Prophecy, History and Method

How and why Isaac Newton studied Chronology



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Abstracts

Short abstract

Isaac Newton spent forty years of his life studying the chronology of ancient civilizations. The manuscript record that bears the fruits of these writings is in significant disarray, which has led to many misinformed conclusions about the nature of his research and his motivations for studying the topic in the first place. By devoting ample attention to Newton's reading, note-taking, writing, and ordering practices, this thesis makes use both of evidence drawn from Newton's surviving books and of Newton's digitised manuscripts and transcriptions to reconstruct the evolution of his chronological writings. Originally just an eight-page treatise on the origins of idolatry, 'Theologiae Gentilis Origines Philosphicae' (mid-1680s), Newton started expanding and revising it to eventually arrive at the posthumously published *Chronology of Ancient Kingdoms Amended* (1728). I show that most of the writings he composed in the interval were all part of a single treatise, the 'Originals' (1702–06), in which he built on his original research.

In truth, Newton's chronological studies began even before the 'Origines', with his studies of the prophecies in the books of Daniel and Revelation. In order to correctly identify the four monarchies from Daniel and their role in past, present, and future, he needed a reliable timeframe. From Greek and Roman sources he derived a timeline of the kings that reigned over Babylon during the Jewish Exile, which he subsequently collated with the Scriptural record, not shunning to amend the chronological books of Ezra and Nehemiah where necessary. With the "Origines'' and 'Originals', Newton constructed a timeframe from Greek history using methods from genealogy and astronomy that allowed him to incorporate all of sacred and profane history. Posthumous editorial projects and the scattered manuscript record have obscured much of the connections between Newton's chronological and prophetic writings, yet for Newton they were part of one and the same project.

Long abstract

When Isaac Newton (b. 1642) passed away in March 1727, the scholarly world eagerly awaited the posthumous publication of the work that had kept him occupied during the last years of his life. That work was *not* a work of mathematics or natural philosophy, but instead a detailed study of ancient chronology. In the *Chronology of Ancient Kingdoms Amended* (1728), which came out less than ten months after Newton had passed away, he proposed a revised chronology for the histories of Greece, Egypt, Assyria, and the other ancient Mediterranean nations, that fitted within the narrow timespan allowed for by the Masoretic version of Scripture. In his calculations, he had arrived at much later dates than commonly accepted for pivotal historical events such as the Fall of Troy and the voyage of the ship Argo, using methods from genealogy and astronomy. The *Chronology* generated a massive debate among scholars, most of whom concluded that the great natural philosopher had been misguided in his interpretation of classical sources and in the techniques he employed.

Over the past decades, Newton's chronological studies have received ample attention. Yet the manuscript corpus on which these studies drew is in significant disarray, a fact insufficiently appreciated by scholars. Instead, historians have focussed on manuscripts that are seemingly coherent, treating them as separate treatises without taking into account their intricate connections with other writings. As a result, Newton's studies of chronology have been significantly misunderstood and misrepresented. In this thesis, I focus on Newton's chronological writings in their entirety, from the tiniest of scraps containing single lines to the most elaborate and apparently complete of the manuscripts. I show that the key to unlocking the secrets of his chronological studies are his working practices: his reading, note-taking, writing, and information-ordering habits. It is only through the process of understanding *what* Newton was doing that we can understand *how* and *why* he studied chronology.

Newton operated against the background of the discipline of chronology as it had emerged from the Renaissance and matured with the works of Joseph Scaliger and Dionysius Petavius.

Through the development of sophisticated linguistic techniques and robust astronomical calculations, chronologists tried to solve the problems posed by profane histories that challenged the timeline allowed for by Scripture. In particular the writings of Berosus and Manetho proved to be troublesome, as they provided seemingly genuine and reliable lists of Assyrian and Egyptian dynasties that predated the Flood. Early modern chronologists tried to solve these conflicts in various ways, most commonly by ignoring those elements of ancient history that could not easily be harmonized with *sacred history*.

That term – *sacred history* – originated with Augustine, who discussed why the history as written down in Scripture should always prevail over profane histories. In general, history did not just describe events and facts in time and space, but showed the unfolding of God's plan with mankind. The history contained in the books of Scripture was divinely inspired, as best illustrated by the four monarchies prophesied in the book of Daniel, who lived through the Jewish Exile. As Jerome had already shown, two connected series of visions, one involving a four-part statue, the other four wild animals, could directly be mapped onto world history. The four monarchies associated with these visions, understood in varying configurations to be the Assyrian, Babylonian, Medo-Persian, Macedonian or Greek, and Roman Empires, had to be a template for all world histories. Interpreters assumed that there were no monarchies of meaningful size before the Assyrian, and their accounts had to agree with the history in Scripture. Moreover, it was believed that these visions did not just describe the past and present but were also related to the Day of Judgment, with the revelation of Antichrist and the second coming of the true Christ. The framework of the four monarchies remained a staple throughout Medieval and Renaissance chronology. In particular Reformation historians like Johann Sleidan and Philipp Melanchthon used it to establish Protestantism as the continuation of the true Church, with Roman Catholicism and the Holy Roman Empire the still living embodiment of the fourth animal through the principle of *translatio imperii*. Though not all went as far as to identify Antichrist with the Pope, the signs of the times were read in the context of the apocalyptic visions presented in Daniel and the book of Revelation. Yet in the seventeenth

century, the four monarchies disappeared from the chronological scene. Still used by theological commentators of Daniel, it no longer fitted a historical narrative in which Egypt's antiquity became more and more prominent, or which sought to include the histories of other parts of the world like India and China.

During the 1680s, Newton began working on an unnamed treatise that he reworked several times, before finally expanding it to a projected eleven-chapter work which he titled 'Theologiae Gentilis Origines Philosophicae' ('On the (Natural) Philosophical Origins of Pagan Theology'). Originally meant to show how ancient Egyptian rites and star worship contained the root of all idolatry, Newton soon incorporated in the "Origines'' the idea that all Mediterranean civilizations had their origins in Noah and his progeny, as their mythologies showed. Inspired by the works of Samuel Bochart, John Marsham, and Gerardus Vossius, he provided a detailed analysis of the various sacred and profane *dramatis personae* and their identification with one another, suggesting that the first four generations after the Flood corresponded to the Four Ages of Man described by Ovid, Hesiod, and Virgil.

By then Newton had spent years reading up on ancient chronology, both through the works of contemporary scholars and his own study of primary sources, for which he consulted the various libraries at his disposal in Cambridge. At the same time, he began amassing a huge collection of classical and contemporary sources of his own, which he expanded throughout the rest of his life, in particular after his move to London in 1696. From the reading traces in these books and his note-taking practices, it is clear that he consulted the works of his contemporaries primarily for the source materials they contained, while also inspecting many of these materials independently. From his idiosyncratic interpretations of these sources, as exemplified by the 'Origines' and in his later work, it seems he did not interact with other scholars, but instead worked from the seclusion of his study, only allowing a select audience to read his materials.

The development of Newton's chronological thought between the 'Origines' and the *Chronology* has received little attention in recent historical literature, primarily because

scholars have been unwilling to examine in sufficient detail the thousands of related but disorganised draft folios Newton left behind. Two key works, the 'Original of Religions' and the 'Original of Monarchies', are traditionally dated as composed in the early 1690s and in around 1702, respectively, and they have been discussed as independent and disjointed treatises. In the 'Original of Religions', Newton continued his studies of ancient religions and focussed primarily on the *prytaneum*, the circular temple used for both religious and political affairs. In the 'Original of Monarchies', on the other hand, he discussed the early development of kingdoms from small cities to city-states. Having reconstructed first Newton's own ordering practices, and through these the various stages in which his writings and ideas developed between the early 1690s and the middle of the 1710s, a rather different picture emerges. I show that between 1702 and 1706, Newton composed a work that in its several stages contained both the 'Original of Monarchies' and the 'Original of Religions', which were consecutive chapters in an ever expanding treatise for which I propose the title 'Originals'. In its early stages, the 'Originals' was primarily a continuation of the work he began with the 'Origines', with a growing emphasis on the chronology of Egypt and how the writings of Manetho should be understood. Instead of shifting focus from religion to monarchies, he kept the two topics closely connected.

In the later versions of the 'Originals', Newton began to include arguments from astronomy. With several ancient Greek astronomers providing fairly accurate reports about the positions of the constellations, he used his understanding of precession to establish dates for these observations, thus calibrating the periods in which the various ancient astronomers had lived. Together with arguments about the average lengths of generations and reigns, he established dates for key events in Greek history that differed centuries from those accepted by his contemporaries. These arguments would form the heart of the *Chronology* which he started drafting in around 1715. Yet, as my reconstruction shows, several of the chapters in the *Chronology* were missing from the 'Originals', notably those related to the four monarchies, despite the fact that he made continuous reference to that framework in his discussion of the

origin of kingdoms. But from the inclusion of key events and dates from these chapters in the *Short Chronicle*, an abstract of his work he drew up for Princess Caroline in 1717, it seems he had made ample study of the monarchies that reigned over Babylon during the Jewish Exile.

It turned out that Newton had actually begun these studies in the decade before he started writing the 'Origines', in what at first appears a totally different setting, that of the interpretation of the prophecies in Scripture. Confronted with the visions in the book of Daniel, he began to harmonize the historical record found primarily in the books of Ezra and Nehemiah with that of Daniel, and with that of profane chronologists. Initially following the writings of Jewish historians and the Roman-Jewish Flavius Josephus, he soon discarded their flawed histories which only acknowledged the kings mentioned in Scripture, conflating the various Dariuses and Artaxerxeses with one another. Instead, he turned his gaze to Greek and Roman authors and from them reconstructed a reliable kings list, which he then used to correctly interpret the histories as related in Scripture. This led him to reconsider and eventually overturn the order in which the events were presented in Ezra and Nehemiah, suggesting that their books had not survived time unscathed. Liberally cutting and pasting, and identifying various chapters from these books as essentially relating to the same events, he finally arrived at a coherent timeline that agreed with both the profane sources he considered reliable, and with amended Scripture.

Newton defended his text-critical approach to Scripture by making clear distinction between the writings of Biblical chronologists, who reported events in history as they witnessed them and thus had limited validity, and the words of the prophets, which were directly inspired by God and thus contained factual truth by definition. He had been studying these prophecies in great detail, in particular those related to Christ's first and second coming, during the 1670s. As Newton saw it, the two related visions in Daniel, that of the statue and that of the four animals, both depicted the same historical events. As a result, the four monarchies involved were still alive through their successor states, and would play their part in the end times. Thus it was of pivotal importance to correctly identify these monarchies, which in turn necessitated

a reliable timeline, which he established through the 'Origines' and the 'Originals'. In around 1715, he began combining the results from the 'Originals' with his research on the first and second monarchies, which involved the Babylonians, the Assyrians, the Persians, and the Medians, which would eventually become the *Chronology*. The third and fourth monarchies, the Greek Empire of Alexander the Great and the Roman Empire, would then become part of a projected second volume detailing prophecy.

Newton died before any of these plans could be realized. In the last year of his life he had been frantically revising the manuscript for the *Chronology* in response to the illegal publication of a French translation and analysis of the *Short Chronicle*, in the process of which he removed many references to the four monarchies and the study of the prophecies. Newton's executor John Conduitt, together with Martin Folkes, undertook the publication of the *Chronology* while discussion about the *Short Chronicle* was still active, editing the manuscript as they saw fit. Over the next five years, they and several other scholars went through the prophecy-related materials in much the same fashion, constructing a volume that was published as *Observations upon the Prophecies of Daniel and the Apocalypse of St John* (1733). Both of these posthumously published works were as much the product of their editors as of their composer. With the *Chronology* but a single phase in Newton's writing on the topic, in order to understand what he actually meant with his chronological writings it is paramount to take into account the full scope of their genesis and evolution.

In order to do so, in this thesis I have made full use of the digital availability of many of Newton's manuscripts and the online transcriptions of the *Newton Project*. As a result, it has become clear how from the onset Newton's chronological writings were motivated entirely by his studies of the prophecies and maintained their connection with the four monarchies from Daniel. Moreover, it turned out that the chapters from the *Chronology* that discuss the history of the monarchies that ruled over Babylon during the Jewish Exile in fact originated from these studies, and that up to the final draft for the *Chronology* the connections between chronology and prophecy were evident.

