666* (Cambridge: Cambridge University Press, 1967), p. xxiv; Schilt, 'Of Manuscripts and Men', 405. The original manuscript is kept at King's College, Cambridge (henceforth 'KCC'), Keynes MS 127A(4), to which I did not have access.

[4] Schilt, 'Of Manuscripts and Men', 404–406.

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now-famous optical diagram appears alongside correspondence with a London financier.[5] In March of 2022, I had the pleasure of going through this manuscript collection with the generous help of the wonderful staff of the New College Library. I was specifically looking for parts of the collection unrelated to its central themes of chronology, church history, and Biblical exegesis. Instead, I hoped to find manuscript folios on which Newton wrote drafts of his natural philosophical methodology as published in the Queries to the *Opticks* or the *Regulae philosophandi* to the *Principia*. Folios that Newton then reused to write on one of the themes central to the collection, hence explaining how they were catalogued. As part of my PhD on the development of Newton's natural philosophical methodology, it is crucial to identify and uncover these drafts tucked away in thematically unrelated collections. They offer invaluable insights into the evolution of Newton's thought on key topics such as the relationship between natural philosophy and moral philosophy. Initially, I planned to write an article for this journal about these unidentified drafts, with a small introduction about the provenance of the whole collection. That introduction would serve to explain why the passages I focus on are part of this collection and not another, thus to a considerable extent determining our knowledge of the development of Newton's thought. In writing the brief introduction on the provenance of the collection, I quickly encountered a few issues with the standard story. Working out the problems and providing a new account was already quite an undertaking, forcing me to shift the focus of the article entirely to the provenance.

In the final section, I discuss the provenance of a particular draft in the New College collection, i.e. the optical diagram appearing on f. 45^{v} of the second volume. Despite its notoriety and even though the provenance of the diagram featured in the scholarship before, there are still some issues that need ironing out. Moreover, this story has not yet been covered in this journal. Thus, it is worthwhile to reiterate the current state of research on the origin of this diagram.

Newton's Surviving Archive

Mystery surrounds the history of the Newton manuscripts at New College, Oxford. Through the sustained efforts of several authors, including Rob Iliffe, Sarah Dry, and Jason Morgan, the veil of obscurity has been lifted and the history documented.[6] Although there is consensus among these authors, there are still gaps in our knowledge of the acquisition history of the manuscripts. First we need to understand the history of Newton's entire archive.[7]

On his death in March 1727, Newton left behind an enormous number of books and papers. Since he left no will that specified a use for the archive, the books were quickly sold and the manuscripts were kept safe by Catherine Conduitt and her husband, John Conduitt.[8] Some have suggested that, despite the lack of a will, Newton deemed the surviving manuscripts to have some benefit to posterity simply because he did not dispose of them. For instance, John Maynard Keynes (1883–1946) thought that Newton deliberately destroyed those parts of his archive that he did not see fit for posterity and *vice versa*.[9] This argument hinges on the persistent belief that Newton

[5] For more on Newton's writing practice in the New College collection in particular, see Jack Avery, '"A chain of invincible reasoning"? Isaac Newton's Writing Practices in the New College Manuscripts', *New College Notes* 17 (2022) no. 6, and Cornelis J. Schilt, *Isaac Newton and the Study of Chronology: Prophecy, History, and Method* (Amsterdam: Amsterdam University Press, 2021).

[6] Dry, *The Newton Papers*; Jason Morgan, 'Seeing the Light: Being the story of Sir Isaac Newton's prisms and papers and the means by which they came to New College', *New College Notes* 9 (2018), no. 10; and Rob Iliffe, 'A "connected system"? The snare of a beautiful hand and the unity of Newton's archive', in *Archives of the Scientific Revolution: The Formation and Exchange of Ideas in Seventeenth-Century Europe*, ed. Michael Hunter (Woodbridge: Boydell Press, 1998), pp. 137–58.

[7] For more on the history of the archive as a whole, see Dry, *The Newton Papers*; John Harrison, *The Library of Isaac Newton* (Cambridge: Cambridge University Press, 1978); and The Newton Project (henceforth 'TNP') on <www.newtonproject.ox.ac.uk/>.

[8] For the history of Newton's library, see Harrison, *Library of Isaac Newton*, pp. 28–57.

[9] KCC, Keynes to L.F. Gilbert, September 28, 1937, KCL, JMK-67-PP-60-f13. I was not able to consult this specific letter. My account is derived from the quotes and paraphrases from Dry, *The Newton Papers*, pp. 156–157.

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destroyed part of his papers shortly before his death[10]. *If* this were true, *then* one could legitimately search for specific reasons why Newton destroyed some papers rather than others. However, there is no conclusive evidence that Newton deliberately destroyed large chunks of his archive and even less evidence indicating *why* he would have done so. The only evidence supporting that claim are testimonies by Conduitt and Samuel Crell (*c.* 1657–1747). In a letter to Bernard de Fontenelle from late 1727, Conduitt states:

> '[O]ne great instance of this [Newton's work ethic] are the rheams of foul & loose papers he has left behind in his own hand besides many he burnt not long before he died some of which are the same thing writt over six or seven times.'[11]

Another testimony by Conduitt is often mentioned in the same breath. It pertains to his work at the Royal Mint and the depositions of coiners and clippers in particular:

> 'His [Newton] trouble when Warden in prosecuting clippers & coiners attended all the trials wee burnt boxfulls of informations in his own handwriting taken by himself he brought in the tool act.'[12]

Furthermore, Crell mentions the following in a letter to Maturin Veyssière La Croze (1661–1739) from July 17, 1727:

> 'Paucis ante mortem septimanis non pauca sua manu scripta in ignem coniecit ipse. Reliquit tamen quaedam imprimenda, inter quae est *historia dominationis clericorum*, ut testabatur clar. MEADUS, quo medico utebatur [A few weeks before his death he threw into the fire many manuscripts written in his own hand. He left, however, some to be printed, among which is one entitled *Historia Dominationis Clericorum*, as I was assured by his physician, the celebrated Dr. Mead].'[13]

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[10] The authors advocating this view are listed here. David Brewster, *Memoirs of the Life, Writings, and Discoveries of Sir Isaac Newton*, Vol. II (Edinburgh: Thomas Constable and Co., 1855), p. 300: 'We are informed by Conduitt that he destroyed many of his papers before his death, and it is probable that some of them were letters which he deemed of no importance.' Louis Trenchard More, *Isaac Newton: A Biography* (New York: Charles Scribner's Sons, 1934), pp. ix and 665: 'During his last illness, Newton burned a great mass of personal papers; and he must have wished to preserve the same jealous aloofness after death which he had maintained during life for no family nor intimate letters were saved . . . It is probable, also, that he sorted and burned a great number of personal papers.' Curiously, More first claims with certainty that Newton destroyed some of his papers while later qualifying that claim as merely probable. Whiteside, *Mathematical Papers of Isaac Newton*, p. x: 'No longer can we know with certainty what he himself intended when he gathered his writings together in the last months of his life, burning a great part of his personal correspondence and, we may suspect, certain inferior technical papers he was unwilling to communicate to his successors.' Although most of these authors do not elaborate their claims on this particular issue of Newton's destruction of part of his writings, I believe they all rely on the testimonies of Conduitt, Samuel Crell, or both (see infra for these testimonies). Presumably, Conduitt's testimony was the most influential because it is and was readily available in biographies and secondary literature in general. Biographers that do not mention the destruction of papers by Newton at all, are: William Stukeley, *Memoirs of Sir Isaac Newton's Life* (Royal Society Library MS 142, 1752), f. 20^{r} (available on TNP: <www.newtonproject.ox.ac.uk/view/texts/normalized/OTHE00001>) and the popularising Edward Neville da Costa Andrade, *Sir Isaac Newton: His Life and Works* (New York: The Macmillan Company, 1954).

[11] KCC, Keynes MS 129.02, f. 4$^{r–v}$. This is the normalised version of the draft present kept at KCC and transcribed on TNP, 'Drafts of various sections of the Memoir of Newton' <www.newtonproject.ox.ac.uk/view/texts/normalized/THEM00146>. See also Richard S. Westfall, *Never at Rest: A Biography of Isaac Newton* (Cambridge: Cambridge University Press, 1980), p. 868 and Whiteside, *Mathematical Papers of Isaac Newton*, pp. xii–xiii.

[12] KCC, Keynes MS 130.07, f. 3^{r}.

[13] Maturin Veyssière La Croze, ed. Johann Ludwig Uhl, *Thesaurus epistolici Lacroziani Tomus I*, (Leipzig: Johann Friedrich Gleditsch, 1742), p. 105; emphasis in original. Translation by Brewster, *Memoirs of the Life, Writings, and Discoveries of Sir Isaac Newton*, p. 390. See also Frank E. Manuel, *A Portrait of Isaac Newton* (Harvard: Belknap Press of Harvard University Press, 1968), pp. 15 and 399.

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There is no way to verify whether these testimonies are true.[14] But given the diversity of the surviving manuscripts, it is difficult to imagine what has been destroyed. Newton was clearly unperturbed by leaving his heterodox views in writing for posterity to discover. Of course, we cannot know just how radical Newton's views were, of which he might have destroyed all evidence, leaving only the 'mildly' heterodox writings behind. These suggestions illustrate the extent to which we can speculate on the matter and show that we should be careful attributing particular motives to Newton. Modern biographies and accounts of Newton's archive take a more descriptive approach, for instance Richard S. Westfall:

> He did one other thing as he prepared for death. He burned a number of papers; at least Conduitt testified to such. When one considers the papers he left behind, multiple drafts and scraps on every topic known to have interested him, even sheets covered with nothing but raw calculations, it is difficult to imagine what he destroyed, and why.[15]

In short, it is possible that Newton destroyed parts of his archive shortly before his death. The two independent testimonies of people with close ties to Newton suggest as much. However, there is no evidence of *what* Newton destroyed—if anything—let alone *why* he did so.

The New College Collection

Shortly after Newton's death, Thomas Pellet (*c.* 1672–1744) was appointed to examine the papers and assess which of them were suitable for printing. Over three days in May 1727, he categorised them very roughly and often ambiguously, deeming only five manuscripts suitable for printing. Conduitt inherited those deemed unfit to be printed and planned to write a biography of Newton that would include the material from those manuscripts. We know that the New College manuscripts were still part of the archive at that time, as Conduitt's handwriting appears on some of its folios—presumably as part of plan to write Newton's biography. Unfortunately, he failed to complete the task and died in 1737. Catherine, in turn, had her own plans to have published parts of the theological and chronological manuscripts, but failed to do so during her lifetime.[16]

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[14] According to Whiteside, Conduitt's testimonies should not be taken lightly: 'Conduitt did little more than make a reasoned, not very critical compilation of the many anecdotes for which he canvassed among Newton's acquaintances or which he pencilled down in his little green notebooks from his reading of published literature. His collection (now for the most part gathered in Keynes MS 130–137 at KCC) is the source for most of the usual stories about Newton the man, some accurate and invaluable, others mythical and worthless' (Whiteside, *Mathematical Papers of Isaac Newton*, p. xxii).