Acknowledgments

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In loving memory of Asa Briggs (1921-2016)

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Abbreviations and Conventions

ANB	*American National Biography*
APS	Library of the American Philosophical Society, Philadelphia
BJHS	*British Journal for the History of Science*
BL	British Library, London
Bodleian	Bodleian Library, Oxford
Bodmer	Fondation Martin Bodmer, Geneva
BNS	J.E. Force and R.H. Popkin (eds.), *The Books of Nature and Scripture: Recent essays on natural philosophy, theology and biblical criticism in the Netherlands of Spinoza's time and the British Isles of Newton's time* (Dordrecht, 1994)
CAH	J. Boardman et al. (eds.), *The Cambridge Ancient History. Second Edition, Volume III, Part 2: The Assyrian and Babylonian Empires and other States of the Near East, from the Eighth to the Sixth Centuries B.C.* (Cambridge, 1991)
CCtN	I.B. Cohen and G.H. Smith, (eds.), *The Cambridge Companion to Newton* (Cambridge, 2002)
CCtN^2	R. Iliffe and G.E. Smith (eds.), *The Cambridge Companion to Newton* (Second edition, Cambridge, 2016)
Chron.	I. Newton, *The Chronology of Ancient Kingdoms Amended* (London, 1728)
CNI	J.E. Force and R.H. Popkin (eds.), *Newton and Religion: Context, Nature and Influence* (Dordrecht, 1999)
Correspondence	H.W. Turnbull, L. Tilling, and A.R. Hall (eds.), *The Correspondence of Isaac Newton* (7 vols., Cambridge, 1959–77)
ECNI	J.E. Force and R.H. Popkin, *Essays on the Context, Nature, and Influence of Isaac Newton's theology* (Dordrecht, 1990)
Historian	F. Manuel, *Isaac Newton, Historian* (Cambridge, 1963)
HRHRC	Harry Ransom Humanities Research Center, University of Texas, Austin
JHI	*Journal for the History of Ideas*
JWCI	*Journal of the Warburg and Courtauld Institutes*
JWL	James White Library, Andrews University, Berrien Springs, MI
KJV	*Bible, King James Version*
Library	J. Harrison, *The Library of Isaac Newton* (Cambridge, 1978)
NA	National Archives, London
NCL	*New College Library, Oxford*
Never at Rest	R.S. Westfall, *Never at Rest: A biography of Isaac Newton* (Cambridge, 1980),

NIV	*Bible, New International Version*
NRRS	*Notes and Records of the Royal Society*
Observations	I. Newton, *Observations upon the Prophecies of Daniel and the Apocalypse of St John* (London, 1733)
OCD	*Oxford Classical Dictionary*
ODNB	*Oxford Dictionary of National Biography*
Orig. of Civ.	J.Z. Buchwald and M. Feingold, *Newton and the Origin of Civilization* (Princeton, 2012)
'Originals'	Newton's continuation from the 'Origines'; ca. 1702–06
'Origines'	'Theologiae Gentilis Origines Philosophicae', Yahuda Ms. 16.2
Priest	R. Iliffe, *Priest of Nature: The Religious Worlds of Isaac Newton* (Oxford, 2017)
RS	Royal Society
TCL	Trinity College Library, Cambridge
WACL	William Andrews Clark Memorial Library, Los Angeles

Translations are mine, unless otherwise specified. Classical texts cited in the notes are referred to by their short titles as given in the *OCD* and can be found on *Perseus*; early Christian texts are likewise abbreviated and can be found on *New Advent* (both: see Digital Resources). Classical authors are named and indexed by their commonly accepted shorter names; thus Varro for Marcus Terentius Varro and Servius for Maurus Servius Honoratus, but Eusebius for Eusebius of Caesarea, unless where more clarification is needed, as in Clemens of Alexandria, to distinguish him from Clemens of Rome. Modern editions and translations are listed separately in the bibliography, alphabetic by classical author / work.

Julian calendar dates (Old Style) between and including 1 January and 24 March are given with double years, as in 15 February 1667/68, with the year dated from 1 January. Quotations are given in the original spelling, including the abbreviations y^{e} for 'the', y^{t} for 'that', w^{ch} for 'which', and w^{th} for 'with'; underlining and emphasis as in the original. *Newton Project* transcriptions are always diplomatic, unless otherwise specified. Conventional symbols are used to indicate that text has been ~~deleted~~, \inserted above the line/, |inline|, or /below the line\. Paragraph and chapter references in the main text and notes are to this thesis.

1. Past, Present, Future

1.1 Introduction

In the Fall of 1725, a French translation appeared of a short chronological work, composed by an Englishman about a decade earlier. It consisted of a short introduction followed by an extensive list of dates for key historical events. These included important episodes in the history of the Jewish people, such as the ascendency to the throne of King David in 1059 BCE, the building of the Temple under his son Solomon (1015 BCE), and the invasion of Syria and Judea by the Babylonians under Nebuchadnezzar (606 BCE). In between, pivotal events in world history were listed, such as the Argonautic Expedition (937 BCE), the Fall of Troy (904 BCE), the building of Rome (627 BCE), and the conquest of the Persian Empire by Alexander the Great (332 BCE). What was remarkable about these dates was that they differed significantly from established scholarly consensus. For example, Dionysius Petavius (1583–1652), the renowned French theologian and historian, had arrived at 1226 BCE for the voyage of Jason and the Argonauts and 1184 BCE for the Fall of Troy, putting these events almost three centuries earlier.[1] Appended to the translation, the Paris publisher Guillaume Cavalier had included a critical analysis of the chronology presented and the methods the author had used to arrive at his dates, from the hand of the renowned scholar Nicholas Fréret. According to Fréret, everything was 'très curieux', and, moreover, entirely wrong.[2] The author had misunderstood – or misinterpreted – several ancient sources, his calculations were off, and, therefore, so were his conclusions.

The author was Isaac Newton, and the appearance of a work of chronology from the hands of England's greatest natural philosopher must have surprised many of his contemporaries. After all, apart from a handful of people who were close to him, and the circle around Cavalier and

[1] D. Petavius, *Rationarium Temporum* (Paris, 1633), 36-40. See also *Orig. of Civ.*, 343.
[2] G. Cavalier and N. Fréret, *Abregé de la Chronologie de M. le Chevalier Isaac Newton, Fait par lui-meme, & traduit sur le Manuscrit Anglois* (Paris, 1725), 48.

Fréret, almost no one knew about his chronological studies. The *Short Chronicle*, translated as *Abregé de la Chronologie de M. le Chevalier Isaac Newton*, had been a summary of his studies, written for Princess Caroline in 1717 at the instigation of the Italian Abbot Antonio Conti. Conti had made Newton's acquaintance in 1715, and was impressed with his understanding of ancient history.[3] Afterwards, Newton would be less impressed with Conti's understanding of friendship, suspecting it was he who had supplied the French with a copy of his work.[4]

In a letter to the *Philosophical Transactions* in which Newton explained the provenance of the manuscript the editors had used, he included several complaints about how his work had been misunderstood by Fréret. He also stated that, contrary to the impression given by Fréret, he was not working towards the publication of any kind of chronological work. On the contrary, he made it seem as if his chronological studies had been nothing more than a hobby: 'When I lived at Cambridge, I us'd sometimes to refresh myself with history and chronology for a while, when I was weary with other studies…'[5] As the manuscript record testifies, this was at minimum a severe understatement. From the mid-1680s onwards, chronology had never been far from his mind. It is probably true that at the time the *Short Chronicle* saw the light, he was not actively working towards publication of his chronological writings – but that soon changed. During the final eighteen months of his life, Newton frantically drafted one version after another of the various chapters that would posthumously be published as the *Chronology of Ancient Kingdoms Amended* (1728). The final iteration of that work turned out be rather different from the preceding drafts, misleading both contemporary critics and modern students of his scholarship as to the purpose of his chronological writings.

[3] *Historian*, 21-23; *Orig. of Civ*., 309-12.
[4] I. Newton, 'Remarks upon the Observations Made upon a Chronological Index of Sir Isaac Newton, Translated into French by the Observator, and Publish'd at Paris', *Philosophical Transactions*, 33 (1725), 315-22, esp. 317, 320.
[5] Ibid., 320.

In this thesis I argue that Isaac Newton's chronological writings must be understood in the light of his studies of the prophecies in Scripture. The dissertation sets out to correct the image of Newton as a chronologist composing a universal history describing the origins of the main Mediterranean civilizations, harmonising profane with sacred history. Indeed, the *Chronology of Ancient Kingdoms Amended* dealt with exactly these themes, yet its complex gestation reveals a different tale. At the time Newton began reading for what would become his earliest chronological treatise, 'Theologiae Gentilis Origines Philosophicae', composed during the mid-to-late 1680s, he had been immersing himself in the studies of the prophecies in Scripture, in particular those in the books of Daniel and Revelation. In order to correctly interpret these apocalyptic visions, he had begun to unravel the histories of Assyria, Babylon, Persia and Media, which would become an integral part of the *Chronology*. In the 'Origines', which in the early 1700s developed into a much larger project, the 'Originals', he used the histories of Greece and Egypt to construct a timeframe in which to embed all of profane and sacred chronology, and serve as a basis for his prophetical hermeneutics. It was only in about 1715 that Newton finally merged on paper the two projects which in his thoughts had been connected from the very beginning. As the many drafts related to his studies of the kings who ruled over Babylon before and during the Jewish Exile show, Newton was indeed harmonizing profane with sacred history, but not by making the first subservient to the latter. Instead, he developed a literary criticism that surpassed that of his contemporaries, amending the record in Scripture wherever necessary. The *Chronology* then was Newton's final rewriting of the entire project, putting much more emphasis on the foundations of his chronological scheme and less on the connections with the prophecies in Scripture, in order to battle his French critics, but also with an eye on a second volume that dealt with the prophecies in Daniel and Revelations much more extensively.

I also argue that the only way to study Newton's chronological writings, and by extension, any of his writings, is by paying serious attention to how Newton composed them. With the manuscript corpus now in significant disarray, it is necessary to reconstruct the order in which

he originally wrote and subsequently edited his papers, before any meaningful conclusions about the development of his ideas can be drawn. This might seem obvious, yet so far no historian has attempted to unravel the maze that is Newton's chronological manuscripts, primarily on the grounds of its sheer complexity. This has led to many misconceptions about the nature of the chronological project that kept him occupied for forty years. The only way to reconstruct these writings and to understand the evolution of his thought is by paying close attention to his reading, writing, and note-taking habits. Only by studying *with* Newton can we understand *what* Newton was actually working on, and *why* it mattered so much to him.

In this chapter, I introduce the reader to what was once a thriving part of scholarship, the study of ancient chronology. I explore both its early modern heyday in the hands of scholars such as Joseph Scaliger and Dionysius Petavius, and the origin of the tradition in which they operated, which stretches back to the days of the Church Fathers. I pay particular attention to the seventeenth century religio-political climate in which chronology was studied, and its eschatological dimensions. Against this background I briefly discuss the results of Newton's chronological studies, which he began in the 1680s and would continue until his death in 1727, a more detailed account of which I will provide in the following chapters. I then turn to how these studies have been discussed in the literature so far, and the pressing problems of ordering and dating the manuscripts. I end this chapter by discussing four major questions involving the nature and structure of Newton's chronological studies and how this thesis will answer those questions.

1.2 Chronology as an early modern discipline

In 1704, the clergyman-scholar and science lecturer John Harris, FRS, included in his *Lexicon Technicum* – a dictionary of arts and sciences – a one-line description of chronology: 'Chronology, in the common sense of the word now, is the arithmetical computing of time for historical uses; so as thereby truly to date the beginnings and ends of princes reigns, the

revolutions of empires and kingdoms, battles, sieges, or any other memorable actions.' A great admirer of Newton, Harris dedicated much of his dictionary to Newton's mathematics and science, but he was evidently not interested in chronology, as this was all he had to say on the topic.[6] Ephraim Chambers' *Cyclopaedia* (1728), which would be of great influence on the editors of the *Encyclopédie* and the *Encyclopaedia Britannica*, had a little more to say about chronology, although the description remained rather concise. Chambers wrote that chronology involved knowledge of astronomy, geography, and various forms of mathematics, and their application to 'the antient monuments.' It was 'one of the eyes of history' – the other being geography – and 'serve[d] good purposes in theology.' Still, any reader unfamiliar with the discipline would be hard-pressed to figure out what it entailed from those remarks.[7]

In the 1744 revision of Harris' *Lexicon*, this time provided by an anonymous 'Society of Gentlemen', 'chronology' was listed explicitly on the front page, and its description significantly expanded, presumably as a result of the ongoing debate about Newton's publication. In the revised *Lexicon*, the interested reader would find that '[t]he great intention of chronology, is to set us right, with respect to… the exact course and order of time…' The chronologist's main instruments were 'the parts and characters of time, such as months, days, years, cycles, periods, &c. they are purely technical, and intended… to assist us in our computations.' What these computations frequently involved was aligning the different calendars used by the various ancient civilizations, whose records had emerged during the Renaissance. Most importantly, scholars tried to harmonize these calendars with the chronology provided in Scripture, to which pagan history had to be subservient. That this posed more and more

[6] J. Harris, *Lexicon Technicum: or, An Universal English Dictionary of Arts and Sciences*… (London, 1704), sig. R2^{r}. 'Mr Isaac Newton, Master of the Mint' was one of the subscribers, see sig. b4^{v}. For John Harris (c. 1666-1719), see a.o. M.C. Jacob, *The Newtonians and the English Revolution 1689-1720* (Hassocks, 1976), 145-46; L. E. Bradshaw, 'John Harris's *Lexicon technicum*', in F.A. Kafker (ed.), *Notable Encyclopedias of the Seventeenth and Eighteenth Centuries: Nine Predecessors of the Encyclopédie* (Oxford, 1981), 107-21, esp. 107-09; T.R. Russell, *The encyclopaedic dictionary in the eighteenth century: architecture, arts, and crafts* (5 vols., Aldershot, 1997), Vol. 1, 89-90; L. Stewart, 'Harris, John (c. 1666-1710), writer and lecturer on science', *ODNB*.