[15] Westfall, *Never at Rest*, p. 868. Other authors that take a similar approach are listed here. Manuel, *A Portrait of Isaac Newton*, pp. 386–387. Although Manuel is sceptical of Whiteside's outright affirmation of Conduitt's claim, he concludes that what must have been thrown in the fire is Newton's correspondence with his family: 'The selection of what he tossed into the flames, one might infer from the papers that have survived, was haphazard, with one exception—there are virtually no letters from his family.' Earlier, John William Navin Sullivan, *Isaac Newton 1642–1727* (New York: The Macmillan Company, 1938), p. 141, had also taken note of Newton only burning the correspondence with his mother near the end of his life: 'From Newton himself we learn nothing about his relations with his mother, and he took care to destroy all her letters and whatever other evidence there may have been of the relations between them.' Westfall doubts this conclusion because there is no evidence of a lost body of correspondence (*Never at Rest*, p. 868). Dry, *The Newton Papers*, pp. 5 and 9: 'When he felt the end was near, Newton began to prepare . . . He also burned a number of papers, the mention of which, made by a surviving heir [I presume this heir is Conduitt], is casual, as if nothing significant had been destroyed . . . As mentioned, despite having ample time to prepare one, he left no will. Nor did he destroy his papers . . . He left his papers unassigned but also undestroyed.' Dry takes Conduitt's testimony at face value, but also suggests that Newton did *not* purposefully destroy parts of his archive to keep his (heterodox) preoccupations a secret—given the survival of so much rough material on so many different topics.

[16] After the publication of the *Chronology of Ancient Kingdoms Amended* (1728) and the *Observations upon the Prophecies of Daniel and the Apocalypse of St John* (1733), Newton's religious beliefs came under scrutiny. This resulted in criticism and disdain for Newton's scholarship. Dry suggests that these controversies might have inclined Catherine to publish other parts of Newton's archive (*The Newton Papers*, p. 28).

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However, she solidified her aim by adding a codicil to her will in 1737, instructing the executor to send 'all the Tracts relating to Divinity' to Sykes.[17] Apparently, this request was refused for several years by both the executor of the will and John and Catherine Conduitt's daughter, Catherine (Kitty) Conduitt (1721–1750)—later Kitty Wallop, 'Lady Lymington'. In July 1740, Kitty married John Wallop (1718–1749), who was to become Viscount Lymington when his father acceded to the title of first Earl of Portsmouth in 1743. Their son John Wallop, the second Earl of Portsmouth, inherited Newton's manuscripts. The papers remained in possession of the Portsmouth family until they were donated to Cambridge University in 1872, with the remainders sold at Sotheby's on 13 July 1936. Only in 1755 would a part of the collection be sent to Sykes, presumably following the unauthorized and incomplete publication of Newton's 'An Historical account of two Notable Corruptions of Scripture' in 1754. Sykes failed to publish any of the tracts before he died a year later, in November 1756.[18] According to the standard story, the parts of the collection in his possession were not returned to the Portsmouths, but inherited by Jeffrey Ekins (1699–1773).[19] They remained in the possession of the Ekins family until 1872, when they were bequeathed to New College by Jeffrey Ekins (1803–1872).

So, in the standard story, the New College papers were part of the Portsmouth collection until they were sent to Sykes in 1755, in accordance with Catherine's wishes outlined in the codicil to her will. On Sykes's death in 1756, the papers were then inherited by Ekins.[20] The problem with this story, however, is that too little attention is paid to the descriptions in the various lists and the contents they refer to. Schilt was the first to raise this issue.[21] He points out the discrepancy between the papers mentioned in the codicil, those mentioned in the Wallop list from 1755, and those present in New College. As will be shown, all the surviving lists contain ambiguous descriptions referring to equally ambiguous sets of manuscripts. This is due to the fact that the archive was in disarray at the time and that it was difficult to find coherent wholes to which uniform names could be assigned. Moreover, the authors of the various lists had their own idiosyncratic descriptions of certain 'wholes'. So, we can only tentatively claim that the descriptions in the lists cover certain parts of the Newton's archive. This adds a first layer of uncertainty to any analysis of this topic.

Before delving into the various surviving lists, we need a clearer picture of the *contents of the New College papers*. Fortunately, many eminent scholars—most of whom are associated with The Newton Project—have laid the groundwork for cataloguing a collection that is still largely in disorder. The first volume of the collection consists of drafts of various works: *A Short Chronicle from the first memory of things in Europe to the conquest of Persia by Alexander the Great* (an abstract of the *Chronology of Ancient Kingdoms Amended* Newton wrote for Princess Caroline in 1717), 'The Original of Monarchies' (a chapter for a larger work Newton was composing on the origins of civilisations), and the *Chronology*. The second volume consists largely of unordered papers related to chronology, the Mint, and various correspondence. Almost no coherent drafts can be discerned, except a few

[17] New College Library, Oxford (henceforth 'NCO'), MS 361/4, f. 139^{r}.

[18] It is often claimed that—before he died—Sykes compiled a 'digest' of the papers handed to him by the Portsmouth family, see for instance Whiteside, *Mathematical Papers of Isaac Newton*, p. xxiii and Morgan, 'Seeing the Light'. The word 'digest' is put in scare quotes because it is (most likely) derived from a letter by William Hanbury sent to Robert Smith on 11 April 1757: 'The gentleman L^{d} Portsmouth employed to digest the papers [it is unclear which papers exactly are referred to] was, I hear, the Late D^{r} Sykes' (Trinity College Library, Cambridge (henceforth 'TCL'), MS R.16.38, f. 422^{r}; digitally available in The James Catalogue of Western Manuscripts: <https://mss-cat.trin.cam.ac.uk/Manuscript/R.16.38B>). Note that Hansbury here mentions what Sykes was *supposed to do*, i.e. digest the papers, not what he eventually *did*. As far as I know, no available source mentions what Sykes actually managed to do with the papers that he perused before his death.

[19] There are no accounts on how this particular transaction between Sykes—before or after his death—and Ekins came about. There is some confusion on which Jeffrey Ekins actually got the papers first, as highlighted by Morgan ('Seeing the Light'). This issue will be addressed later.

[20] Sykes's last will and testament does not contain any mention of Newton's manuscripts. The will is preserved by The National Archives in London (henceforth 'TNA') PROB 11/826/213, f. 395$^{r–v}$.

[21] Schilt, 'Of Manuscripts and Men', 387–408.

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relating to the *Chronology* and its Latin edition, whose plans were short-lived. The third volume, again, consists of drafts relating to Newton's chronological work, but also the 'Theologiae Gentilis Origines Philosophicae' or 'On the (Natural) Philosophical Origins of Pagan Theology'. Lastly, the fourth volume contains different parts of 'An Historical Account of Two Notable Corruptions of Scripture, in a Letter to a Friend [John Locke]' and related papers, such as—notably—the codicil to Catherine's last will and testament.[22] That codicil contains the *first list* of manuscripts to be sent to Sykes:

> I [Catherine Conduitt] will, and appoint and ordain, that my Executor [Alexander Chalmers] do lay all the Tracts relating to divinity before D^{r} Sykes, and in hopes he will prepare them for the press. There are two critical pieces one on the three that bear Record in Heaven, and another upon the Text who thought it not robbery &^{c} w^{ch} I will have printed, and theres a piece called paradoxicall questions concerning Athanations, another the history of the Creed or criticism on it, and a Church History compleat and many more Devinity tracts, all of them I ordain shall be printed, and published so as they be done with care, and exactness.[23]

As I indicated earlier, the descriptions are rather vague, but nevertheless concrete enough to link to particular sets of manuscripts. For instance, the underlined text refers to Scripture: the 'three that bear Record in Heaven' refers to the passage 1 John 5.7 on the Holy Trinity, whereas 'who thought it not robbery' refers to the Philippians 2.6 on the equality of God and Christ. These references, in turn, allow me to track Newton's writings on that particular subject. The former presumably refers to the 'Two Notable Corruptions of Scripture' from the fourth volume of the New College manuscripts.[24] The first sentence reads: 'Since the discourses of some late writers have raised in you a curiosity, of knowing the truth of that text of Scripture concerning the testimony of *the three in heaven 1 Iohn 5.7*: I have here sent you an account of what the reading has been in all ages, & by [what?] steps it has been changed, so far as I can hitherto determine by records.'[25] Additionally, Ekins in 1757 refers to this set of manuscripts as 'one little tract relating to y^{e} controverted text 1 John 5,7 &c ↓[illegible]↓ which surreptitiously got into print about two or three years ago', adding yet more substance to the connection between the description and the tract present in the New College collection.[26] The latter underlined text could refer to Newton's theological notebook now kept at King's College, Cambridge. Although Philippians 2.6 is explicitly mentioned, this only happens halfway through the treatise and surrounded by dozens of other biblical references: 'Look not every man on his own things but also every man on y^{e} things of others. Let this mind be in you w^{ch} was also in christ Iesus: Who being in y^{e} form of God *thought it not robbery* to be equall with God.'[27] Next, the 'piece called paradoxicall questions concerning Athanations' indubitably refers to a tract kept at King's College titled 'Paradoxical Questions concerning the morals & actions of Athanasius & his followers.'[28] The 'history of the Creed or criticism on it' presumably refers to yet another manuscript kept at King's College titled the

[22] NCO, MS 361/1, 361/2, 361/3, and 361/4. See also Jed Z. Buchwald and Mordechai Feingold, *Newton and the Origins of Civilization* (Princeton: Princeton University Press, 2013), and Schilt, *Isaac Newton and the Study of Chronology*.
[23] NCO, MS 361/4, f. 139^{r}.
[24] Schilt, 'Of Manuscripts and Men', 404–405.
[25] NCO, MS 361/4, f. 1^{r}; emphasis added, transcription based on the one found on the TNP <www.newtonproject.ox.ac.uk/view/texts/normalized/THEM00261>. The transcription conventions I use here and throughout are: words between arrows pointing downwards were added to the main text; words that are struck through are words that Newton crossed out; and illegible words are indicated by [illegible].
[26] Ekins refers to the unauthorized publication of the incomplete version of 'An Historical account of two Notable Corruptions of Scripture'.
[27] KCC, Keynes MS 2; emphasis is mine, transcription by TNP <www.newtonproject.ox.ac.uk/view/texts/diplomatic/THEM00180>.
[28] KCC, Keynes MS 10. Transcription provided by TNP on: <www.newtonproject.ox.ac.uk/view/texts/diplomatic/THEM00010>.

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'*Irenicum*, or Ecclesiastical Polyty tending to Peace'.[29] The 'Church History compleat' probably refers to the drafts on the history of the church in the Yahuda collection and 'Of the Church' in the Bodmer collection.[30] Lastly, 'many more Devinity tracts' is too vague a description to associate with a particular set of manuscripts. This dissection of Catherine's list shows that in all likelihood, some—and definitely not all—manuscripts that had to be sent to Sykes ended up in the New College collection.

The *second list* I dissect is the one Wallop compiled of works *actually* sent to Sykes in 1755:

> 'An Acc[ount] of Sir Isaac Newton's papers—sent to the Rev. Dr. Sikes in London', consisted of 'No (1) A bundle of Papers on the Revelation & Daniel compleat', 'No 2 A bundle of papers—Complete Chapters of the Host of Heaven &c 6 papers folded which are Duplicates Relating where they are put', 'No 3 A bundle of papers of Loose Independent pieces of little use—unless any may afford any hint in writing Sir I.'s life', 'No 4 A bundle of Papers on the Revelation some part duplicate', 'No 5 A bundle of papers of no Connection or use being only Memorandums which Sir Isaac made out of Book's', 'No 6 papers of Jewish Synagogues & Christian Churches (loose papers)', 'No 7 Proemium to Church History &c a bundle', 'No 8 A book of Chronology &c', 'No 9 Duplicates & papers relating to the time—Imperfect', 'No 10 An Abstract, or first thoughts on the Host of Heaven' and 'No 11 on the Revelation, some little duplicates'.[31]

Once again, (almost) *none* of these entries refer to the contents of the New College volumes. '(1) A bundle of Papers on the Revelation & Daniel compleat' presumably refers to the part of the Yahuda collection's 'miscellaneous drafts and fragments on prophecy, principally Daniel and Revelation' and 'draft passages on chronology and biblical history'.[32] The second entry titled 'Complete Chapter of the Host of Heaven' probably refers to the drafts on the history of the church in the Yahuda collection and 'Of the Church' in the Bodmer collection.[33] Both contain multiple chapters that include 'The Host of Heaven' in their respective titles. Because the 10th entry on the list also includes 'the Host of Heaven', it might also refer to various parts of the Yahuda and Bodmer collections. Note that—if correct—this entry refers to the same set of manuscripts as the 'Church History compleat' from the codicil list. Unfortunately, the 'bundle of papers of Loose Independent pieces of little use' is impossible to trace. '4 A bundle of Papers on the Revelation' could very well refer to (parts of) the untitled treatise on revelation now part of the Yahuda collection.[34] Entry '11 on the Revelation' might relate to various parts of this same treatise. '5 A bundle of papers of no Connection or use being only Memorandums which Sir Isaac made out of Book's' is—again—an ambiguous description and may refer to many sets of manuscripts, for instance the miscellaneous theological extracts and notes from the Yahuda collection.[35] Next,

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[29] KCC, Keynes MS 3. Transcription provided by TNP on: <www.newtonproject.ox.ac.uk/view/texts/diplomatic/THEM00003>.

[30] The National Library of Israel, Jerusalem (henceforth 'NLI'), Yahuda Var. 1 MS 15, the manuscripts can be consulted on the website of the library <www.nli.org.il/en/discover/humanities/newton-manuscripts> and the transcriptions are accessible on TNP <www.newtonproject.ox.ac.uk/catalogue/record/THEM00058>; Fondation Martin Bodmer, Geneva, Bodmer MS. Steffen Ducheyne suggests that these collections together with Babson MS 438, present in the Huntington Library, San Marino, California, may have been part of the same lot at the 1936 Sotheby auction, later split into two or three: 'Isaac Newton's 'Of the Church': Manuscript Description and Analysis of Bodmer MS in Geneva', *European Journal of Science and Theology* 5 (2) (2009), 25–35.

[31] Iliffe, 'A "Connected System"?', p. 141. The original manuscript is kept at KCC, Keynes MS 127A(4), to which I did not have access.

[32] NLI, Yahuda Var. 1 MSS 7 and 25.

[33] NLI, Yahuda Var. 1 MS 15; Fondation Martin Bodmer, Geneva, Bodmer MS.

[34] NLI, Yahuda Var. 1 MS 1. Transcriptions are found on TNP: <www.newtonproject.ox.ac.uk/catalogue/record/THEM00044>.

[35] NLI, Yahuda Var. 1 MS 13. Transcriptions are found on TNP: <www.newtonproject.ox.ac.uk/catalogue/record/THEM00056>.

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'6 papers of Jewish Synagogues & Christian Churches' may refer to 'Chap. Of the Temple & Synagogues of the Iews' or 'Fragments on the kingdoms of the European tribes, the Temple and the history of Jewish and Christian Churches' from the Yahuda collection.[36] '7 Proemium to Church History &c a bundle' refers to the set of manuscripts of that exact name in the Yahuda collection, i.e. 'Proœmium and first chapter of a treatise on Church history'.[37] One possible candidate to which the entry '8 A book of Chronology' refers is the various draft chapters in the New College collection. However, there are other suitable candidates that fit this description from other collections. For instance, there are two versions of the *Chronology* in the Cambridge University Library that fit the description of 'A book' perfectly because both are nearly-completed.[38] Next, '9 Duplicates & papers relating to the time' could refer to many of Newton's chronological studies, but the 'Considerations about rectifying the Iulian Kalendar' and the tracts on calendar reform in general from the Yahuda collection are suitable candidates.[39] That it is labelled 'Imperfect' may be due to the fact that the folios also contain an alchemical recipe. However, it is not possible to draw this conclusion definitively, as many sets fit this broad description. In short, some entries in this list undoubtedly refer to manuscript sets *not* present in the New College volumes while others may refer to parts of those volumes or—equally likely—refer to parts of other collections.[40]

Despite the fact that he failed to publish any of Newton's tracts mentioned in Wallop's list, Sykes's own work suggests that he was inspired by Newton's ideas in the manuscripts. Schilt has identified some similarities between Sykes's *An Enquiry when the Resurrection of the Body, or Flesh, was first inserted into the Public Creeds*, published posthumously in 1758, and Newton's manuscripts in the Bodmer MS.[41]

So, the manuscripts sent to Sykes in 1755 were quickly returned in whole or in part to the Portsmouths after the latter's death in 1756. There they remained until the Sotheby auction in 1936, when they became part of the Yahuda and Bodmer collections. In contrast, The New College manuscripts are vastly different from those sent to Sykes, except perhaps the book on chronology. There is even evidence to support the claim that the manuscripts under the perusal of Sykes were returned after his death. It appears in a letter from Phil Barton to William Hanbury from 25 March 1757:

> He [Lord Portsmouth] says that ↓*all*↓ *the Papers he has, w^th^ relate to S^r^ Isaac Newton are in the Country at his seat in Hampshire*. That they were lately under the Perusal of a Gentleman who died before y^t^ Perusal was finished, y^t^ they ~~we~~ are very voluminous & it will be a matter of much time & trouble to examine them w^th^ care. At the same time his Lordship

[36] NLI, Yahuda Var. 1 MSS 26.3 and 28. Transcriptions are found on TNP: <www.newtonproject.ox.ac.uk/view/texts/diplomatic/THEM00407>.

[37] NLI, Yahuda Var. 1 MS 11.

[38] Cambridge University Library (henceforth 'CUL'), MSS Add. 3987 and 3988.

[39] NLI, Yahuda Var. 1 MS 24.1. Transcriptions are found on TNP: <www.newtonproject.ox.ac.uk/catalogue/record/THEM00067>.

[40] Schilt was the first to point out that only '8 A Book of Chronology' may refer to parts of the New College collection ('Of Manuscripts and Men', 405–406). I expand upon his concise analysis. Additionally, Schilt has helped me tremendously in comparing the different lists to the contemporary collections.

[41] Schilt, 'Of Manuscripts and Men', 406–407, n. 78. In addition to a comparative study, Schilt relies on the following assertion by Sykes's biographer: 'The next, and last work of our author's, was posthumous, in respect to it's [sic] publication, though it was prepared for, if not gone to the press before his death. His brother, Mr. George Sykes, appears as the editor; but very little trouble, it is apprehended, devolved upon him. I have been assured, that *this tract was composed chiefly from the papers of Sir Isaac Newton*; and it is very possible, from certain other circumstances, that such information may be true; the editor however has given no information of this kind, and I cannot but think there is much internal evidence of this tract having been chiefly, if not wholly written by Dr. Sykes. But this supposition of my own, is made with deference to the account which ascribes some of the materials to Sir Isaac Newton, and may indeed, in part, be very consistent with the truth of it': John Disney, *Memoirs of the Life and Writings of Arthur Ashley Sykes* (London: Printed for J. Johnson, 1785), pp. 344–5; emphasis added. Of course, Sykes only had access to some of the Newton manuscripts for a brief time between 1755 and 1756, when he died. Clarifying the various lists and collections will allow a more thorough analysis of the similarities between Newton's and Sykes's works.

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> says that they shall be examined & if either M^{r} Cotes's or any other Letter will be of Use to the learned World He is ready to communicate them in a proper manner.[42]

Neither the interlocutors nor Lord Portsmouth knew that *not* all of the papers were back in Hampshire. That same year, in a letter to Joseph Wilcox dated 27 March, Ekins discusses a collection of manuscripts that came into his possession. This *third list* corresponds to the current New College collection:

> [N]one of them are perfect except^{g} one little tract relating to y^{e} controverted text 1 John 5,7 &c ↓[illegible]↓ which surreptitiously got into print about two or three years ago. The rest seem to be very inconsiderable except^{g} that they are the Hand writing of so great a Man. You have seen them therefore know w.^{t} they are. But I should have mentioned that the manuscript of S^{r} Isaac's Chronology is amongst these papers & is pretty fairly wrote no other Papers of S^{r}. Isaac's have ever come to my Hands or Knowledge.[43]

Once again, we are dealing with very rough descriptions of sets of manuscripts. In this case, this should not surprise us, as it was clearly not Ekins' intention to provide an accurate and complete list of the papers in his custody. This time, however, we are confident that the description does match the manuscripts currently held at New College. As mentioned above, the 'little tract relating to y^{e} controverted text 1 John 5,7' refers to Newton's drafts of the 'Two Notable Corruptions of Scripture'. Although he considers the other manuscripts 'inconsiderable', he points out that there are drafts for the *Chronology* among them. Whether this corresponds to the 'book of Chronology' mentioned by Wallop cannot be determined.

The main conclusion I draw from the previous *exposé* is that there is no rigid set of manuscripts that found its way from the Conduitt's and the Wallop's to Ekins via Sykes. Instead, a narrative emerges in which Newton's archive is constantly being torn apart. If we assume that some New College papers—most notably the drafts for the *Chronology*—were once in Sykes's possession and others were never sent to him (for instance, no entry in Wallop's list alludes to the 'Two Notable Corruptions of Scripture'), then it is almost incomprehensible how the current New College collection was formed. After Sykes's death some of the manuscripts would have been bequeathed by Ekins while others went back to the Portsmouths. Moreover, others were still in the hands of the Portsmouths while Sykes possessed the papers from Wallop's list. How then did these become part of the collection? Were they sent to Sykes at another time or did Ekins receive them directly from the Portsmouth family? This plethora of complications arises from combining the standard story with our contemporary knowledge of the manuscript collections. However, I believe there is a simple solution to these problems. It is predicated on the assumption that *none*—not even the book on chronology—of the entries on Wallop's list match the manuscripts now kept at New College. In other words, Sykes never had access to those papers and certainly did not—directly or indirectly—hand them over to Ekins. So, how did the New College collection come about? The answer is found in a testimony by Ekins himself which, although often quoted by commentators, has never been properly assessed. The testimony is found in the abovementioned letter from Ekins to Wilcox from 1757:

> Mrs. Conduitt had once an intention of publishing some Theological tracts of S^{r}. Isaac's ~~Newtons~~ and added a Codicil in her Will for that purpose describing that ~~mig~~ might be

[42] TCL, MS R.16.38, f. 415^{r}; emphasis added.
[43] NCO, MS 361/4, f. 141^{v}. This letter is presumably Ekins's. Hanbury's copy is found in TCL, MS R.16.38, ff. 416^{r}–417^{r}.