[7] E. Chambers, *Cyclopaedia, or, An universal dictionary of arts and sciences* (London, 1728), 214. For Chambers (1680-c. 1740) see also L.E. Bradshaw, 'Ephraim Chambers' *Cyclopaedia*', in Kafker, *Notable Encyclopedias*, 123-40.

challenges throughout the seventeenth century is best illustrated by the works of Joseph Justus Scaliger and Dionysius Petavius, two scholars who shaped the discipline as it existed in Newton's days.

1.2.1 Scaliger and the Julian Period

Scaliger's life and work have been well documented.[8] Widely considered the doyen of technical chronology, Scaliger (1540–1609) was an eminent philologist who mastered both classical and Near-Eastern languages, and greatly improved upon the techniques and knowledge that had emerged from the Renaissance. Ever since the middle of the fifteenth century, scholars had unearthed, translated, and collated important texts that had survived from antiquity, initially with only a rudimentary knowledge of Classical and Koine Greek, and Biblical Hebrew and Aramaic.[9] Scholarship in the latter near-Eastern languages emerged in the early sixteenth century, in particular through the works of Johann Reuchlin (d. 1522), which include his *De Rudimentis Hebraicis*, a Hebrew Lexicon and Grammar.[10] Armed with a deep understanding of these languages, Scaliger had turned his attention to the analysis of ancient calendars and how to make these agree with one another, resulting in his *Opus Novum de Emendatione Temporum* (1583).[11] This involved a careful study of the various methods of

[8] A. Grafton, 'Joseph Scaliger and Historical Chronology: The Rise and Fall of a Discipline', *History and Theory*, 14 (1975), 156-85; id., *Joseph Scaliger: a study in the history of classical scholarship* (2 vols, Oxford, 1983-93).

[9] Scholarship on the topic is vast, but see M. Landfester (ed.), *The reception of antiquity in Renaissance humanism* (Leiden, 2017) for a comprehensive treatment. See also R. Weiss, *The Renaissance discovery of classical antiquity* (Oxford, 1969).

[10] J. Reuchlin, *De rudimentis Hebraicis* (Pforzheim, 1506). For the development of Hebrew scholarship and textual criticism during the sixteenth and seventeenth century, see also R.A. Muller, 'The debate over the vowel points and the crisis in orthodox hermeneutics', *Journal of Medieval and Renaissance Studies*, 10 (1980), 53-72; M.H. Goshen-Gottstein, 'The Textual Criticism of the Old Testament: Rise, Decline, Rebirth', *Journal of Biblical Literature*, 102 (1983), 365-99, esp. 367-75;
J. Friedman, 'The Myth of Jewish Antiquity: New Christians and Christian Hebraica in Early Modern Europe', in R.H. Popkin and G.M. Weiner (eds.), *Jewish Christians and Christian Jews from the Renaissance to the Enlightenment* (Dordrecht, 1994), 35-55; A. Grafton and J. Weinberg, *'I have always loved the holy tongue': Isaac Casaubon, the Jews, and a forgotten chapter in Renaissance scholarship* (Cambridge, MA, and London, 2011).

[11] A. Grafton, 'From De die natali to De emendatione temporum: The Origins and Setting of Scaliger's Chronology', *JWCI*, 48 (1985), 100-43.

determining years and regnal periods employed by ancient timekeepers, as some would use solar years, others lunar years, and yet others a combination thereof.

In order to calibrate and compare these calendars, Scaliger had devised a universal Julian Period, a cycle of 7980 'Julian' years, the product of the 28-year Solar Cycle, the 19-year Lunar Cycle, and the so called Cycle of Indiction, a 15-year land tax cycle introduced by the Romans.[12] As a starting point, he chose 4713 BCE, when all cycles would have been in their first year, with the creation of the world happening in 3949 BCE, and thus in 765 JP, or An. Jul.[13] Not to be confused with the Julian calendar established by Julius Caesar, the Julian cycle allowed Scaliger to assign common dates to all major historical events, like the Flood, the Fall of Troy, and the finishing of Solomon's Temple. It also allowed him to demarcate the beginning of various eras, such as that of Nabonassar, who ruled over Babylon from 747 until 734 BCE. This was important for more than one reason. The second century BCE Greek historian and astronomer Claudius Ptolemy had preserved a canon of ancient kings dating back to the first year Anno Nabonassar, including the Kings of Babylon from 747 BCE, those of Persia from 539 BCE – when they conquered Babylon – and the various Macedonian and Ptolemaic rulers that followed, thereby forming one of the most important chronological documents available.[14] It was only after he had published *De Emendatione Temporum* that Scaliger rediscovered Ptolemy's *Canon*, part of the so-called *Handy Tables*, amongst the writings of the Byzantine scholar Syncellus or Synkellos (d. after 810).[15]

One work of Ptolemy that had been known since the earliest days of Renaissance chronology was the *Almagest*, which had come to Europe via two different routes. First, in 1175, via a translation of the Arabic, into which it had been translated in the eighth and ninth centuries,

[12] See Grafton, 'Rise and Fall', 160-64.
[13] For an overview of the eras in *De Emendatione*, see Grafton, *Joseph Scaliger*, Vol. 2, 277-98.
[14] J.A. Brinkman, 'Babylonia in the shadow of Assyria (747-626 B.C.)', in *CAH*, 1-70, esp. 66; L. Depuydt, "More Valuable than All Gold': Ptolemy's Royal Canon and Babylonian Chronology', *Journal of Cuneiform Studies*, 47 (1995), 97-117. The *Canon* was continued after Ptolemy's death, including the Roman and Byzantine Emperors, and in some versions runs until the fall of Constantinople in 1453.
[15] For Syncellus, see W. Adler and P. Tuffin (eds), *The Chronography of George Synkellos* (Oxford, 2002).

and then again via the resurfacing of Byzantine Greek versions in the fifteenth century. Although the *Almagest* was at its heart an astronomical treatise, presenting an intricate geocentric model of the cosmos, its observations and recordings of eclipses contained much value for the chronologist.[16] The occurrence of an eclipse, with its attached religious connotations, was of such great importance that ancient astronomers all over the world observed it in great detail, and recorded their findings. Moreover, these eclipses would find their way into annals and histories, and thus served as demarcation points for the early modern chronologist comparing and connecting the various ancient Mediterranean civilizations.[17]

Scaliger was not the first to provide a detailed analysis of the ancient calendars in use, but his methods were far more sophisticated than those of earlier scholars. He was the first to provide dates for all the important epochs and events in history. Likewise, his predecessors had often made various all too liberal interpretations in identifying historical figures with one another, had sometimes wrongly attributed texts to particular authors, and, in some cases, committed blatant forgery. For example, Scaliger discovered that an entire body of texts attributed to ancient historians like Berosus, Manetho, and Metasthenes, were in fact composed by the Renaissance scholar Annius of Viterbo. Although suspicions about these works abounded, and the histories they presented ran counter to those of Herodotus and Flavius Josephus, sixteenth century chronologists still incorporated them in their writings. Annius' forgeries were intricate, providing plausible genealogies and ample evidence.[18] Scaliger however was able

[16] G.J. Toomer (ed. and trans.), *Ptolemy's Almagest* (London, 1984), Book VI, 275-320.

[17] See A. Grafton and N.M. Swerdlow, 'Technical chronology and astrological history in Varro, Censorinus and others', in *Classical Quarterly* 35 (1985), 454-65; A. Grafton, 'Some Uses of Eclipses in Early Modern Chronology', *JHI*, 64 (2003), 213-29.

[18] C.R. Ligota, 'Annius of Viterbo and Historical Method', *JWCI*, 50 (1987), 44-56; A. Grafton, *Forgers and Critics: Creativity and Duplicity in Western Scholarship* (Princeton, 1990), 28, 36-68, 100-15; id., *Defenders of the text: The traditions of scholarship in an age of science, 1450-1800* (Cambridge, MA, 1991), 76-103; W. Stephens, 'From Berossos to Berosus Chaldaeus: The Forgeries of Annius of Viterbo and Their Fortune', in J. Haubold et al. (eds.), *The World of Berossos* (Wiesbaden, 2013), 277-89; C.P.E. Nothaft, 'The Early History of Man and the Uses of Diodorus in Renaissance Scholarship: From Annius of Viterbo to Johannes Boemus', in A. Blair and A.-S. Goeing, *For the Sake of Learning. Essays in Honor of Anthony Grafton* (2 vols., Leiden and Boston, 2016), Vol. 2, 711-28, esp. 714-19, and the references in 714 n. 8.

to prove the fraud beyond all doubt, primarily using a principle of historical proximity: those sources were to be preferred that were closest in time to the events they reported.[19]

In his later *Thesaurus Temporum* (1606), Scaliger discussed fragments of the real Berosus and the real Manetho, a third century BCE Egyptian priest and historian, which he also had found in the works of Syncellus.[20] Manetho's list of Egyptian kings proved to be quite a chronological challenge. In his *Ægyptiaca*, which had survived in fragments through the works of historians like Julius Africanus and Eusebius of Caesarea, Manetho presented details of thirty-one dynasties who ruled over Egypt until it was conquered by Alexander the Great. In Africanus' list, generally seen as the more reliable because it predated Eusebius's *Chronicle* by a century, these dynasties added up to almost 5,400 years, while in Eusebius the total was about 4,400 years.[21] Both figures were problematic, for they did not fit into the space allowed for by the Masoretic timeline presented in Scriptures. The key event here was not Creation, generally put around 4000 BCE and by Scaliger set in 3949 BCE, but Noah's flood, which Scaliger had dated to 2294 BCE.[22] No ancient civilization could be older than the Flood, yet Manetho's lists put the earliest Egyptian dynasties much further back in time. Even the inflated timeline presented by the *Septuagint*, which included much longer timespans for the antediluvian ancestors of Abraham and was followed by Josephus, could not accommodate for these dynasties.[23] However, apart from this major discrepancy, Scaliger considered the lists entirely trustworthy, and thus resorted to an unusual solution. He introduced an entire

[19] Grafton, 'Rise and Fall', 166.
[20] Ibid., 170-73.
[21] I.S. Moyer, *Egypt and the limits of Hellenism* (Cambridge, 2011), 84-141. See also W.G. Waddell, *Manetho* (Cambridge, MA, and London, 1940); A.A. Mosshammer, *The Chronicle of Eusebius and Greek chronographic tradition* (Lewisburg, PA, 1979).
[22] J.J. Scaliger, *Thesaurus temporum...* (Leiden, 1606), 'Canonum Isagogicorum', 274; Grafton, 'Rise and Fall', 171; C.A. Patrides, 'Renaissance Estimates of the Year of Creation', *Huntington Library Quarterly*, 26 (1963), 315-22.
[23] Flavius Josephus, *Jewish Antiquities*, 1.6.5. The relevant chapter is Genesis 11, where all but one of the figures in the Septuagint text have an additional one hundred years; thus verse 14: 'Καὶ ἔζησε Σαλὰ ἑκατὸν τριάκοντα ἔτη καὶ ἐγέννησε τὸν Ἔβερ', 'And Shelah lived one hundred thirty years and became the father of Eber'; the Masoretic text has thirty years. There are other differences, most notably the insertion in the Septuagint of Cainan or Kenan in Gen.12:12.

Julian period before the first one, which was taken up with what he called 'proleptic time', in contrast to 'historic time', following the Mosaic computation. It is unclear whether he considered proleptic time to be a purely hypothetical device, or a way of solving chronological issues without having to explicitly denounce the chronology found in Scripture.[24] The tensions were clear, the solution less so.

1.2.2 Petavius and seventeenth century developments

Scaliger's solution to the problems posed by Manetho's list did not find universal acclaim. Dionysius Petavius (1583–1652), historian and theologian, argued firmly against the idea of proleptic time.[25] If Manetho's dynasties stretched beyond the timeframe allowed for by Scripture, it could only mean that the kings list was unreliable. In his *Opus de Doctrina Temporum* (1627), he dismissed Scaliger's solution and ignored Manetho entirely. Petavius' works enjoyed great popularity throughout the seventeenth century, with a summary edition of the *Doctrina*, titled *Rationarium Temporum* (1633) translated into English, French, and Italian, and reprinted several times.[26] Although he was often critical of Scaliger – to the extent that several editors of both their works felt obliged to include an apology – Petavius did adopt his Julian Period, but also included years Ante Christi and Anno Domini. Compared with Scaliger's *De Emendatione* and his own *Doctrina*, the *Rationarum* provided a still detailed overview of ancient chronology that moreover fitted the Scriptural record.

Throughout the seventeenth century, interest in the ancient world greatly increased. In 1627, Thomas Arundel, the 21st Earl of Arundel, had brought to England two marble steles inscribed with a Greek chronology.[27] The text was subsequently transcribed and commented on by John

[24] Grafton, 'Rise and Fall', 172-73; D. Levitin, *Ancient wisdom in the age of the New Science: histories of philosophy in England, c. 1640-1700* (Cambridge, 2015), 157-58.
[25] For a concise treatment of Petavius' chronological methods, see P. di Rosa, 'Denis Petau e la chronologia', *Archivum Historicum Societatis Iesu*, 29 (1960), 3-54. For Petavius as theologian and 'Vater der Dogmengeschichte', see L. Karrer, *Die Historisch-Positive Methode des Theologen Dionysius Petavius* (München, 1970).
[26] Karrer, *Methode*, 8-9.
[27] G. Parry, *The Trophies of Time: English Antiquarians of the Seventeenth Century* (Oxford, 1995), 126-29.

Selden in his *Marmora Arundelliana, sive Saxa Graeca incisa* of 1629. The chronology presented on the Marble, which dealt with Greek history from 1582 to 355 BCE, for the first time allowed scholars to establish a reliable Greek chronology; moreover, one that could be synchronised with events recorded in Scripture.[28] In England, the study of artefacts and monuments, antiquarianism, had emerged from the late Renaissance and culminated in William Camden's *Britannia* (1586). A systematic survey of the material remains of Britain's Roman past, it was considered a foundational text in archaeology, the discipline that would develop in the seventeenth century with the excavations of sites such as Stonehenge.[29] Athanasius Kircher's *Oedipus Ægyptiacus* (1652–54) and John Spencer's *De legibus Hebraeorum* (1683–85) highlighted another line of interest, that of the ancient mysteries and wisdom of Egypt. Spencer's work was particularly provocative, for it suggested that the Jews had taken some of their religious rituals from the Egyptians, and not the other way round, thus directly implying the pagan origins of what would become Christian rites.[30]

Still, Manetho's list of kings, and Egyptian history in general, lingered in the background of seventeenth century historiography. Scholars like Gerardus Vossius argued that the thirty-one dynasties should not all be understood as occurring consecutively, but that several of them had reigned simultaneously over parts of Egypt.[31] After all, Manetho referred to some of them as kings of Memphis, others as kings of Elephantine, Heracleopolis, Thebes, Diospolis, Tanis, and other regions. In his *Chronicus Canon Ægypticus, Ebraicus, Graecus*… of 1672, John

[28] G.J. Toomer, *John Selden: A life in Scholarship* (2 vols., Oxford, 2009), Vol. 1, 360-387.
[29] W. H. Herendeen, *William Camden: A life in context* (Woodbridge, 2007), esp. 243-349; E. Yale, *Sociable knowledge: natural history and the nation in early modern Britain* (Philadelphia, 2016). See also D.B. Haycock, *William Stukeley: science, religion, and archaeology in eighteenth-century England* (Woodbridge, 2002). Dated, but still relevant is A. Momigliano, 'Ancient History and the Antiquarian', *JWCI*, 13 (1950), 285-315.
[30] P. Findlen (ed.), *Athanasius Kircher: The Last Man Who Knew Everything* (London and New York, 2004); D. Levitin, 'From Sacred History to the History of Religion: Paganism, Judaism, and Christianity in European Historiography from Reformation to 'Enlightenment'', *The Historical Journal*, 55 (2012), 1117-60, esp. 1136-37; id., 'John Spencer's *De legibus Hebraeorum* (1683–85) and 'Enlightened' Sacred History: A New Interpretation', *JWCI*, 76 (2013), 49–92; see also id., *Ancient Wisdom*, 154-80 and *passim*; J.A.I. Champion, *The Pillars of Priestcraft Shaken: The Church of England and its Enemies, 1660-1730* (Cambridge, 1992), 154-58; *Priest*, 198-99.
[31] G. Vossius, *De Theologiae Gentili et Physiologia Christiana, sive de Origine ac Progressu Idolatriae...* (Amsterdam, 1641), 206-12.

Marsham adopted Vossius' suggestion, going to great lengths to establish synchronisms, parallels, between the dynasties found in the various existing versions of the kings list and in other sources.[32] When two dynasties were sufficiently similar in the names of their kings and the years of their reign, they might refer to the same set of rulers. In order to make his synchronisms fit, he had to identify the last pharaoh who ruled over all of Egypt, Sesostris, with the Biblical Sesak, an identification that proved rather controversial. Indeed, all of Manetho's dynasties now fitted Scriptural chronology, but only barely, which implied that Egypt must have become a major civilization soon after the flood. Yet the dates assigned to Sesostris and Sesak differed significantly: chronologists like James Ussher placed Sesostris' reign around the fifteenth century BCE, following Eusebius' chronology, while Sesak lived around the time of Rehoboam, the son of Solomon, near the beginning of the tenth century BCE, which alone sufficed as a refutation of Marsham's theories.[33]

In between Vossius and Marsham, several other chronological works saw the light, including Ussher's highly influential *Annales Veteris Testamenti* (1650–54). The work provided a reliably dated chronology of the events recorded in the Masoretic version of the Old Testament, with Creation set in 4004 BCE and the Flood in 2349 BCE. Unlike Petavius, Ussher incorporated Manetho's kings, but only in so far as they fitted Scriptural chronology, ignoring the first fourteen dynasties.[34] Scaliger, Petavius, and Ussher had thus adopted three different strategies in dealing with Manetho's list. The first considered it too good to be false, yet was unable to harmonize it with the record in Scripture and therefore presented it as a hypothetical alternative. Petavius simply ignored it, because any source that did not agree with Scriptural chronology had to be incorrect by default. Ussher, finally, accepted only those elements that fitted the Masoretic timeline of Scripture, and did so unreservedly. Similar issues, such as the long lists of Persian kings provided by the ancient Greek historian Ctesias (5th century BCE),

[32] Levitin, *Ancient Wisdom*, 156-59.
[33] J. Ussher, *Annales Veteris Testamenti a Prima Mundi Origine Deducti…* (2 vols., London, 1650–54), Vol. 1, 31.
[34] Ibid., Vol. 1, 6 ff.

were dealt with in the same way: they were either taken with a grain of salt, or incorporated into the Septuagint or Masoretic timeline.

1.3 The Christian chronologist

Although Scaliger, Petavius, Ussher, and other scholars like Vossius and Marsham had shaped the discipline as it existed in Newton's days, it did not originate with them, or with the Renaissance scholars they so dramatically improved on. In fact, by putting so much emphasis on these luminaries and their technical prowess, there is a danger of losing sight of what chronology actually was, and how it functioned. The ordering of genealogies and events was as old as the writing of history, with Manetho's kings list a prime example. When it came to the chronology found in Scripture, from the dawn of Christianity scholars had tried to interpret the pagan histories they were confronted with and make them agree with the *sacred history* found in the Old Testament records, a term that originates with Augustine and to which I will return below. Apart from the historical books in Scripture, in particular the books of the prophets contained ample historical references, many of which related to future events. The most poignant of these prophecies were those in the book of Daniel, which together with those in the New Testament book of Revelations, dealt with Christ's second coming and the events leading up to that.

1.3.1 The visions of the Four Monarchies

According to the book that bears his name, Daniel was a noble Jew who as a young boy was exiled to Babylon, and lived there throughout the entire seventy years of the captivity, which lasted until 539 BCE, the year of the Persian conquest.[35] In the second chapter of the book, the Babylonian king Nebuchadnezzar was troubled by a dream in which a massive statue appears, composed of various materials: the statue's head was made of gold, the torso of

[35] Dan. 1:3-7 and 9:2.

silver, the belly and thighs of brass, the legs of iron, and the feet partially iron and partially clay. Yet the statue was not to last: as Daniel told Nebuchadnezzar, 'Thou sawest till that a stone was cut out without hands, which smote the image upon his feet that were of iron and clay, and brake them to pieces.' In a second vision, this time experienced by the prophet, four rather oddly shaped animals emerged: a lion with wings like an eagle, a bear with three ribs between his teeth, a four-winged leopard, and finally a fourth beast, 'dreadful and terrible, and strong exceedingly; and it had great iron teeth: it devoured and brake in pieces, and stamped the residue with the feet of it…' The last animal, which the prophet found hard to describe, had ten horns, three of which were subsequently uprooted by another, little, horn, which had eyes and spoke all sorts of great – and blasphemous – things.[36]

Contrary to similar visions in other parts of Scriptures, those in Daniel were followed by a detailed interpretation. In Nebuchadnezzar's dream, each part of the statue represented a different kingdom. According to Daniel, the golden head was the kingdom of Babylon, which would be followed by three other kingdoms of lesser grandeur; the fourth and last kingdom, that of iron, would eventually be divided into smaller kingdoms. The stone that rolled down and destroyed the statue referred to a kingdom of a wholly different nature, a heavenly kingdom that would last forever, consuming all the others. In the second vision, the animals again represented different monarchies, with the imagery this time focussing on the nature of their reign: two-fold, swift, brutal. All of these characteristics, and the order in which the parts of the statue and the animals were described, provided clues for the ancient chronologist to identify which monarchies the animals represented. Moreover, these were not just visions, experienced by an otherwise unimportant historical figure. They were written down in Scriptures by a prophet, described as 'greatly beloved' by God, to whom the Lord had sent the angel Gabriel to provide explanation – the same angel who would appear before Mary and announce the birth of Christ.[37] Sacred chronology could be marred by incomplete descriptions

[36] Dan. 2:31-45 and 7:3-28, quoted from 2:34 and 7:7, KJV.
[37] Dan. 9:23, Luke 1:19, KJV.

or by Hebraized names of foreign rulers, leaving the chronologist the task of making the correct identification. But the prophecies were the spoken words of God, and thus infallible. The difficulty lay in the correct interpretation of these words, a task Christian commentators and historians took up eagerly as I will discuss next.

1.3.2 Jerome, Augustine, and *historia sacra*

The four monarchies from Daniel had been employed as a framework for history since the days of the Church Fathers. Jerome, in his *Commentary on Daniel*, identified the first animal with the Babylonian empire, and the second, the ferocious bear, with the Persians. The three ribs in its mouth then referred to the three original kingdoms of the Babylonians, the Medes, and the Persians, which had been reduced to a single realm.[38] The leopard represented the Macedonians under Alexander the Great, who so swiftly conquered part of Europe and all of Asia, but who, like a leopard, 'charge[d] headlong to shed blood, and with a single bound rushe[d] to its death.' The four wings then referred to Ptolemy, Seleucus, Philip Arrhidaeus, and Antigonus, who divided up the empire after Alexander's untimely demise. Finally, Jerome had no trouble identifying the terrible fourth beast as the pagan Roman Empire, 'devouring and crushing, and pounding all the rest to pieces under his feet', quoting from the Septuagint. The ten horns which had sprouted from the fourth beast then referred to successor kings.[39]

In his *Against the Christians*, the Roman Neoplatonic philosopher Porphyry (c. 234–c. 305) had argued that the ten kings culminated in the cruel Antiochus IV Epiphanes (c. 215–164 BCE), the 'little horn' who had persecuted the Jews during the Maccabean Wars.[40] This

[38] Jerome, *Commentary on Daniel*, 74. See also R. Courtray, 'Der Danielkommentar des Hieronymus', in K. Bracht and D.S. du Toit (eds.), *Die Geschichte der Daniel-Auslegung in Judentum, Christentum und Islam: Studien zur Kommentierung des Danielbuches in Literatur und Kunst* (Berlin, 2007), 123-50, esp. 140; J. Braverman, *Jerome's Commentary On Daniel: A study of comparative Jewish and Christian Interpretation of the Hebrew Bible* (Washington D.C, 1978), 84-89.

[39] Jerome, *Commentary on Daniel*, 75-77.