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> first revised by D^r^. Sykes some few of these were found in the hands of her executor after his decease, & are at present in my custody.[44]

That Catherine wanted some manuscripts revised and prepared for publication by Sykes is now well established. And indeed, some but not all the manuscripts mentioned in the codicil are part of the New College collection, as my dissection of the lists and volumes above has shown. We also know from her last will and testament that Catherine's sole executor was the Reverend Alexander Chalmers (?-1745).[45] So, Ekins claims that *some* of the manuscripts mentioned in Catherine's codicil were in Chalmers' custody at the time of his death. Subsequently, the manuscripts came into Ekins' hands. This testimony raises three questions. First, as I have shown earlier, parts of the list mentioned in Catherine's codicil are—in fact—currently part of the New College collection. Ekins suggests that *all* the papers in his custody were part of the Catherine's list. Is this the case? Unfortunately, this cannot be determined with certainty because the entries in the list are too ambiguous. However, we do have some reason to trust Ekins' assessment, as I show below. Second, why did Chalmers keep the papers and explicitly ignore Catherine's wish to send them to Sykes? Again, we cannot establish this with certainty.[46] Third, how were the manuscripts transferred from Chalmers to Ekins? Ekins does not elaborate on this exact point. We may be able to answer this question more accurately by relying on additional testimonies and wills.

Previous commentators have suggested that Sykes assumed the role of executor on Chalmer's death in 1745 and that this might somehow be related to the provenance of the New College collection.[47] However, the only evidence that anyone took on that role after Chalmers's death leads to Ekins. This much is suggested by Hanbury in a letter to Robert Smith from 8 March 1757:

> The papers in the hands of the Rev^d^ m^r^ Ekins (who transacted the affairs of m^rs^ Conduit, & was executor to the late Lady Lymington) are cheifly tracts of Divinity.[48]

That Ekins assumed (some of) Chalmers's duties explains how he suddenly gained access to the collection of Newton papers. Unlike Sykes, Ekins frequently appears in Catherine's will (*not* the codicil) and is often mentioned in the same breath as Chalmers.[49] He was also one of three executors of Kitty Wallop's will, reinforcing the links between the two families.[50] So, it is not surprising that Ekins was bestowed with the task of handling Catherine's affairs after Chalmers's death. At this point, I would be remiss not to mention the sole version of this story that suggests Sykes never had anything to do with the New College papers:

> Mr. Conduitt died a few months after the date of this codicil, and Mrs. Conduitt in January 1739, and *there is reason to believe that the papers were never put into the hands of Dr. Sykes*. After the marriage of Miss Conduitt to Mr. Wallop, afterwards Lord Lymington, the manuscripts went into their possession, and some of them, including the Historical Account, *were given by Lady Lymington to her executor Mr. Jeffery Ekins*, from whom they

[44] NCO, MS 361/4, f. 141^r–v^.
[45] TNA PROB 11/700/343, ff. 261^v^–264^r^.
[46] I pass no moral judgement on this issue as we have no evidence that Chalmers acted in good or bad faith.
[47] Whiteside, *Mathematical Papers of Isaac Newton*, p. xxiv; Morgan, 'Seeing the Light'.
[48] TCL, MS R.16.38, f. 410^r^. Hanbury and Smith were looking for Newton's 'commonplace book' at that time and apparently searched for it in the collection Ekins had in safekeeping. Whiteside thinks the 'book' may refer to Newton's Waste Book, now kept at the Cambridge University Library (*Mathematical Papers of Isaac Newton*, p. xxiv; CUL, MS Add. 4004). This testimony leaves no doubt that Ekins (1699–1773) inherited the manuscripts and not his son Jeffrey Ekins (1731–1791), which Morgan has already convincingly shown ('Seeing the Light').
[49] TNA PROB 11/700/343, f. 262^r^.
[50] Morgan did an excellent job of tracing and portraying the relationship between the Ekins, Barton, and Newton families ('Seeing the Light').

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> passed successively into the hands of the Dean of Carlisle, the Rector of Morpeth, and the Rev. Jeffery Ekins, Rector of Sampford, who now possesses them.[51]

Sir David Brewster thus believes that the New College papers were never in Sykes's custody but does not address the evidence that led him to that conclusion. Morgan has suggested that Brewster drew his conclusions from a short note written by Miss Susan Ekins (*d.* 1812), daughter of Jeffrey Ekins (1699–1773), present in the fourth volume of the New College collection and/or from personal correspondence with Ekins (1803–1872).[52] In her brief note, Susan Ekins mentions that her father got the manuscripts 'either as executor of Lady Lymington, or left to him by her will.'[53] While it is true that Ekins assumed the role of executor of Kitty Wallop, it is unclear whether this is relevant to the provenance of the New College manuscripts.[54] Rather, I assume that Ekins's testimony takes precedence over Susan Ekins's and that Ekins's close relationship with Catherine and Chalmers is therefore of paramount importance. Besides appearing frequently in Catherine's will, Ekins is also important in Chalmers's will. There, he was one of two people asked to verify its authenticity, because he reportedly knew Chalmers's handwriting and character well.[55] Although Ekins was not the executor to Chalmers's will, their close relationship makes it more likely that Ekins inherited some of Chalmers's possessions. To reinforce this conclusion, I also point out that the manuscripts may not have been the only Newton-related items that found their way from Chalmers to Ekins. In her will, Catherine leaves to Chalmers 'Sir Isaac Newton's two pictures and buste'. Lo and behold, what does Ekins bequeath to New College in 1872? 'A Statuette and Engravings of the said Sir Isaac Newton.'[56] It is tempting to assume these are the bust and pictures Catherine originally bequeathed to Chalmers. But because we have no idea which bust Catherine was originally referring to *and* because the New College bust has since disappeared, it is impossible to verify.[57] However, since all of the circumstantial evidence points in the same direction, it seems reasonable to assume that somehow Chalmers' Newton-related items ended up with Ekins. Possibly, Kitty Wallop was involved in this, as Brewster suggests, but that is rather unlikely as in 1755 the Wallops do not seem to have been aware of the collection Chalmers had in custody nor the contents of Catherine's codicil. The fact that Wallop sent none of the New College papers to Sykes in 1755 suggests that they were already in Ekins' custody. Now, this particular transaction between Chalmers and Ekins may have taken place as early as 1745, when Chalmers died, and as late as 1755. Unfortunately, there is no information on the whereabouts of the collection between these points in time. Presumably, Ekins received the papers shortly after Chalmers's death. But

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[51] Brewster, *Memoirs of the Life, Writings, and Discoveries of Sir Isaac Newton*, p. 342; emphasis added.
[52] Morgan, 'Seeing the Light'.
[53] NCO, MS 361/4, f. 146^{r}. This version of the story also appears in John Hodgson, *A History of Northumberland, in Three Parts*, Part II, Vol. II (Newcastle: Charles Henry Cook, 1832), p. 527: 'Mr Ekins was executor to Lady Lemington, grand-niece of sir Isaac Newton, and, as such, or by her will, came into possession of several of the Original MSS. of that philosopher . . . The whole of these manuscripts are at present in the possession of his grandson, the rev. F. Ekins, at the Rectory-house in Morpeth'. Hodgson was the source for the weaker claim appearing in Frederick Ekins's obituary in *The Gentleman's Magazine* of May 1842: 'the deceased possessed several MSS. of Sir Isaac Newton, which descended to him from his grandfather, who was executor to Lady Lemington, the great-niece of the illustrious philosopher'., Sylvanus Urban, *The Gentleman's Magazine*, Vol. XVII, January to June (London: William Pickering, John Bowyer Nichols and Son, 1842), p. 562.
[54] In her will, Kitty Wallop does not explicitly bequeath (parts of) Newton's manuscripts to Ekins. See TNA PROB 11/781/144, ff. 157^{v}–158^{r}.
[55] TNA PROB 11/740/502, f. 332$^{r–v}$.
[56] Although I have not consulted the original of Ekins's 1872 will, present in the New College Archives (NCA 2844/4), there is an illustration of it and the receipt of the Newton items (signed by Warden Sewell on 18 November 1873) in Morgan ('Seeing the Light').
[57] Apparently, in addition to the bust, pictures, and manuscripts, Ekins also donated a lock of Newton's hair to New College in 1872. Since there are currently no records of this lock of hair prior to its donation to New College, it is impossible to say when and where Ekins received it. It is tempting to assume that it was part of the Newton memorabilia that Chalmers either directly or indirectly gave to Ekins.

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since Ekins does not explain *how* and *when* these items came into his possession and none of the wills or testimonies of his descendants elaborate on this, I am afraid this matter is lost to history.[58]

NEWTON'S PRISM DIAGRAM

Diagram page (verso), New College Library, Oxford, MS 361/2, f. 45v

[58] None of the wills from members of the Ekins family to Jeffrey Ekins, who bequeathed them to New College, contain any reference to the Newton manuscripts, the bust or the pictures. For Jeffrey Ekins's (1699–1773) will, see TNA PROB 11/991/153, ff. 60r–61r; for Jeffrey Ekins's (1731–1791) will, see TNA PROB 11/1212/12, f. 29r–v; for Frederick Ekins's (1767–1842) will, see TNA PROB 11/1968/31, f. 22r–v.