[40] Ibid., 15, 76. Porphyry's work has only been preserved in fragments, primarily through the works of Augustine, Eusebius, Jerome, and Macarius. In this passage, taken from 'his twelfth book against the prophecy of Daniel' (p. 15), Porphyry followed Flavius Josephus, *Judean Antiquities*, 10.275-6: 'And there would come into being from them a certain king who would make war against his nation and

interpretation ran headlong into the more conventional early Christian identification of the little horn with Antichrist mentioned in the New Testament, whose revelation would herald the end of the world. Irenaeus (c. 130–c. 202), discussing the end of the fourth monarchy, referred to the little horn as 'the son of perdition', a term used for Antichrist in several passages of the New Testament, and equating the horn with 'the wicked one', mentioned by the apostle Paul.[41] Hippolytus of Rome (c. 170–235), in his *On Christ and Antichrist* and his *Commentary on Daniel*, explicitly stated that the little horn referred to Antichrist, who would be 'shameless and warlike and a tyrant daring to exalt himself over every god.'[42] Following Irenaeus and Hippolytus, Jerome resorted to a more traditional interpretation according to which the Roman Empire at the eve of its destruction – which coincided with the End Times – would be divided among ten kings. Three of these would subsequently be slain by an initially 'insignificant' eleventh king, who for a period in time would reign over all.[43]

Augustine referred positively to Jerome's interpretation of the four monarchies, but warned against too strict an interpretation of the events following the fourth beast, including the number of kings and Antichrist. 'I am afraid we may be deceived in this, and that he may come unexpectedly while there are not ten kings living in the Roman world,' he warned in *City of*

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their laws and would take away the way of life based on them and would plunder the temple and would prevent the sacrifices from being offered for three years. And our nation did indeed suffer these things under Antiochus Epiphanes just as Daniel saw and wrote they would happen many years beforehand…' However, Josephus did not consider Antiochus' reign as the final episode and awaited the coming of the Messiah as the stone that would smash the statue. See also J.J. Bruce, 'Josephus and Daniel', *Annual of the Swedish Theological Institute*, 4 (1965), 148-62; M. Tilly, 'Die Rezeption des Danielbuches im hellenistischen Judentum', in Bracht and Du Toit, *Geschichte der Daniel-Auslegung*, 32-54, esp. 46-50.

[41] Irenaeus, *Against Heresies*, 5.25; 2 Thess. 2:8. The reference to the 'son of perdition' returns in John 17:12 and 2 Thess. 2:3.

[42] Hippolytus, *On Christ and Antichrist*, 25; *Commentary on Daniel*, 4.5.3, 4.12.4-5, 4.14.1, 4.49.1 (quoted); trans. T.C Schmidt, *Hippolytus of Rome: Commentary on Daniel and 'Chronicon'* (Piscatawat, NJ, 2017), 179. See also K. Bracht, ''Logos parainetikos': Der Danielkommentar des Hippolyt', in Bracht and Du Toit, *Geschichte der Daniel-Auslegung*, 79-97; G.C. Jenks, *The Origins and Early Development of the Antichrist Myth* (New York, 1991), 27-116.

[43] Jerome, *Commentary on Daniel*, 77. Probably referring to Hippolytus' *Christ and Antichrist*, Irenaeus, in *Against Heresies*, 5.26.1, said: 'John, in the Apocalypse… teaches us what the ten horns shall be which were seen by Daniel'; for Jerome on Porphyry, see also A. Magny, *Porphyry in Fragments: Reception of an Anti-Christian Text in Late Antiquity* (Farnham, 2014), 55-98.

God, suggesting that the number ten could be taken metaphorically to represent a multitude of kings, echoing, though not specifically mentioning, the words of Peter and Paul that 'the day of the Lord will come as a thief in the night.'[44] Augustine himself preferred a different historical framework, consisting of six epochs, modelled on the six days of creation, of which he provided a detailed exposition in his study of the book of Genesis.[45] Just as Man was created on the sixth day, the sixth epoch had begun with the preaching of the gospel by Christ, the Son of Man, and it would end with his second coming, after which there would be a period of eternal rest, the Sabbatical seventh day. Such a periodic scheme did not originate with Augustine; similar divisions were commonly used in patristic literature in various forms, and often equated each period with a thousand years.[46] Elsewhere, Augustine developed another temporal framework founded on various passages from the New Testament by Paul, who distinguished between *ante legem*, *sub lege*, *sub gratia*, and *in pace*, or *before the law*, *under the law*, *under grace*, and *in peace*, which proved particularly influential throughout the Middle Ages.[47]

What was special in Augustine's writings was his notion of *historia sacra*. It is commonly agreed that Augustine was the first to provide a dual understanding of history: one

[44] Augustine, *City of God*, 20.23; 1 Thess. 5:2-4; 2 Peter 3:10; see also Matt. 24:43 and Rev. 16:15.
[45] Augustine, *On Genesis, against the Manichees*, 1.23; see also *City of God* 16.43, 2.30; *Catechizing of the Uninstructed*, 22.39. See also P. Fredriksen, 'Apocalypse and Redemption in Early Christianity: From John of Patmos to Augustine of Hippo', *Vigiliae Christianae*, 45 (1991), 151-83, esp. 160-63.
[46] Augustine, *City of God*, 22.30. See also D.C. Alexander, *Augustine's Early Theology of the Church: Emergence and Implications* (New York, 2008), 218-26; R.A. Markus, *Saeculum: History and Society in the Theology of St Augustine* (Cambridge, 1970), 17-18; J. van Oort, 'The end is now: Augustine on History and Eschatology', *HTS Teologiese Studies/Theological Studies*, 68/1188 (2012), 1-7, esp. 3. For a concise overview of classical and patristic historical periodization, see P. Archambault, 'The Ages of Man and the Ages of the World: A Study of two Traditions', *Revue d'Etudes Augustiniennes et Patristiques*, 12 (1966), 193-228.
[47] P. Fredriksen, 'Expositio quarundam propositionum ex epistula apostoli ad Romanos (Commentary on Statements in the Letter of Paul to the Romans)', in A.D. Fitzgerald et al. (eds.), *Augustine through the Ages: An Encyclopedia* (Grand Rapids, MI, 1999), 345-6; id., *Apocalypse and Redemption*, 163-64; J. Wetzel, 'Ad Simplicianum', in Fitzgerald, *Augustine through the Ages*, 3-34. For the influence of Augustine's temporal division on medieval scholars, see e.g. M.A. Travassos Valdez, *Historical Interpretations of the 'Fifth Empire': The Dynamics of Periodization from Daniel to António Vieira, S.J.* (Leiden, 2010), 214-15.

comprehensive, the other inspired, as exemplified by the earthly and the heavenly city.[48] On the one hand, history dealt with the happenings of mankind through time and space. On the other hand, *historia sacra* referred to events recorded in the Scriptures, which were divinely inspired and therefore accurate. They also showed God's plan for the salvation of mankind, and in particular his plan for his people, the Church, demonstrating divine providence. This aspect of *historia sacra* can be labelled *redemptive history*, but they should not be equated. When Augustine talked about *historia sacra*, the two elements of biblical history and God's saving grace were both present and inseparable.[49] Apart from *historia sacra*, there is the history of other peoples and places, taken from non-Scriptural sources. According to Augustine, this *profane history*, never referred to as such by Augustine but useful as a differentiating concept, could be used to gain a better understanding of the events mentioned in the Bible. However, Augustine considered it inherently inferior to *historia sacra* because it lacked the revelatory quality of God's written word. What is clear though, is that for Augustine history in general was never just a narration of past events, but arose from the tragic fall of man. All history showed God's providence; but only the inspired *historia sacra* showed the *meaning* of these events. Similarly, just as God revealed his saving hand through time, the irrevocable and irreversible river of the tragedy of sin but also the medium of salvation, he also provided the prophecies in Scripture. Although in his earlier writings Augustine considered history and prophecy as mutually exclusive, one dealing with the past, the other with the future, in *City of God* all *historia sacra* is in essence prophetical, revealed truth. The ages of history then, be they past, present, or future, divided not profane, but sacred history: they only functioned in the economy of salvation.[50]

For some modern scholars, *historia sacra* refers to the history as written down in Scripture and/or the history of the Church, often lacking the inspired dimension. For instance, in his

[48] Augustine, *City of God*, 15.1-27. For most what follows, see Markus, *Saeculum*, 1-21. See also Van Oort, 'The End is Now', 2.
[49] Markus, *Saeculum*, 10-17; F.-M. Schölz, '"Historia sacra et profana" bei Augustin', *Freiburger Zeitschrift für Philosophie und Theologie* 8 (1961), 308-21, esp. 320-21.
[50] Augustine, *City of God*, 13.14 and 15.8-9; see also Markus, *Saeculum*, 14-15.

analysis of the early modern Catholic use of the term, Simon Ditchfield equates *historia sacra* with biblical history, *historia ecclesiastica*, and hagiography, fuelled by categories used in important religious libraries of the time.[51] Although it is clear that early modern scholars, when discussing *sacred history*, commonly referred to just the historical parts of Scripture, they recognised and respected its inspired dimension. Thus when the book of Daniel mentioned a Darius the Mede whose name did not return in other historical writings, scholars sought to harmonise the profane with the sacred account by suggesting Darius had been known under a different name. Darius must have existed, for it was impossible for *sacred history* to contain fiction. In fact, the idea that the character of Darius might have been made up by the author of Daniel was only first suggested in the early twentieth century.[52]

This also renders problematic the definition of *historia sacra* proposed by Jan Assmann, 'the specifically monotheistic and biblical, both Jewish and Christian, concept of myth as history being preordained and governed by God.'[53] This definition might perhaps be accurate from an interpretative post-religious point of view, but it does not do justice to its understanding in history: with one or two exceptions, no one in Newton's days, or before him, would have referred to the Biblical narratives as myths. In general, it seems best to understand *historia sacra* or *sacred history* in the way Augustine did: as the inspired word of God, written down by Man. The term *sacred chronology* should then be used to refer to the factual historical events recorded in Scripture. Finally, *historia ecclesiastica* refers to the history of the Church, as found in Scripture, but also in other sources. Depending on one's theological framework, this could also include the history of Israel as recorded in the Old Testament.

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[51] S. Ditchfield, 'What Was Sacred History? (Mostly Roman) Catholic Uses of the Christian Past after Trent', in K. Van Liere et al. (eds.), *Sacred History: Uses of the Christian Past in the Renaissance World* (Oxford, 2012), 72-98. See also E.W. Cochrane, *Historians and Historiography in the Italian Renaissance* (Chicago and London, 1981), 445; Levitin, *Sacred History*, 1118.

[52] H.H. Rowley, *Darius the Mede and the Four World Empires in the Book of Daniel: A Historical Study of Contemporary Theories* (Cardiff, 1935), 44-60, esp. 59.

[53] J. Assmann, 'Myth as historia divina and historia sacra', in D.A. Green and L.S. Lieber, *Scriptural Exegesis: The Shapes of Culture and the Religious Imagination. Essays in Honor of Michael Fishbane* (Oxford, 2009), 13-24, esp. 13.

1.3.3 Reformation history

Augustine's student Paulus Orosius (fl. 414–18) was the first to write a full-fledged history of the world based on Daniel's four monarchies, although he disagreed with Jerome on the identity of the third and fourth monarchies and instead opted for the Assyrians and the Medes.[54] In his *Seven Books of History against the Pagans*, he described history as the unfolding of God's plan with mankind, in agreement with Augustine's historiographical ideas. His work was highly influential throughout the Middle Ages and was translated into several languages, including Old English and Arabic.[55] In the early sixteenth century, Reformers like Luther and Melanchthon chose to follow Jerome's interpretation, which had been handed down through the centuries via the medieval *Glossa Ordinaria*, a collection of marginalia – glosses – from the Church Fathers and later authors printed in the margins of the Vulgate.[56] Protestant historians like Johann Carion and Johann Sleidan developed full scale narratives of the history of the world based on Daniel's four monarchies that were immensely popular throughout the Early Modern period.[57] Apart from Sleidan, it was clear that all of these Protestant authors had one institution and one person in mind as the fulfilment of the prophecies of the fourth animal and Antichrist: the Roman Catholic Church and the Pope.

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[54] Markus suggests that Augustine commissioned Orosius to write the history, possibly because he was too occupied with ecclesiastical matters himself, but perhaps because he was not that interested in writing history per se; see *Saeculum*, 4-5. P. van Nuffelen, *Orosius and the Rhetoric of History* (Oxford, 2012), 3, claims that Orosius deliberately sought an affiliation with Augustine to 'cash in' on the latter's reputation; see also W.H.C. Frend, 'Paulus Orosius', in Fitzgerald, *Augustine through the Ages*, 615-17.

[55] Orosius, *Seven Books of History against the Pagans*, ed. by A.T. Fear (Liverpool, 2010), 24-25. See also J.O. Fichte, 'The Shaping of European historiography: Beda, 'Historia Ecclesiastica Gentis Anglorum' (c. 731) and Geoffrey of Monmouth, 'Historia Regum Britanniae' (c. 1136)', in J.F. Leonhard et al. (eds.), *Medienwissenschaft: Ein Handbuch zur Entwicklung der Medien und Kommunikationsformen*, *Vol. 1* (Berlin and New York, 1999), 636-48, esp. 637.

[56] W. Schmidt-Biggemann, *Philosophia Perennis: Historical Outlines of Western Spirituality in Ancient, Medieval and Early Modern Thought* (Dordrecht, 2004), 396.

[57] W.S. Reid, 'The Four Monarchies of Daniel in Reformation Historiography', *Historical Reflections / Réflections Historiques*, 8 (1981), 115-23.

Sleidan (1506–1556), in his *De Quatuor Monarchii*s (1559), identified the two-winged lion as representing both the Assyrian and Babylonian empires, the bear as the Persian, and the leopard or panther as the reign of Alexander the Great.[58] However, most of his work was taken up by an elaborate account of the Roman Empire, with the still extant Holy Roman Empire as its continuation following the tradition of *translatio imperii*.[59] It is especially in his treatment of the events of the fourth century where the true nature of Sleidan's history comes to light. After Constantine embraced Christianity the age of the Bishops of Rome began, in which time 'the Man of Sin, and the Mystery of Iniquity was beginning to work.'[60] Sleidan interspersed his history of the Roman Empire with the history of the Church, in particular the institution of the Holy See – or not so holy, thought Sleidan, as he expanded on 'the fraudulent Pretences of the Popes Boniface and Celestimus' and their successors.[61] Discussing how the Western Roman Empire was translated from its original Italian origins to its European successors by 'a wondrous Game of Fortune', he strongly condemned the legality of the process and inserted a warning: 'I thought good to add this for the Instruction of the Readers, that they may with the more Pr[u]dence and Caution read the Books of the Romanists. For there are more Examples than one, that their chief care is to give the Face of Antiquity to their Laws, which would gain them the greater Veneration and Authority.'[62] Contrary to many of his successors, in particular most seventeenth century English authors, Sleidan did not insist that the Pope was Antichrist or the Whore of Babylon mentioned in the book of Revelation.[63] Having summarized his identification of the four empires and the ten horns – Syria, Egypt, Asia, Greece, Africa, Spain,

[58] J. Sleidan, *De Quatuor Monarchiis* (Cambridge, 1686 [1559]), 19-38. See also A. Kess, *Johann Sleidan and the Protestant View of History* (Aldershot, 2008), 83-8; M. Pohlig, *Zwischen Gelehrsamkeit und konfessioneller Identitätsstiftung* (Tübingen, 2007), 161-75.
[59] Schmidt-Biggemann, *Philosophia Perennis*, 378, 396-406; Pohlig, *Gelehrsamkeit*, 92-93, 160-61.
[60] Sleidan, *De Quatuor Summis Imperiis: An Historical Account of the Four Chief Monarchies or Empires of the World* (London, 1695), 92.
[61] Ibid., 117.
[62] Ibid., 133, 138.
[63] Sleidan only once referred to the Whore of Babylon, when he discussed the period of the Western Schism (1378-1417) when there two and later three popes, in Rome, Anagni, and Avignon: 'Petrarch, who when the Pope and Cardinals resided at Avignon, called that place the Whore of Babylon…'; ibid., 197.

France, Italy, Germany, and Britain – he identified the little horn as the Turkish Monarchy, which, according to Sleidan, had conquered three of the most important parts of the Roman Empire: Egypt, Asia, and Greece. The little horn speaking 'great things' evidently referred to Mohammed's 'new Doctrine', Islam. Although he did not use the term explicitly, it is clear that the Turk represented Antichrist, for, as he wrote, they would persecute the Christians 'with the greatest cruelty and barbarity, even to the end of the world, as Daniel assures us… with this Turkish Empire the World shall have an end, nor shall be any after it, but that eternal and never-fading Kingdom of Christ.'[64] Sleidan received fierce criticism from fellow German Protestants for insisting that what was left of the Roman Empire, his native Germany, was 'but a very faint shadow of what it was… a lean carcass of an empire.'[65] However, he probably considered it was worth it: as he put it, the study of the prophecies of Daniel were of utmost importance to Man 'plac'd in this last act of World… to be consulted… in these days of Evil, that we may fortifie ourselves with a certain and true comfort, as by some Bulwork, against that inundation of distresses which are bursting in upon us.'[66]

While Sleidan's work was highly influential throughout the early modern period, the *Chronica Carionis* (1532) was even more popular. Before the end of the sixteenth century several dozen editions had been published – seven within one year – in a variety of European languages, and it was particularly significant in Lutheran circles.[67] Although originally written by Johann

[64] Ibid. 202-03, 207. The English 1689 translation by Edmund Bohun lists only nine nations, omitting – ironically – 'Brittannia'; compare with Sleidan, *De Quatuor Monarchiis*, 332. For eschatological elements in Renaissance and early modern interpretations of the Ottoman threat, see B. Charry, 'Turkish Futures: Prophecy and the Other', in A. Brady and E. Butterworth (eds.), *The Uses of the Future in Early Modern Europe* (New York, 2010), 73-89; see also K.M. Setton, *Western hostility to Islam and prophecies of Turkish doom* (Philadelphia, 1992), 7-27; C. Hill, *Antichrist in Seventeenth-Century England* (London, 1971), 181-82; Firth, *The Apocalyptic Tradition in Reformation Britain 1530-1645* (Oxford, 1979), 17-19.

[65] Sleidan, *De Quatuor Summis Imperiis*, 143, 201. See D.R. Kelley, 'Sleidan and the Origins of History as a Profession', *The Journal of Modern History*, 52 (1980), 573-98, esp. 594-96.

[66] Sleidan, *De Quatuor Summis Imperiis*, 208.

[67] J. Knape, 'Melanchthon und die Historien', *Archiv für Reformationsgeschichte*, 91 (2000), 111-26, esp. 119. Uwe Neddermeyer mentions 134 editions of Carion and 92 of Sleidan; see his 'Das Katholische Geschichtslehrbuch des 17. Jahrhunderts: Orazio Torsellinis 'Epitome Historiarum'', *Historisches Jahrbuch*, 108 (1988), 469-83, esp. 473. See also id., ''Was hat man von solchen confusionibus [...] recht und vollkömmlichen berichten können?' Der Zusammenbruch des

Carion (1499–1537), the published edition – in the German vernacular – was commonly known as Philipp Melanchthon's, since he had received the manuscript from Carion the year before its publication and thoroughly revised it. The updated Latin second edition, published shortly before Melanchthon's death in 1560, dealt with the history of the world up to Charlemagne; his son-in-law Caspar Peucer (1525–1602) subsequently expanded the work to include the period up to Charles V.[68]

The *Chronica* used a dual temporal framework, with the four monarchies of Daniel mapped onto the 'Vaticinium Eliae', a threefold scheme taken from the Babylonian Talmud.[69] Probably first applied by Hippolytus (170–235), occasionally used by Augustine, and often found in the works of mediaeval historians such as Isidore of Seville and the Venerable Bede, the rabbinic school of Elijah taught that world history was divided into three periods of 2,000 years each, with the third period commencing with the (first) coming of the Messiah.[70] Reappropriated in the Christian tradition along the lines of Paul's tripartite division of *before the law*, *under the*

einheitlichen europäischen Geschichtsbildes nach der Reformation', *Archiv für Kulturgeschichte*, 76 (1994), 77-110, esp. 81-82; Schmidt-Biggemann, *Philosophia Perennis*, 403-08.

[68] Knape, 'Melanchthon und die Historien', 119. For Carion, whose short but notable career included a role as court astrologer for Joachim I of Brandenburg, see D. Fürst and J. Hamel, *Johann Carion (1499–1537): Der erste Berliner Astronom* (Berlin, 1988). Cf. Schmidt-Biggemann, *Philosophia Perennis*, 403, who attributes only the revision of 1558/60 to Melanchthon. For Peucer's überarbeitung of the *Chronicon Carionis*, see U. Neddermeyer, 'Kaspar Peucer: Melanchthon's Universalgeschichtsschreibung', in H. Scheible, *Melanchthon in seinen Schülern* (Wiesbaden, 1997), 69-101. See also Pohlig, *Gelehrsamkeit*, 175-89; Firth, *Apocalyptic Tradition*, 14-15; E. Cameron, 'Primitivism, Patristics, and Polemic in Protestant Visions of Early Christianity', in Van Liere et al., *Sacred History*, 27-51, esp. 42-46.

[69] Schmidt-Biggemann, *Philosophia Perennis*, 402-03; see also Knape, 'Melanchthon und die Historien', 124; G.M. Spiegel, 'Historical Thought in Medieval Europe', in L. Kramer and S. Maza, *A companion to Western historical thought* (Malden, MA, and Oxford, 2002), 78-98, esp. 83; E. Breisach, 'World History Sacred and Profane: The Case of Medieval Christian and Islamic World Chronicles', *Historical Reflections/Réflexions Historiques*, 20 (1994), 337-56, esp. 351-52.

[70] 'The Tanna debe Eliyyahu ['The Lore of the School of Elijah'] taught: The world is to exist six thousand years; the first two thousand years are to be void; the next two thousand years are the period of the Torah, and the following two thousand years are the period of the Messiah. Through our many sins a number of these have already passed [and the Messiah is not yet].' Babylonian Talmud, Seder Nezikin, Avodah Zarah, 1, fol. 9a, trans. I. Epstein, *Soncino Babylonian Talmud* (35 vols., London, 1935-48), Vol. 27, 7008. See Hippolytus, *Commentary on Daniel*, 4.23.1-24.9; E. Cameron, 'Cosmic Time and the Theological View of World History', *Irish Theological Quarterly*, 77 (2012), 359-64, esp. 354; P. Fredriksen, 'Paul and Augustine: Conversion Narratives, Orthodox Traditions, and the Retrospective Self', *Journal of Theological Studies*, 37 (1986), 3-34, esp. 24-26. See also JWL ASC Ms. N47 HER, fol. 33, for Newton's familiarity with the passage.

law, and *under grace*, the first period ran from the creation of the world until the times of Abraham and the foundation of Babylon, the second ended with the birth of Christ.[71] This also meant that Christ's return, and thus the Day of Judgement, would occur at the end of the second millennium CE. Writing before Sleidan, Carion opted for the Assyrian Empire as the first monarchy, locating its reign in Babylon. But whereas Sleidan provided just a short description of the rise and fall of the empire, Carion and Melanchthon embedded their history in an overarching narrative that included the Jews, Egypt, the Trojan War, and the founding of Rome.[72] Likewise, the subsequent Persian and Greek empires received a much more elaborate treatment than Sleidan provided, whose polemical agenda made him focus primarily on the 'dreadful and terrible' fourth beast. Obviously, the reformer Melanchthon shared Sleidan's sentiment towards the Roman Catholic Church, to the extent that with him not the Turk, but the Pope had to be Antichrist, citing the celibacy of the clergy and the 'blasphemous' Mass as evidence.[73] This would not have come a surprise to his reformed audience: in 1523, together with Martin Luther, he had had published a pamphlet on the 'Pope-Ass', which with its title and content, left nothing to be misunderstood. As he stated, '[t]hrough countless signs, and in particular reigns, God has always prefigured his mercy or wrath in wondrous ways, as we see in Daniel 8. There he also speaks about the reign of the Roman Antichrist, in order that all true Christians would be beware of its cunning…'[74] Contra Porphyry, he asserted that

[71] Ph. Melanchthon and K. Peucer, *Chronicon Carionis* (Geneva, 1625), 6-7. Here the text referred to 'circumcision' as the start of the second period; the original German edition has 'Abraham'; J. Carion, *Chronica* (Wittemberg, 1532), 8.

[72] Carion, *Chronica*, 15-40; Melanchthon and Peucer, *Chronicon Carionis,* 30-67. Carion also included the legend of Hercules, perhaps influenced by Sebastian Franck's *Geschichtsbibel* of 1531.

[73] Melanchthon and Peucer, *Chronicon Carionis*, 9, 567.