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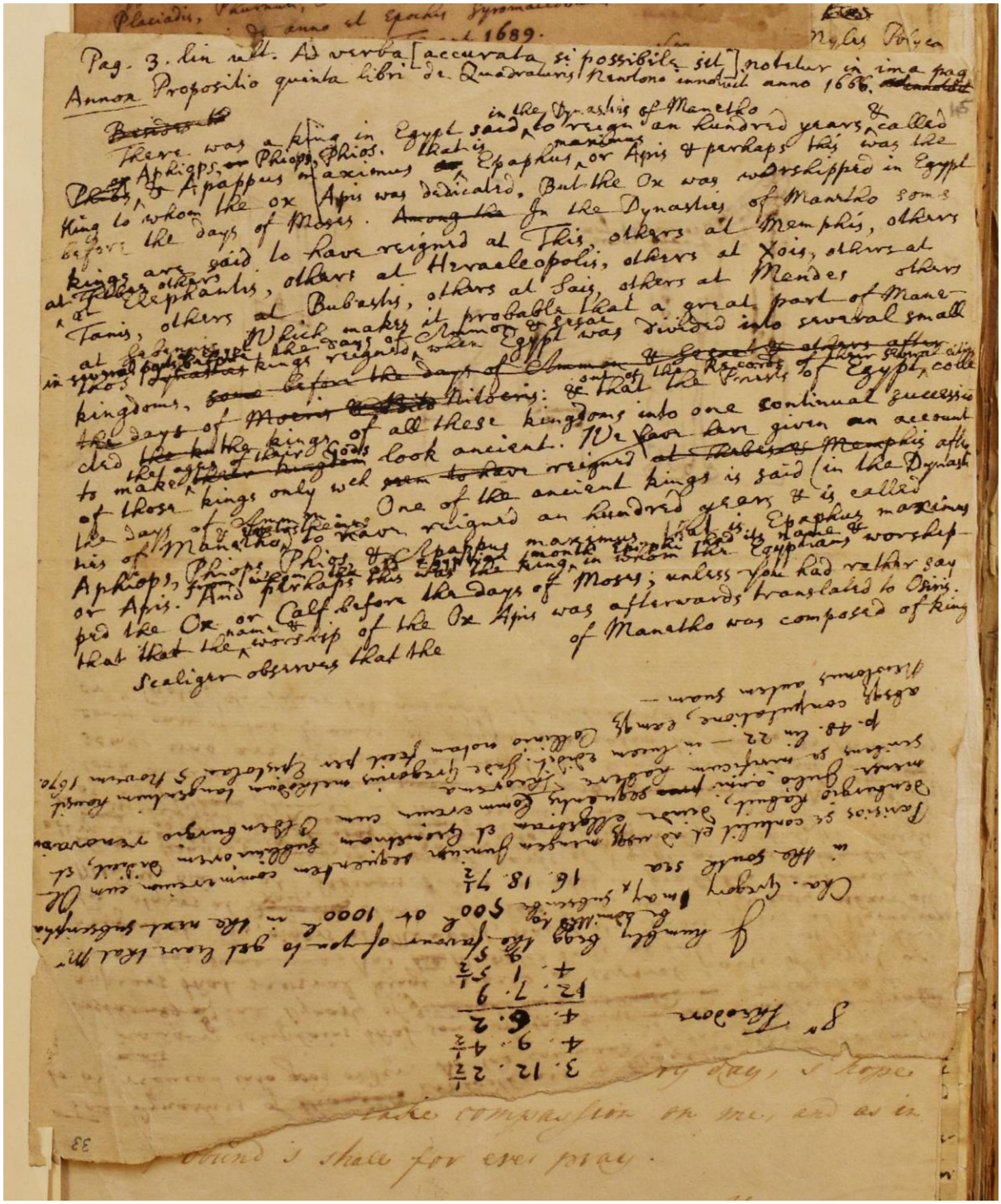

Diagram page (recto), New College Library, Oxford, MS 361/2, f. 45r

One of New College Library's most prized possessions is a sketch of a prism experiment by Newton's hand, found in the second volume of the New College manuscripts. The inscription on the sketch reads: '*Nec variat lux fracta colorem* [refracted light does not vary its colour].'[59] Newton considered several options for placing the inscription on the diagram, as evidenced by the multiple crossed out versions in various places and directions. Furthermore, beneath the sketch the initials

[59] NCO, MS 361/2, f. 45v, translation by A. Rupert Hall and Laura Tilling, *The Correspondence of Isaac Newton, Volume VII, 1718–1727* (Cambridge: Cambridge University Press, 1977), p. 165, n. 10.

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'J.E.' appear. We can only assume these are the initials of 'Jeffrey Ekins' who must also have understood the significance of this sketch. While it is fairly clear what name these initials spell out, it is less clear to whom they refer. There are no less than *three* individuals named 'Jeffrey Ekins' who owned the manuscripts during their lifetime: the Reverend Jeffrey Ekins, Rector of Barton Seagrave, Northamptonshire (1699–1773); the Very Reverend Jeffrey Ekins, Dean of Carlisle (1731–1791); and the Reverend Jeffrey Ekins, Rector of Little Sampford, Essex (1803–1872).[60] We can only speculate which of these three signed the sketch with his initials.

That Newton chose this particular experiment to illustrate the claim that refracted light does not change colours, should not surprise us, because it bears close resemblance to what he coined the '*experimentum crucis*' or 'crucial experiment' earlier in his career. This experiment was first introduced in Newton's first paper titled the 'New Theory of Light and Colors' and—as its name suggests—was crucial in proving his theory *and* disproving others.[61] Despite the obvious similarities that commentators like to point out between the crucial experiment and the New College sketch, there are also striking differences.

First, the original *experimentum crucis* from 1672 was supposed to prove that light—and sunlight in particular—consists of rays that are all differently refrangible. According to Newton, this explains the elongated image caused by passing light through a prism. Moreover, it overrides other explanations, such as the variable inclinations of the light rays coming from the sun. Despite the rays being equally refrangible, their initial inclination caused them to be refracted to other places on the wall. Newton's crucial experiment ruled out such explanations and confirmed his own. So, Newton only invoked this experiment to prove the unequal refrangibility of light rays, but *not* that colours are connate properties of those rays or that 'refracted light does not vary its colour.' Even in the 1704 *Opticks*, where this experimental arrangement appears as the 6th experiment, it is only meant to prove that 'The Light of the Sun consists of Rays differently Refrangible'.[62] In short, the purpose of the *experimentum crucis* was not to show that different rays of light have different connate colours, but only that all rays are differently refrangible.

This reasoning is predicated on the assumption that the sketch in the New College manuscripts was meant to depict the *experimentum crucis*. This brings me to my second point, the experimental setup in the sketch is quite different from the crucial experiment. The most striking difference is that the sketch contains a lens, whereas in the crucial experiment the sunlight entering the hole in the first board directly hits the first prism. Moreover, the lens and the first prism are far away from the window, whereas in the crucial experiment Newton 'placed one of them [the two boards] close behind the Prisme at the window, so that the light might pass through a small hole, made in it for the purpose'.[63] It is not clear whether he made these changes solely for the purpose of this sketch or whether he changed the setup of the original experiment to better prove his theory. In short, there are quite a few differences between the original *experimentum crucis* and the experiment appearing in New College sketch.[64] Not only the setup differs, but also its status, name, and purpose. Only in 1672 did Newton ever assign a priority status to a particular

[60] For a wonderful representation of the pedigree of the family Ekins and its ties to the Newton family, see Morgan, 'Seeing the Light'. A family tree of just the Ekins family also appears in Hodgson, *A History of Northumberland*, p. 527.
[61] Isaac Newton, 'A Letter of Mr. Isaac Newton, Mathematick Professor in the University of Cambridge; containing his New Theory about Light and Colors', *Philosophical Transactions* 80 (1672/3), 3075–3087.
[62] Isaac Newton, *Opticks: Or, a Treatise of the Reflexions, Refractions, Inflexions and Colours of Light* (London: Printed for Sam Smith and Benjamin Walford, 1704), pp. 18 and 30–32.
[63] Newton, 'New Theory of Light and Colors', p. 3078. Newton probably included a lens in the experimental setup to make sure the light rays enter the first prism parallel to one another. This way he excludes the possibility that the elongation of the image cast on the second board is caused by the varying inclinations of the rays entering the first prism. Note that in 1672 Newton did not add a diagram of the crucial experiment, only a description.
[64] J. A. Lohne noted that an error included in the sketch recurs in figure 24 from Book I, Part I of the *Opticks*, J. A. Lohne, '*Experimentum Crucis*', *Notes and Records* 23 (2) (1968), 169–99; Newton, *Opticks*, plate V: the red rays converge earlier than the violet rays, when in fact they should converge at the same time or at the same distance from the prism. In this particular case, this would mean that if the convergence of the red rays on the second board is correct, the violet rays should already converge before they hit the wall and start diverging again.

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experiment therefore calling it 'crucial'. Nowhere else does the term '*experimentum crucis*' appear, and whenever Newton cited the setup from that experiment after the 1672 paper, it was never given priority status. In the *Opticks*, for example, it merely appears as one of ten experiments meant to prove the second proposition of Book I. As I have shown, the original purpose of the crucial experiment was to show the different refrangibility of light rays, whereas the inscription on the diagram (if we may assume a connection between that inscription and the sketch of the experiment on which it appears) concerns the various colours of light rays. Perhaps Newton tinkered with the original crucial experiment to also prove the innate nature of colours to rays of light and therefore changed the experimental setup. If anything, the new setup would serve this purpose even better than the original, as the use of a lens leads to more accurate results and therefore better proves his theory of light and colours.

To better understand the intricacies of this famous sketch, I delve into its provenance and uncover its purpose. Although J. A. Lohne already revealed the history of the sketch in 1968,[65] it has not yet been extensively covered in this journal and is therefore worth repeating.[66] Additionally, I point out some gaps in our knowledge of the sketch.

The diagram was a sketch for the engraving—or *vignette*—placed at the beginning of each section of each Book of the second edition of the French translation of the *Opticks* from 1722, i.e. the *Traité d'Optique*.[67] In the years preceding the publication of that translation, there was considerable interest in Newton's *Opticks* both in Great Britain and on the continent. By then, the work had already appeared in three different English (1704, 1717, and 1721) and two Latin editions (1706 and 1719). The latter editions in particular helped spread Newton's theory of light and colours beyond the borders of Great Britain.[68] Thus arose the demand for translations in other languages. Pierre Coste (1668–1747) translated the 1718 English edition of the *Opticks* into French, which was published in Amsterdam in 1720. Pierre Varignon (1654–1722) was asked by the *Académie royale des sciences* to review Coste's translation and in 1721, found himself responsible for a second edition.[69] The reason for publishing a new edition was—presumably—the flawed nature of the first one. The original translation had no illustrations, contained many printing errors, and clearly suffered from Coste's lack of understanding of Newton's theory.[70] Varignon enlisted the help of someone knowledgeable about Newton's theory who could correct the flaws of the previous edition. That 'someone' was the mathematician Abraham De Moivre (1667–1754), a friend of Newton who was also involved in the publication of the first Latin edition of the *Opticks*

[65] Lohne acknowledges that Whiteside was the one who solved the mystery of the New College diagram for him ('*Experimentum Crucis*', 197).

[66] Both Avery and Morgan have featured the prism diagram in their respective publications in the *New College Notes* (Avery, '"A chain of invincible reasoning"?'; Morgan, 'Seeing the Light'). Both emphasized how difficult it is to date any part of Newton's manuscripts in the absence of explicit mentions of a date or when external clues are missing. Relying solely on the surrounding folios of a particular draft or even on the surrounding drafts on that exact folio always carries a risk. Newton constantly used and reused folios regardless of what they were originally used for, making it difficult for anyone to reconstruct the chronology based solely on the available texts. Even H. W. Turnbull in the first volume of *The Correspondence of Isaac Newton* from 1959—before the publication of Lohne's '*Experimentum Crucis*'—did not know the original purpose the sketch and therefore mistakenly attributed it to a much earlier date (H. W. Turnbull, *The Correspondence of Isaac Newton, Volume I, 1661–1675* (Cambridge: Cambridge University Press, 1959), p. 107 and the page facing it). In the seventh volume, Hall and Tilling correct Turnbull's mistake (*Correspondence*, p. 156, n. 5).

[67] Isaac Newton, transl. Pierre Coste, *Traité d'Optique sur les Réflexions, Réfractions, Inflexions, et les Couleurs, de la Lumière* (Paris: Montalant, 1722).

[68] Westfall, *Never at Rest*, p. 795. Westfall provides a fuller account of how Newton's theory spread across the continent.

[69] For more on the different translations of the *Opticks* in French, see Jean-François Baillon, 'Two Eighteenth-Century Translators of Newton's *Opticks*: Pierre Coste and Jean-Paul Marat', *Enlightenment and Dissent* 25 (2009), 1–29; Westfall, *Never at Rest*, pp. 794–8; Breno Arsioli Moura, 'The First French Translation of Book II of Newton's *Opticks*: Omissions, Abridgements and the Quest for Authorship', *Notes and Records* 76 (1) (2022), 1–22.

[70] William Hauptman, 'Two Chapters in the Art of Jacques-Antoine Arlaud (1668–1743): II—Arlaud and Newton's "*Experimentum Crucis*"', *The British Art Journal* 17 (3) (2017), 3–11.

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in 1706.[71] Subsequently, Varignon corresponded with Newton on the content and lay-out of the new French edition. Fortunately, the letters between Newton and Varignon and their respective drafts have been preserved, making it considerably easier to relate the New College sketch to the French translation. On 7 September 1721, Varignon requested Newton to provide a headpiece to be affixed to each section of each Book of the *Traité d'Optique*:

> You see, however, that the first sheet of this work of yours, which has been enclosed in the copy of our *Mémoires*, is lacking an engraved headpiece (in French a *vignette*) which will also be the headpiece and adornment of each section of each book; the cost of this will be more than met by the excess of your £20 sterling above the sum of money promised to the bookseller and what will be spent on binding the copies which you are to give away as presents. Further, as no one is better able than yourself to think of an idea for a headpiece suitable for your work, you will help us greatly if you will take steps to send us a sketch [prepared] under your direction by a skilful English draughtsman, to be engraved here.[72]

As requested, on 26 September, Newton sought a draughtsman to prepare the image for engraving.

> I approve your [idea of] prefixing each book with an illustration, but it is not yet drawn by the artist. I will soon spur the artist on.[73]

The message to Varignon implies that Newton already had the idea for the headpiece, but that it simply was not yet drawn at that time. This is also suggested by the fact that the set of folios, on which Newton drafted his reply to Varignon, bears the inscription '*Nec variat lux fracta colorem*'.[74] Moreover, below this inscription another sentence appears: '*Dispescit sed non variat lux fracta colores* [Light splits but the refracted light does not vary its colours].'[75] We can only assume that Newton considered both as a caption to his diagram, but ultimately preferred the former. That Newton was already considering which inscription to add suggests that he already had the design of the diagram in mind or even on paper. Whether these inscriptions were written at the time Newton made the sketch is unclear. It is also unclear who the 'artist' was. Hall and Tilling suggest that Newton meant Jacques-Antoine Arlaud (1668–1743), but this seems to contradict subsequent correspondence. Ultimately, Newton sent a sketch of his own to Varignon via De Moivre and did not employ 'a skilful English draughtsman' to streamline the image. At least this is what Varignon tells us in his letter of 28 November 1721:

> He [*De Moivre*] also sent the figure you have devised and sketched as an ornament for the beginning of your book. I see nothing more appropriate for the purpose than this, since it clearly refers, if I am not mistaken, to that decisive experiment by which you demonstrate beyond doubt the immutability of the colours of light, which is the basis of the same book of yours. I am looking out for an ingenious and skilful draughtsman to arrange the observers properly in this plate and to devise additions suitable to it.[76]

In his letter from 17 April 1722, he reports his progress and claims to have found an artist suitable for the task:

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[71] Westfall, *Never at Rest*, p. 648.
[72] Hall and Tilling, *Correspondence*, pp. 152–6; translation and text in brackets by the editors.
[73] ibid., pp. 160–166; translation and text in brackets by the editors.
[74] CUL, MS Add. 3968, ff. 601^{r}–602^{v}.
[75] Translation by Hall and Tilling, *Correspondence*, p. 165, n. 10.
[76] Hall and Tilling, *Correspondence*, pp. 178–80; translation and text in brackets by the editors.

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> As I had over and over again looked round for an artist whose aid I might employ for drawing and perfecting the headpiece for your book, [the sketch] you sent me being most suitable for the business, that is to say one well skilled in his art and intelligent, who can express your intention in it in a fitting style; wherever I turned (I say) to find this [man], I finally discovered no one better suited to the task and to yourself than Mr Araud, both by reason of the great skill which he possess in this art, and by reason of the respect with which he honours you most highly […] Moreover he thereupon promised me to take the whole care and responsibility upon himself, in order that the figure you wish for may be elegantly drawn and engraved to your intention; therefore I showed it to him, and he there and then made pretty thorough study of it […] Here is the drawing made ready for the engraver, if you think well of it. The rays [of light] which you drew in the original sketch, and which you accordingly see drawn in the copy, should be deleted in the opinion of Mr Arlaud, and in mine also. For in the illuminated space nothing ought to be separately discerned, nor indeed can be; whence the illuminated space ought to appear wholly white [on the paper]. Moreover, he thought that the spectators and cherubs with which we had planned to adorn this drawing should likewise be omitted.[77]

Varignon employed Arlaud's services between 28 November 1721 and 17 April 1722, when a first copy was sent to Newton for review. It is therefore unlikely that Newton already referred to Arlaud in his letter from 26 September 1721.[78] Presumably he had another draughtsman in mind at the time. Arlaud's comments on Newton's original design for the headpiece give us some idea of the original sketch sent to Varignon and its resemblance to the New College sketch. In the original sketch Varignon received, the beam of light contained discernible rays. In contrast, Arlaud chose to make the space illuminated by making the beam uniformly white. The discernible light rays are—in fact—a feature of the New College sketch, again suggesting a close resemblance between that sketch and the one sent to Varignon. Moreover, this fragment indicates that we lack some correspondence between Newton and Varignon, as it is unclear where 'the spectators and cherubs' they planned to add to the headpiece were first mentioned.

It turns out that an intermediate sketch survives that gives us a better understanding of the developments between the inception of the headpiece in the New College sketch and the final published version. It is currently kept in the *Bibliothèque de Genève*, along with a letter from Newton thanking Arlaud for his work on the headpiece.[79] The diagram is a neater version of the New College sketch. It features tighter lines, no alterations or scribbled text, and neat handwriting. On

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[77] ibid., pp. 199–201; translation and text in brackets by the editors.

[78] A letter from Varignon to Newton reveals that Arlaud and Newton had met during Arlaud's visit to England in 1721 (Hall and Tilling, *Correspondence*, pp. 178–80; see also Lohne, '*Experimentum Crucis*', 194; and Hauptman, 'Arlaud and Newton's "*Experimentum Crucis*"', 3–11). However, Arlaud was not considered the artist for the headpiece of the *Traité d'Optique* until two months later. Hall and Tilling suggest that Arlaud drew the *vignette* while in England, which is equally unlikely (*Correspondence*, pp. 213–4, n. 1). I assume that the source for this claim is J. B. Descamps. Descamps, however, does not explicitly state that Arlaud made the drawings during his visit to England (*La Vie des Peintres Flamandes, Allemands et Hollandois, avec des Portraits Gravés en Taille-douce, une Indication de leurs Principaux Ouvrages, & des Réflexions sur leurs Différentes Manières, Tome IV* (Paris: Charles-Antoine Jombert, 1763), pp. 116–122): '*Arlaut* devint l'ami des Grands et des Sçavans: *Newton* lui communiqua ses idées sur l'Optique que notre Peintre rendit sensibles par les figures [Arlaud became the friend of the Great and the Wise: Newton communicated to him his ideas on the *Opticks* which our painter made perceptible by the figures.]' To put it succinctly, it seems that Arlaud's visit to England and his task of drawing the headpiece are unrelated. For more on Arlaud and Newton, see Hauptman, 'Arlaud and Newton's "*Experimentum Crucis*"', 4.
Furthermore, Hall and Tilling claim Arlaud was responsible for drawing the 'figures' in the book (Hall and Tilling, *Correspondence*, pp. 213–4). I assume they mean the plates that appear after each part of the *Opticks*. However, I have found no evidence supporting this. Henry Guerlac was the first to point this out (*Newton on the Continent* (London: Cornell University Press, 1981), p. 156).

[79] Bibliothèque de Genève, D.O. autogr. 32/67. For the letter, see infra.

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the back, the following text appears: 'Cette description a esté faite par la propre main de l'illustre monsieur – le Chevalier Isaac Newton—President de la Société Royale de Londres et Directeur General des Monnoyes—d'Angleterre 1722 [This description was made by the very own hand of the illustrious mister Sir Isaac Newton, president of the Royal Society of London and director general of the mint of England.] Elle a esté envoyeé á Jaques Antoine Arlaud dans la mesme temps [It was sent to Jaques Antoine Arlaud at the same time.]'[80]

Where should we situate this particular sketch? To my knowledge, the sketch has only been covered in two articles, each with different views on who the designer is. On the one hand, Henry Guerlac in his book *Newton on the Continent* claims that the sketch was merely a neater version of the New College sketch drawn by Newton and sent to Varignon via De Moivre. If correct, then this would have been the sketch Varignon claimed was most 'appropriate for the purpose' on 29 November. Guerlac argues this based on Arlaud's inscription on the back of the prism page and the roughness of the New College sketch. He claims that Newton would certainly not hand over such an unfinished sketch to an artist. Everything points to this being a first attempt: the crossed-out beams of light, the several attempts to include the Latin motto, and the fact that the sketch appears on a folio with unrelated jottings on the front and back.[81] Guerlac thus concludes that Newton drew the Geneva sketch. On the other hand, William Hauptman has argued in the paper titled 'Two chapters in the art of Jacques-Antoine Arlaud (1668–1743): II—Arlaud and Newton's "*Experimentum Crucis*"' that the drawing was made by Arlaud following Newton's example from the New College sketch. On Hauptman's account, the Geneva sketch was drawn by Arlaud and sent to Newton for review. Hence, this was the sketch on which Arlaud commented in Varignon's letter to Newton of 17 April. Newton then returned the draft to Arlaud in whose possession it remained until it was bequeathed to the library of Geneva. If we accept this version of the story, then we have—in fact—access to all the various stages the headpiece went through: first, it was drawn up very roughly by Newton (New College sketch), who sent it to Arlaud to be redrawn. Newton then approved Arlaud's neater version (Geneva sketch) and his suggested changes, before it was finished, stylized, and prepared for engraving (published headpiece). On Guerlac's account, however, we do not have access to the sketch mentioned in the correspondence of 17 April, i.e. Arlaud's sketch that Newton approved. Hauptman substantiates his account by claiming that the Latin inscription on the diagram '*Nec variat lux fracta colorem*' is allegedly written in Arlaud's hand. The text on the back of the diagram sheet referring to Newton's handwriting is then understood as referring to the New College sketch.[82] However, these arguments are unconvincing. The hand in which the Latin motto is written is remarkably similar to Newton's from the original sketch, with minor discrepancies explained by the fact that the author wanted to improve readability. Furthermore, I fail to see how the text on the back relates to the original diagram as it quite blatantly reads: 'This description was made by the very own hand of the illustrious mister Sir Isaac Newton."[83] If we are to trust this inscription, we need to know who wrote it. The library of Geneva and Guerlac claim it was written by Arlaud himself. If this is the case—and I have not been able to compare with Arlaud's other writings—then Newton drew the diagram. Additional evidence for this conclusion is found on the diagram. First, the Geneva diagram does not seem to contain any drawings that require skills that Newton did not possess. It is merely a neater version of the New College sketch, in which the main difference was the use of a ruler and concern for three-dimensional perspective. The parts that were drawn freehand, such as the round bases of the

[80] The second sentence was clearly written with a different pen.