[74] 'Gott hat alweg sein gnade oder zorn durch ettliche zeichen, und sonderlich die herschafften, wunderlich damit furgebildet, wie wir sehen Danielis. viii. Daselbst er denn auch des Römischen Antichrists reich verkundigt hatt, auff das sich alle warhafftige christen wusten zu huten fur des selben schalkheit…' Ph. Melanchton and M. Luther, *Deutung der zwei greulichen Figuren, Papstesels, in Rom, und Munchkalb, zu Freyberg in Meyssen funden* (Wittemberg, 1523), sig. A ii^{v}; Luther, on the other hand, identified the little horn as Mahomet, but not Mahomet as Antichrist; see A. Francisco, *Martin Luther and Islam: a study in sixteenth-century polemics and apologetics* (Leiden and Boston, 2007), 79-84. See also Hill, *Antichrist*, 9-10; L.P. Buck, *The Roman Monster: An Icon of the Papal Antichrist in Reformation Polemics* (Kirksville, MO, 2014), 103-59. For a concise overview of Luther's concept of history, see Pohlig, *Gelehrsamkeit*, 79-93; M. Wriedt, 'Luther's Concept of History and the

Antiochus Epiphanes had not been Antichrist, but a type of it and indeed of the Papal reign. Just as the prophecies in Daniel served as a forewarning for the Jews against Antiochus, so they might serve as a forewarning for Christians against Antichrist.[75]

Melanchthon's *Chronicon* was as much a world history as it was a history of the Church, first of the people of Israel, then from Christ onwards as the Church proper. Initially part of his main narrative, from the days of Valentinian I (r. 364–375), Melanchthon inserted distinct headers – *De Ecclesia* – to discuss events that dealt with ecclesiastical organisation and dogmatic development.[76] It is clear that for Melanchthon the history of the world and that of the Church were inseparable. Joachim Knape recognizes in Melanchthon what he considers the three main functions of history: legitimizing, didactic, and explanatory, aspects that are obviously intertwined. Melanchthon employed history to support the legitimacy of the new, Protestant confession, which he considered the rightful and untainted continuation of the early and pure Church. Understanding history then became understanding how God acted through time, and how the Church fared through the ages, with its history of corruption. According to Melanchthon, writing in the introduction to the *Chronicon Carionis*, the Church had many reasons to study history: because God chose to reveal himself through history; in order to gain a better understanding of the prophets; to understand the dogmatic controversies of the past; and to gain a better understanding of God's actions through a comparison of Church and profane history.[77]

Unsurprisingly, Catholic historians had a different take on all this, in particular the identification of the Pope as Antichrist. Scholars such as Orazio Torsellini (1545–1599), Caesar Baronius

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Formation of an Evangelical Identity', in B. Gordon, *Protestant History and Identity in Sixteenth Century Europe* (2 vols., Aldershot, 1996), 31-45.

[75] 'Antiochum esse typum Antichristi & quidem regni Pontificii', Melanchthon and Peucer, *Chronicon Carionis*, 138; 'Deinde cogitemus, ut piis profuit apud Judeos, esse praemonitos, ne assentirentur regno Antiochi, ita sciamus nos quoque commoneri, ne assentiamur regno Antichristi, seu regno impio dominanti in ecclesia', Ph. Melanchthon, *In Danielum Prophetam Commentarius* (Wittemberg, 1543), 62^{r}.

[76] Melanchthon and Peucer, *Chronicon Carionis*, 302, 338, 458, 662, 817.

[77] Ibid., 3; Knape, 'Melanchthon und die Historien', 119. See also Kess, *Johann Sleidan*, 129-32.

(1518–1607) and Jean Bodin (1530–1596) defended Catholic dogma and ignored or criticised the use of the four monarchies as a valid scheme.[78] Bodin even thought it had originated with Melanchthon and Sleidan, for which he was firmly chastised by the Oxford historian Degory Wheare (1573–1647).[79] Wheare's work was not so much a universal history as an elaborate treatise on proper historiographical methodology. As such, he embraced modern philological methods as popularized by Scaliger, Vossius, and Justus Lipsius; yet, the veracity of the Scriptures was beyond all doubt. Praising the recently published *History of the World* (1614) by Walter Raleigh, which dealt with the history of Israel and the first three monarchies, he extolled a forthcoming work by Vossius based on 'so great a Treasury of Antiquity and History', but immediately added: '...however, let the History of the Bible lead the way, which is incontestably not only the most ancient, but the truest of all Histories…'[80] Likewise, the study of the history of the Church was to be preferred over the study of profane history: although the latter contained many things that were 'pleasant and usefull to be known,' ecclesiastical history contained more things 'which are necessary' and therefore afforded 'more and better fruits.'[81]

[78] O. Torsellini, *Epitome Historiarum* (Rome, 1598); C. Baronius, *Annales Ecclesiasticae* (12 vols. Rome, 1588-1607); J. Bodin, *Methodus ad facilem historiarum cognitionem* (Paris, 1566). Torsellini's work would become the dominant historical textbook amongst Catholics until at least the late eighteenth century, see Neddermeyer, *Katholische Geschichtslehrbuch*, 470-6. For Baronius, see also Cochrane, *Historians and Historiography*, 459-63.

[79] 'In veteratus error de quattuor imperiis, ac magnorum virorum opinione peruulgatus tam altè radices egit, ut vix evelli posse videatur. habet enim propè infinitos bibliorum interpretes; habet è invioribus Martinum, Melanchthonem, Sleidanum...; rerum divinarum eo antiquitatis homines valdè peritos: quorum autoritate fractus aliquando minimè dubitandum esse putabam.' 'A long-established, but mistaken, idea about four empires, made famous by the prestige of great men, has sent its roots down so far that it seems difficult to eradicate. It has won over countless interpreters of the Bible, including among modern writers Martin [Luther], Melanchthon, Sleidan… men well read in ancient history and divine matters. Sometimes, shaken by their authority, I used to think it should not be doubted.' Bodin, *Methodus*, 346; D. Wheare, *Method and Order* (London, 1685 [1623]), 30-31; J.H.M. Salmon, 'Precept, example, and truth: Degory Wheare and the 'ars historica'', in D.R. Kelley and D.H. Sacks, *The Historical Imagination in early modern Britain: History, rhetoric, and fiction, 1500-1800* (Cambridge, 1997), 11-36, esp. 23.

[80] Wheare, *Method and Order*, 41-42. The Vossius reference is most likely to his *De historicis Graecis libri quatuor*, which would be published a year later. For Raleigh, see also Firth, *Apocalyptic Tradition*, 180-95.

[81] Wheare, *Method and Order*, 359-62.

For all his emphasis on the prominence and moral superiority of sacred over profane history, Wheare was very well aware that the recent scholarship he so lauded had begun to cast doubt on the veracity of the chronology found in Scripture. Ancient authors like Strabo and Pliny had shown that the Egyptians and Ethiopians had had vast dominions, conquering the Middle East and parts of Europe. 'Yet', he added, 'that the said IV Monarchies did much excell all these, is too well known to need any proof.' Instead, he argued, the reason why we refer to these four empires as 'monarchies' is because they reigned over other empires, which must have included the Egyptians and Ethiopians, echoing Melanchthon.[82] Although the concept of the four monarchies remained well and alive throughout the seventeenth century, it slowly disappeared as a purely historical framework. Petavius, following Catholic suit, did not include it in his *De doctrina temporum* (1627) or *Tabulae chronologicae* (1628), nor did it return with Protestant scholars after Wheare. As Joseph Levine has shown, it seems that the entire idea of universal history was in decline during the second half of the seventeenth century, when Newton had just begun his chronological studies. Athanasius Kircher's *Oedipus Ægyptiacus* (1652–55) dealt with just the history of ancient Egypt; others focussed on the Greeks, Romans, or Persians. The devotion of erudite scholars to select periods, topics, and histories, and the sheer accumulation of facts they unearthed made it harder to compose an all-encompassing narrative.[83] It was perhaps for this reason that Arthur Bedford took a different approach: his *Scripture Chronology demonstrated by Astronomical Calculations* of 1730 focussed on the narrative as provided by sacred history, interspersed with sections on the history of the Mediterranean world in which the Biblical events were set.

However, the four monarchies were never far away. They might no longer have featured prominently in works of history, but their inclusion in Scripture made sure they rang in the background of any history of Persia, Greece, and in particular of the Roman Empire in its

[82] Ibid., 37-38; Melanchthon, *Codex Carionis* [1559], 33-34; see also A. Grafton, 'Kircher's Chronology', in Findlen, *Athanasius Kircher*, 171-87, esp. 177.
[83] See J.M. Levine, *The Battle of the Books: History and Literature in the Augustan Age* (Ithaca and London, 1991), 21, 92.

ancient or modern guise. How alive the idea of the four monarchies was in seventeenth century England, is perhaps best illustrated by the Protestant response to the ominous events of the 1660s.

1.3.4 Fifth Monarchism and anti-Catholicism

A movement extreme even by Puritan standards, Fifth Monarchists were awaiting the imminent return of Christ in or near the year 1666, when he would establish his millennial reign, following the four monarchies that had gone past.[84] Among them, they counted several prominent members, such as Major-General Thomas Harrison; other notable names included John Carew, and Vavasor Powell.[85] One of the most prolific pamphleteers of the group, in 1653 erstwhile New England minister William Aspinwall (c. 1605–d. in or after 1662) authored a programmatic statement in which he equated the little horn with King Charles, 'a fierce & arrogant Tyrant, & persecutor of the Saints,' now rightfully disposed of by Parliament 'who slew the Beast.'[86] The fifth monarchy was still to come, but would not be long in waiting, and would be headed by Christ, with his righteous saints – read: Oliver Cromwell and his followers – as 'the Lambs Military Officers.'[87] Eventually, when Christ had returned and restored the peace, his thousand year reign predicted in the book of Revelation would commence.[88] As

[84]G.P. Rogers, *The Fifth Monarchy Men* (Oxford, 1966); B. Capp, *The Fifth Monarchy Men: a Study in Seventeenth-century Millenarianism* (London, 1972); see also Hill, *Antichrist*, 80, 263, 283.
[85] Rogers, *Fifth Monarchy Men*, 14-17, 40-42, 102-09; Capp, *Fifth Monarchy Men*, 76-98, 239-70; Farr, *Major-General Thomas Harrison: Millenarianism, Fifth Monarchism and the English Revolution 1616-1660* (Farnham, 2014), 103-37.
[86] W. Aspinwall, *A Brief Description of the Fifth Monarchy or Kingdome, that shortly is to come into the World…* (London, 1653), 1; F.J. Bremer, 'Aspinwall, William (d. in or after 1662), merchant and separatist leader in America', *ODNB*; S.L. Robbins, 'Manifold Afflictions: The Life and Writings of William Aspinwall, 1605–1662' (Oklahoma State University, diss., 1988); id., 'Aspinwall, William (1605–?), tract writer and public figure', *ANB*; see also W. Aspinwall, *An Explication and Application of the Seventh Chapter of Daniel…* (London, 1653); id., 'Speculum Chronologicum or a briefe Chronologie & Series of the times collected out of the Scriptures, showing the proper seasons wherein Kings were done from the Creation of the world, untill the death of our Saviour Christ Anno 3963', Bodleian Ms. Rawlinson B.156 (unpublished treatise); Rogers, *Fifth Monarchy Men*, 29-31; Capp, *Fifth Monarchy Men*, 240-41. Hill, *Antichrist*, 109.
[87] Aspinwall, *Brief Description*, 4.
[88] Important millenarians included the Cambridge educated minister Thomas Brightman (1562–1607), the Herborn scholar Johannes Alsted (1588-1638) and the Cambridge theologian Joseph Mede

such, the Fifth Monarchists were ardent millenarians, like many of their contemporaries, but obviously with their own members at the helm, 'assisting' Christ in displacing 'unfit or unfaithful persons… and if it cause to be, to censure and punish them.'[89]

Although the Restoration put a spanner in the works of those eagerly anticipating the return of Christ, there were plenty of other signs that the Day of Judgement might be near. Two harbingers of doom, the comets of December 1664 and March 1665, were followed by a massive outbreak of the bubonic plague in and around London. Barely recovered, most of the city went up in flames in the Great Fire of September 1666. Ministers all over England and New England, in particular Puritans and Dissenters, were eager to assert the hand of God in the terrible events that had struck London. James Janeway (d. 1674), who had witnessed the plague and fire first hand, began his admonition to the inhabitants of London with words that left none to be mistaken: 'The Great and Dreadful God hath been pleading with poor England in these last years, in such manner as is scarce to be parallell'd in foregoing ages: He hath left the Print of his Fingers behind him, and written the Divine Displeasure in Letters of Blood.'[90] As Janeway saw it, this was the Lord's rightful punishment for man's wickedness and his unwillingness to take heed of his call for repentance.