[81] Guerlac, *Newton on the Continent*, pp. 157–9. Avery infers that the folio containing the prism diagram was probably first used by Newton to draft a letter ("A chain of invisible reasoning"?; see 'Sr Theodore' on NCO, MS 361/2, f. 45r). If correct, then this would mean Newton sent this sketch to Varignon with a piece of correspondence and perhaps other jottings on the folio. This is another piece of circumstantial evidence that strengthens the claim that Newton would not have sent this folio to Arlaud. Still, this is not conclusive evidence.

[82] Hauptman, 'Arlaud and Newton's "*Experimentum Crucis*"', 7–8.

[83] 'Description' in the early modern period often referred to a representation in art or a picture.

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equipment and the spectrum projected onto the second board, are remarkably similar to the those in the original.

Although this inference is rather ambiguous, there is yet another feature of the diagram that supports my claim. The main geometrical difference between the beams of light in the New College and Geneva sketch, is the way the light leaves the second prism. Whereas the light travels parallel after the second refraction in the New College sketch, it diverges again in the Geneva sketch. This is a significant difference. The ability to isolate light rays with the same angle of refraction that travel parallel to each other once refracted, was part of the reason the original *experimentum crucis* provided 'irrefutable' proof of Newton's new theory of light and colours. Isolating the primary rays of light that do not change angle of refraction nor colour after any number of refractions was paramount to the crucial experiment. By admitting that light still diverges after the second refraction, in a setup like that of the original *experimentum crucis*, he also admits that light rays cannot be completely isolated or separated. This is an important concession and one that may even have forced Newton to downgrade the priority or significance of the crucial experiment. It would therefore be strange that Arlaud was the one to change this essential feature of the diagram without Newton commenting on it. Rather, it seems more plausible that Newton himself changed this crucial element in the Geneva sketch that Arlaud simply copied in a later version.[84] Therefore, I concur with Guerlac that the Geneva sketch was drawn by Newton and sent to Arlaud to be redrawn.

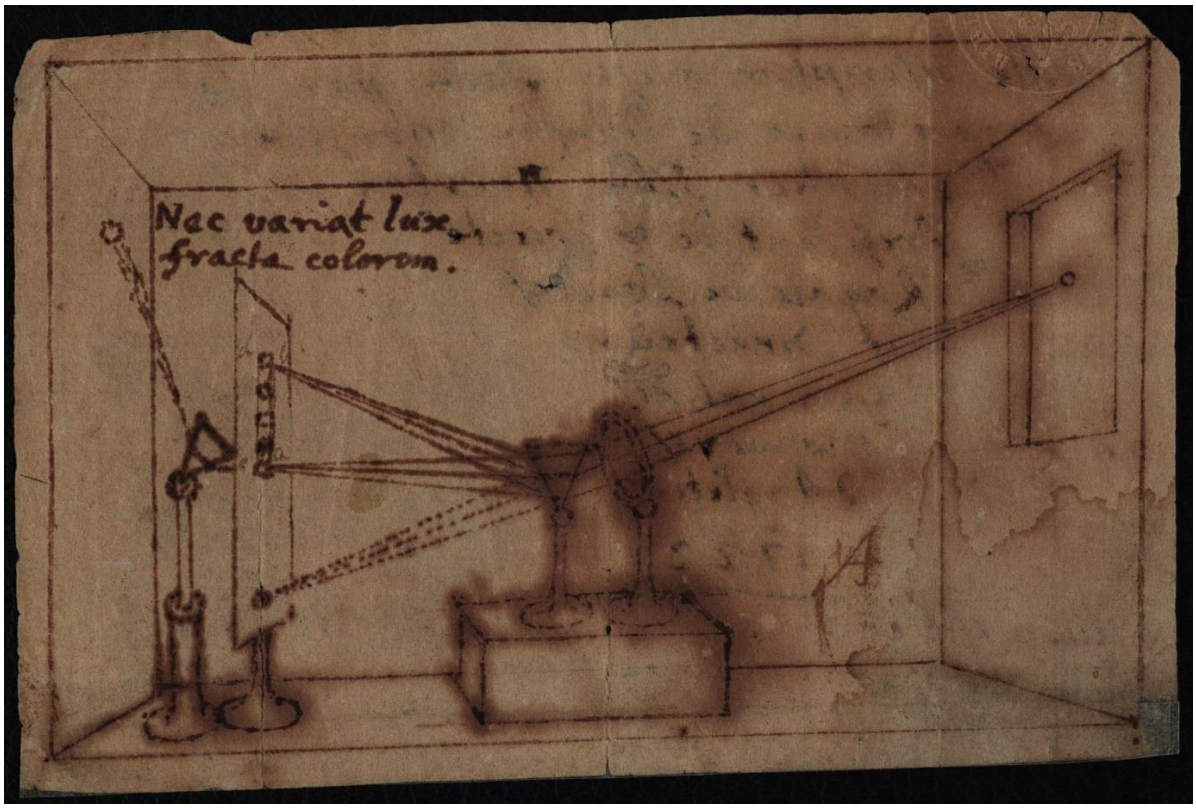

Diagram page (recto), Jacques-Antoine Arlaud, 1722, D.O. autogr. 32/67

[84] The light rays travelling parallel after the second refraction was a feature of the original 1672 *experimentum crucis* but was not retained in the same experiment from the 1704 *Opticks*. Why Newton would have considered adding a parallel beam of light after the second refraction in 1722 is unclear. Lohne, unaware of the existence of the Geneva sketch, notes that Arlaud was the one who changed this feature of the beam of light after the second refraction ('*Experimentum Crucis*', 194).

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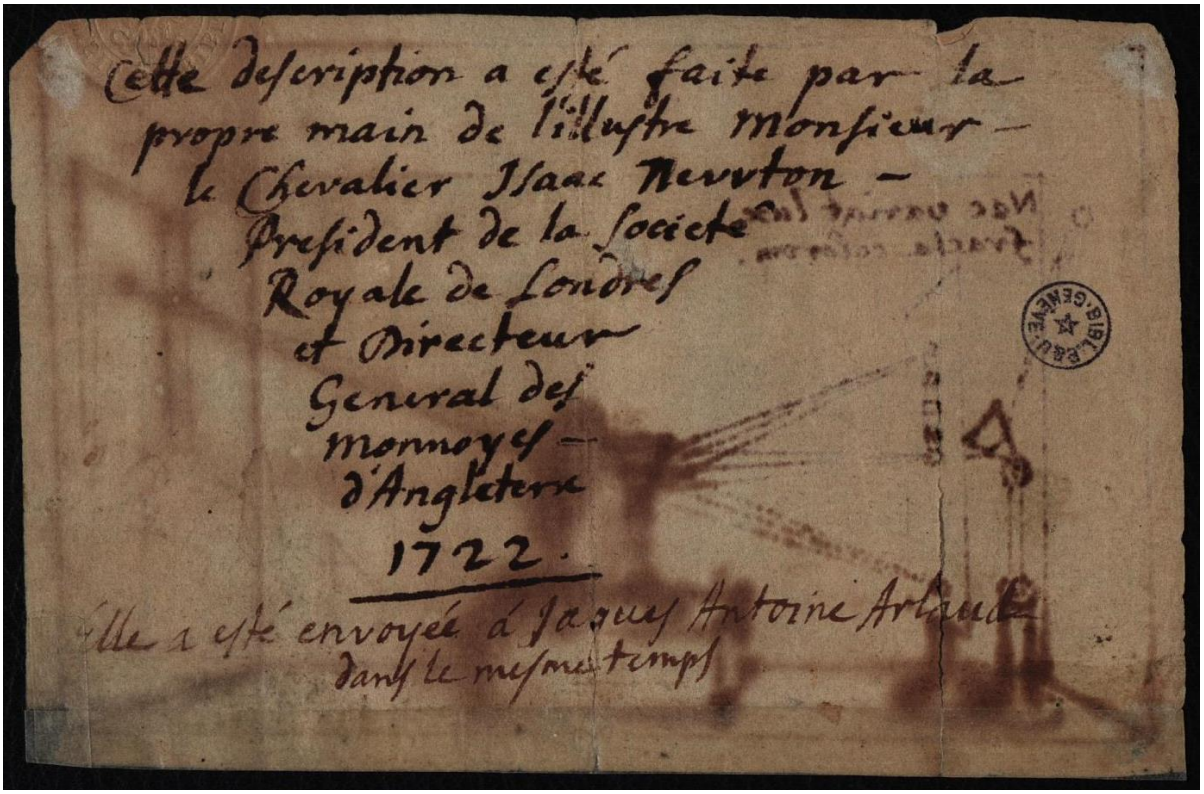

Diagram page (verso), Jacques-Antoine Arlaud, 1722, D.O. autogr. 32/67
© Courtesy of the Bibliothèque de Genève

Although the finished headpiece looks vastly different from the earlier sketches, Arlaud masterfully copied all the scientifically relevant details. He even went as far as to copy 'errors' by making the red rays converge earlier than the violet rays on the board between the first and second prism.[85] Thus, Arlaud's changes concerned the aesthetics of the piece, making it seem real rather than abstract. All the instruments are fixed on elaborate stands, the ceiling consists of wooden beams, the floor is tiled, and the entire room is darkened to approximate the atmosphere of performing the actual experiment. For the realisation of the engraved headpieces for the *Traité d'Optique*, Arlaud enlisted the services of the draughtsman Jean Chaufourier (1675–1757) and the engraver Antoine Herisset (1685–1769).[86] Both their names appear below the printed headpiece. In contrast, Arlaud, as supervisor of the project, received no official recognition for his involvement in the realisation of the *vignette*. Nevertheless, Newton in personal correspondence dated 22 October 1722 does express his gratitude for Arlaud's contributions:

> I owe you the greatest thanks because you have corrected the diagram of the experiment in which light is separated into its primitive and immutable colours, and have made it far more elegant than before. But you also greatly obliged me when you took care that that diagram, engraved upon a copper plate and worn out in the course of printing, was repaired, so that the impression of the book was rendered more elegant. And thus I offer you the greatest thanks I can. I am exceedingly delighted that the things which I have discovered about the nature of light and colours do not displease those great men, the Cardinal Polignac and the Abbé Bignon. Would that these things may please your countrymen no less than your most elegant and perfectly drawn picture pleased mine![87]

[85] Lohne, '*Experimentum Crucis*', 194. Also, see infra.
[86] See Guerlac, *Newton on the Continent*, pp. 159–160; Hauptman, 'Arlaud and Newton's "*Experimentum Crucis*"', 8; Lohne, '*Experimentum Crucis*', 194.
[87] Hall and Tilling, *Correspondence*, p. 213; translation by the editors.

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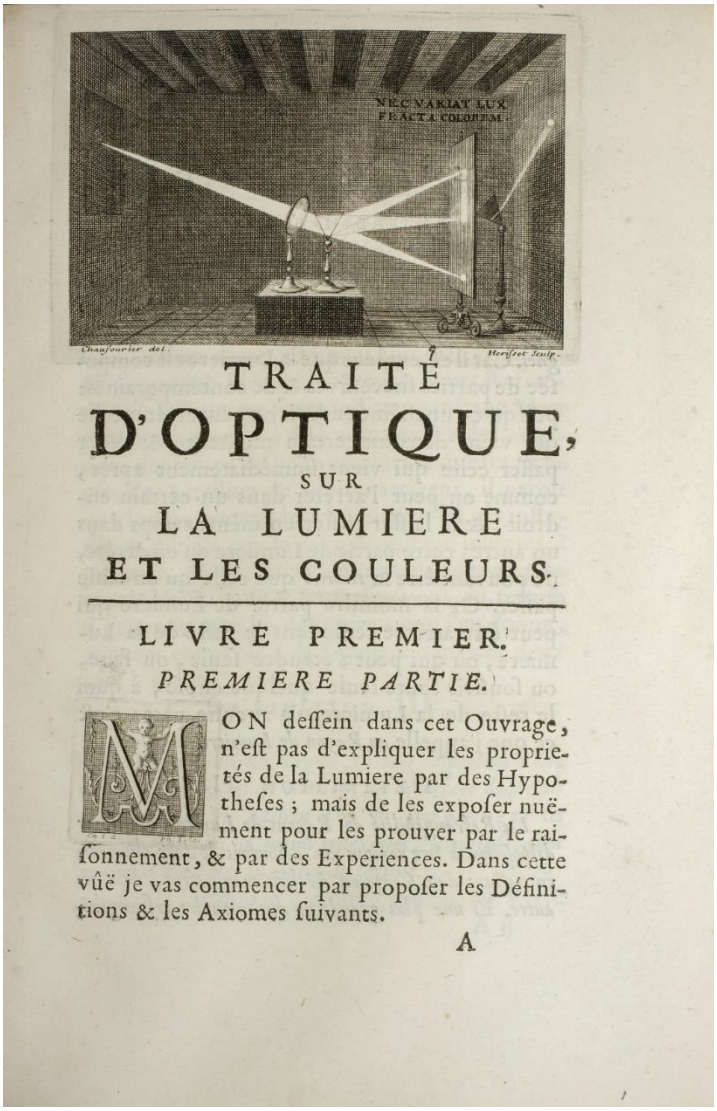
Earlier, on 14 September 1722, Newton gifted a copy of the *Traité d'Optique* to Arlaud via Varignon.[88] Arlaud confirmed the receipt of this 'most precious gift' on 10 October, claiming that the 'book wins great fame among the truly learned'.[89]

So, we know that Newton sketched the New College diagram between September and December 1721. Returning to the discussion of the *experimentum crucis*, it is curious that Newton did not prioritize this particular experiment in all of his writings ensuing the 1672 'New Theory', only to return to this very similar experiment in 1721 for the headpiece of the *Traité d'Optique*. This might indicate that Newton still assigned some priority to the experiment, although he could no longer afford to do so publicly after the 1672 paper and the subsequent criticism.


NEC VARIAT LUX
FRACTA COLOREM.

Chauſſourier del. Heriſſet Sculp.

TRAITÉ
D'OPTIQUE,
SUR
LA LUMIERE
ET LES COULEURS.

LIVRE PREMIER.

PREMIERE PARTIE.

MON deſſein dans cet Ouvrage, n'eſt pas d'expliquer les proprietés de la Lumiere par des Hypotheſes ; mais de les expoſer nuëment pour les prouver par le raiſonnement, & par des Experiences. Dans cette vûë je vas commencer par propoſer les Définitions & les Axiomes ſuivants.

A

Vignette page, Newton, *Traité d'Optique* (Paris: Montalant, 1722), p. 1
© Courtesy of the Göttingen State and University Library, 4 PHYS III, 2209

[88] The copy is currently kept at the library of Geneva and contains the following inscription: 'Ce livre a esté donné par l'illustre Autheur Monsieur le Chevalier Newton President de la Société Royale de Londres, et Directeur General de la monnoye d'Angleterre à Jacques Antoine Arlaud Citoyen de Genève par les mains de monsieur Varignon Professor en mathematique au College Royal. A Paris le 14eme September 1722 [This book was given by the illustrious author mister Sir Isaac Newton, president of the Royal Society of London, and director general of the Mint of England, to Jacques Antoine Arlaud, citizen of Geneva, by the hands of mister Varignon, professor in mathematics at the Royal College. In Paris on 14 September 1722.]' (Guerlac, *Newton on the Continent*, p. 162; translation is my own). Hauptman ('Arlaud and Newton's "*Experimentum Crucis*"', 9) also discusses Arlaud's copy of the *Traité d'Optique*.

[89] A. Rupert Hall, 'Further Newton Correspondence', *Notes and Records* 37 (1) (1982), 7–34, at p. 29.

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Conclusion

The New College manuscripts constitute a rich collection of Newton's pursuits in the last decades of his life. They paint the picture of a man, on the one hand, diligently studying ancient chronology and, on the other hand, deeply rooted in London metropolitan life as Master of the Mint and President of the Royal Society. In this article I have explained how this remarkable set of manuscripts came into being and eventually came into the possession of New College. By questioning the provenance of the entire archive and the set of manuscripts now in the hands of New College, I hope to have shed some light on the blind spots in the standard narratives. First, it is difficult to imagine what Newton did not want to leave for posterity, given what was *actually* preserved. I have tried to gather as much of the secondary literature on Newton's supposed act of burning parts of his archive and the primary literature they marshal at its forefront. I hope that this descriptive approach will allow the reader to draw their own conclusions on this issue. Second, I provided a new account of the provenance of the set of manuscripts now kept at New College. I believe my account fits almost all the available evidence and testimonies, or at least the reliable testimonies of the protagonists in this episode, such as Ekins (1699–1773). He actually received the manuscripts from Chalmers and is therefore (presumably) a more credible source than his descendants, for example. The main feature of my account is that it assigns a crucial role to Chalmers and relegates Sykes to the periphery. As executor of Catherine's will, Chalmers possessed some of the manuscripts to be sent to Sykes. For unknown reasons, Chalmers kept these manuscripts until his death in 1745, rather than comply with Catherine's wishes. Subsequently, the manuscripts found their way to Ekins. Sykes's role is thus limited to being the recipient of some manuscripts that Catherine wanted published.

Additionally, I laid out the story behind the famous prism diagram found in the New College collection. Although its history is well documented in the scholarship, there are still some caveats in our knowledge that I have pointed out. In short, I have related the rudimentary diagram from New College to a more advanced version in the library of Geneva, which was eventually redrawn and engraved in the 1722 French edition of the *Opticks*. In addition to the historical significance of uncovering the origins of the diagram, I have shown why it is also of scientific interest. The question of whether Newton himself changed the beam of light from parallel to divergent after the second refraction is non-trivial—if, of course, this was not merely a lack of artistic abilities. It could even be interpreted as a concession to the ability of the crucial experiment to prove his theory of light and colours, which explains the disappearance of something like a 'crucial experiment' in Newton's later work. Although all commentators assume the identity between the *experimentum crucis* and the New College sketch, I have tried to show that there is reason to doubt whether this is still the *same* experiment from 1672.

Although the New College collection has a very idiosyncratic history, I still believe that broader lessons can be drawn from it about the impact of an archive on scholarship.

First, the issue of availability. Because of the choices of the various historical agents, the archive is split up as it is. This makes consulting the entire archive or even the part of the archive on a particular subject a logistical issue. This issue has been circumvented in recent years by the ongoing effort of The Newton Project, which aims to make Newton's published and unpublished writings available to the public. Additionally, many libraries have digitized their collections and made them freely available on their websites. But despite these major efforts to make Newton's archive whole again and achieve its long-lost unity, the curators' choices have had major implications.

This brings me to my *second* point. Almost the entire archive is sorted thematically. The scientific papers are kept in Cambridge, many of the theological papers are kept in Israel, and so on. These choices reflect the specific disciplinary boundaries of the time. For instance, the collection kept in Cambridge reflects what was considered 'scientific' according to the Cambridge cataloguers between 1872 and 1888, and perhaps more importantly, what was *not*. Note that it is

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always anachronistic to designate anything in Newton's *oeuvre* as 'scientific' because no 'rigid' discipline of science was established yet. In other words, the current state of the archive provides insight not only into Newton, but also into the life, times, and beliefs of the curators. The New College papers are clearly on the 'unscientific' side of the divide and—as Jack Avery succinctly puts it—'their contents were increasingly seen as an embarrassment'.[90] Because of the historical disciplinary boundaries and the fact that Newton's archive does not lend itself well to rigid categorisation, it is inevitable that when the papers are sorted, some parts of the folios will take precedence over others. That is why, for example, some drafts for the *Principia* or *Opticks* remained hidden for centuries between the bulk of chronology related manuscripts. These categorisations affect how people read the various collections and thus what is foregrounded and backgrounded. The New College collection is an interesting case in this respect because it was not examined by the Cambridge cataloguers but was selected much earlier by Catherine Conduitt. Her judgement on what was worth printing from Newton's unpublished writings, and then Chalmers' decision to adopt part of Catherine's list, were crystallised in the New College collection. We must be aware of the fact that this categorisation puts certain topics in the foreground and others in the background. I hope this article is a starting point for researchers seeking further clarity on the choices that led to the New College collection. The main remaining questions are: why did Catherine saw these particular manuscripts fit to be sent to Sykes in the first place? Why did Chalmers, as executor of her will, not respect Catherine's wishes and instead retain some of the manuscripts described in the codicil?

I am convinced that the study of these historical contingencies is of the utmost importance for Newton scholarship in general. As a deeply historical discipline, Newton scholarship is influenced by the disciplinary configuration of the archive, on the one hand, and the particular concerns of historians and philosophers on the other. Both factors are inherently historical. Acknowledging this historicity can provide valuable resources to explain *why* and *how* Newton scholarship looks the way it does in the twenty-first century.

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[90] Avery, "'A chain of invincible reasoning'?'.

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