(1586-1638), whose interpretations of the prophecies greatly influenced Newton. Amongst the wealth of literature on early modern millenarianism, noteworthy publications include, but are not limited to, R. W. Cogley, 'Seventeenth Century English Millenarianism', *Religion*, 17 (1987), 379-96; H. Hotson, *Paradise Postponed: Johann Heinrich Alsted and the Birth of Calvinist Millenarianism* (Dordrecht, 2000); J.K. Jue, *Heaven upon Earth: Joseph Mede (1586–1638) and the Legacy of Millenarianism* (Dordrecht, 2006); the essays in J.E. Force and R.H. Popkin (eds.), *Millenarianism and Messianism in Early Modern European Culture, Volume III: The Millenarian Turn: Millenarian Contexts of Science, Politics, and Everyday Anglo-american Life in the Seventeenth and Eighteenth Centuries* (Dordrecht, 2001) and in J.C. Laursen and R.H. Popkin (eds.), *Millenarianism and Messianism in Early Modern European Culture, Volume IV: Continental Millenarians: Protestants, Catholics, Heretics* (Dordrecht, 2001); M. Feingold, ''And Knowledge Shall Be Increased': Millenarianism and the Advancement of Learning Revisited', *The Seventeenth Century*, 28 (2013), 363-93. See also Capp, *Fifth Monarchy Men*, 23-49; Hill, *Antichrist*, 26-28. Firth, *Apocalyptic Tradition*, 164-77.

[89] Aspinwall, *Brief Description*, 10.

[90] J. Janeway, *A seasonable and earnest address to the citizens of London, soon after the dreadful fire which consumed the greatest part of that famous metropolis, in the year 1666. By that Reverend and faithful minister Mr. James Janeway…* (Boston, 1760), 3.

When it came to anti-Catholicism, apart from Fifth Monarchists and a few other dissenting theologians, the overwhelming majority of eschatological interpreters firmly put popish Rome down as the reign of Antichrist. Gilbert Burnet (1643–1715), chaplain to Charles II, who would become Bishop of Salisbury in 1689 and preached the coronation sermon of William III that same year, referred to 'the… carnal and gross conceptions the Roman Doctrine offers of God in their Image and Mass-worship, and by their Idolatry to Saints… all the cruelty of the heathen Persecuters, cannot match the practices of that Whore, that hath been so often drunk with the blood of the Saints and of the Martyrs of Jesus.'[91] It is a sentiment that would have rung a bell with Newton. As I will discuss later, by the late 1670s he had written a sermon of his own on the idolatrous practices of the people of Israel. By 1689, he had also composed a full-fledged treatise on where those idolatrous practices came from, the origins of image worship.

In a series of treatises on the four monarchies of Daniel and the prophecies in Revelation, the first published in 1684, independent minister Thomas Beverley (d. 1702) assured his audience that the reign of the 'Antichristian Bestian Empire' would end in 1697, a figure he had to adjust when the year came and went without so much of a hint as to Christ's return.[92] Beverley listed three essential components of this 'bestianism': monarchic Roman power, since the little horn mentioned in Daniel had sprouted from the head of the fourth animal, the Roman Empire; idolatry, in particular the worship of images under the guise of worshiping the true God, which in the book of the prophet Isaiah was referred to as blasphemy and thus connected with the

[91] G. Burnet, *The Mystery of Iniquity Unvailed: In a Discourse, Wherein is held forth the Opposition of the Doctrine, Worship, and Practices of the Roman Church, to the Nature, Designs, and Characters of the Christian Faith* (London, 1673), 78, 106; M. Greig, 'Burnet, Gilbert (1643-1715)', *ODNB*. See also T. Claydon, 'Latitudinarianism and Apocalyptic History in the Worldview of Gilbert Burnet, 1643–1715'*, The Historical Journal*, 51 (2008), 588-93; W. Johnston, 'Revelation and the Revolution of 1688-1689', *The Historical Journal*, 48 (2005), 351-89, esp. 368.

[92] These included Th. Beverley, *A Calendar of Prophetic Time…* (London, 1684); id., *A Scripture-Line of Time...* (1687); id., *The Kingdom of Jesus Christ Entering its Succession at 1697* (London, 1689), *The Good Hope through Grace...* (London, 1700). See also W. Johnston, 'Thomas Beverley and the 'Late Great Revolution': English Apocalyptic Expectation in the Late Seventeenth Century', in A. Hessayon and N. Keene, *Scripture and Scholarship in Early Modern England* (Aldershot, 2006), 158-75; id, *Revelation Restored: The Apocalypse in Later Seventeenth-century England* (Woodbridge, 2011), 125-51; Jue, *Heaven upon Earth*,163-66.

'great things' spoken by the little horn; and 'Bloodiness, Cruelty, and Persecution, Ravaging upon the Saints of God, and of Christ.'[93]

Not all agreed with the idea that the fifth monarchy, or millenarian reign of Christ, was yet to come. Henry Hammond (1605–1660), erstwhile chaplain to Charles I, argued against the historicist interpretation of Daniel and Revelation, and instead insisted that the thousand-year reign had already passed between Emperor Constantine's conversion to Christianity in 312 and the rise of the Ottomans in the fourteenth century.[94] Just like Hugo Grotius, he identified Antichrist not with the Pope, but with a religio-historical movement, Gnosticism, headed by Simon Magus whom the Church Fathers considered the inventor of all heresies.[95] Another prominent divine opting for a such a preterist interpretation, the presbyterian Richard Baxter (1615–1691), agreed with Hammond on the timing of the fifth monarchy, but added a sixth one, the reign of the Turks. According to Baxter, there would be a seventh, everlasting monarchy, following Christ's return and Judgment Day, though he refrained from pinpointing an exact date.[96]

1.3.5 Chronology at the turn of the century

This, I argue, is the background against which we must understand the study of chronology in seventeenth century England: through the eyes of Scriptural prophecy, natural calamities, and

[93] Beverley, *Kingdom of Jesus Christ*, 49-51; Johnston, 'Revelation and the Revolution', 358-60, 377-80.
[94] H. Hammond, *A Paraphrase and Annotations upon all the Books of the New Testament* (4 vols., Oxford, 1845 [1653]), Vol. 4, 615-19; See also Johnston, *Revelation Restored*, 61-62.
[95] Hammond, *Paraphrase*, 271-77, 454-56. For Grotius' influence on Hammond, see *Priest*, 229; Levitin, *Sacred History*, 469. Simon Magus, aka Simon the Sorcerer, appears in Scripture in Acts 8:4-25, where it is said that he believed and was baptized (v. 13); yet when he offers money to the Apostles Peter and John to 'command' the Holy Spirit, Peter rebukes him: 'your heart is not right before God' (v. 21) and 'you are full of bitterness and captive to sin' (v. 23), NIV. For Simon Magus as the alleged founder of Gnosticism, see A. Ferreiro, *Simon Magus in Patristic, Medieval and Early Modern Traditions* (Leiden, 2005), 43-45; S. Haar, *Simon Magus: The First Gnostic?* (Berlin and New York, 2003).
[96] R. Baxter, *The Glorious Kingdom of Christ* (London, 1691); Johnston, *Revelation Restored*, 63-64. For Baxter, see W. M. Lamont, *Richard Baxter and the Millennium: Protestant imperialism and the English revolution* (London, 1979); see also Jue, *Heaven upon Earth*, 150-56.

raging religious controversies. The chronology of ancient civilizations was intrinsically connected with their religious loci in the framework of Christian eschatology. It is impossible to consider the history of the Assyrians, the Greeks, or the Romans, as distinct objects of study, without taking into account the various religious connotations with which those histories were understood or polemicized.

When it comes to the study of the discipline of chronology, most attention has gone to the period stretching from the mid-fifteenth century to the mid-seventeenth century, with particular emphasis on figures such as Joseph Scaliger, Gerardus Vossius, and the equally learned Isaac Casaubon and Hugo Grotius.[97] Anthony Grafton has suggested that after these 'greats' the discipline became muddled and that polemical debates using chronology as a tool had taken over from the study of chronology proper.[98] Indeed, it is difficult to characterize the status of the field in Newton's England around the turn of the seventeenth century. There was a general absence of key figures performing sophisticated technical chronological research. There was also an absence of universal histories, exceedingly popular throughout the sixteenth and early seventeenth century, with these instead being replaced by highly detailed studies of particular dynasties. Others focussed on well-defined periods in sacred and profane history, or the prophecies related to these periods, allowing one to wholly ignore questions about the primacy and antiquity of the Assyrian or Egyptian dynasty. For example, Henry More's studies of the prophecies in the book of Daniel remained sufficiently vague about the period before the captivity and focussed primarily on the prophecy of the Seventy Weeks, which had direct relation to the date of Christ's birth and the coming of Antichrist in the end

[97] The literature is vast, but important publications include H. Parenty, *Isaac Casaubon, helléniste: des studia humanitatis à la philologie* (Genève, 2009); H.J.M. Nellen, *Hugo Grotius: a lifelong struggle for peace in church and state, 1583-1645* (Leiden, 2015); the various contributions in C.R. Ligota and J.-L. Quantin (eds.), *History of Scholarship: A Selection of Papers from the Seminar on the History of Scholarship Held Annually at the Warburg Institute* (Oxford, 2006); in E. Jorink and D. van Miert (eds.), *Isaac Vossius (1618–1689) between Science and Scholarship* (Leiden, 2012); and in Blair and Goeing, *For the Sake of Learning;* see also the references included with § 1.2 above. Levitin, *Ancient Wisdom*, 156-64, provides what is so far the most elaborate discussion of the work of John Marsham.

[98] Grafton, 'Rise and Fall', 170 ff.

times.[99] Following a tradition that originated from the second century BCE, each of the seventy weeks described in Daniel 9:24-27 was interpreted to last for seven years, totalling up to a period of 490 years. Originally interpreted by Jewish scholars as referring to the period between the return from exile and the destruction of the Temple in 70 CE, early Christian theologians soon focussed on both the birth of Christ and his second coming as pivotal events.[100] Likewise, fellow Cantabridgian Ralph Cudworth, in his *True Intellectual System of the World* (1678), insisted on the divine inspiration of the prophecies in Daniel, which were the result of 'the immediate, supernatural revelation of God Almighty', contrary to what 'some learned men, both of former and latter times' had argued.[101] Here Cudworth responded directly to Porphyry, and most likely to Grotius and Marsham, who followed Porphyry in arguing that the prophecies of Daniel had been fulfilled during the centuries after the Babylonian Exile.[102]

At the same time, suggestions were brought forward that the histories of Egypt, Assyria, and other ancient civilizations such as China might be older than allowed for by the chronology found in Scripture. Already in 1655 Isaac La Peyrère had argued that there had been people living before Adam.[103] The existence of these 'pre-Adamites' would explain the extensive population of the earth so soon after Adam. Isaac Vossius, son of Gerardus, did not have much sympathy for La Peyrère's conjecture, but instead preferred the Septuagint chronology which left enough space for the ancient history of China. He also argued for a decidedly local

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[99] H. More, *An Explanation of the grand Mystery of Godliness…* (London, 1660), 290-97; id., A *plain and continued exposition of the several prophecies or divine visions of the Prophet Daniel...* (London, 1681). See also P.C. Almond, 'Henry More and the Apocalypse', *JHI*, 54 (1993), 189-200.

[100] M.H. Farris, 'The formative interpretations of the seventy weeks of Daniel' (University of Toronto, diss., 1990), 33-35, 84-122 and *passim*. In the interpretation that emerged from Hippolytus of Rome (170-235 CE), Christ's first coming was situated at the end of the 69th week, and his return during the 70th week, thus inserting a gap of indefinite length between these two final weeks. Hippolytus, *Commentary on Daniel*, 4.28.1-35.3. See also Farris, 'Formative interpretations', 142-53

[101] R. Cudworth, *The True Intellectual System of the Universe* (London, 1678), 714.

[102] J. Marsham, *Canon Chronicus Ægyptiacus, Ebraicus, Graecus, et disquisitiones...* (London, 1672), sig. 4r and 611-19.

[103] I. La Peyrère, *Prae Adamitae* (Amsterdam, 1655). See also W. Poole, 'Seventeenth-century Preadamism, and an Anonymous English Preadamist', *The Seventeenth Century*, 19 (2004), 1-35;
A. Schnapp, 'The Pre-adamites: An Abortive Attempt to Invent Pre-history in the Seventeenth Century?', in Ligota and Quantin, *History of Scholarship*, 399-412.

character of Biblical history based on the absence of a Flood narrative in Chinese historiography.[104] Scholars such as Edward Stillingfleet and Pierre-Daniel Huet responded by defending the veracity of the Old Testament when compared with pagan sources, although Stillingfleet too opted for the Septuagint chronology.[105]

In general, seventeenth century scholarly responses to the discrepancies between pagan and sacred chronology either involved putting in question the veracity of the former, or adopting the Septuagint timeline for the latter. Many scholars ignored the issue by focussing on 'safe' histories, such as that of Greece, which fitted neatly in the Masoretic timeframe, or only include the clearly postdiluvian parts of Manetho's list. But few attempted, or dared, to reconstruct a universal history along the lines of Sleidan, Melanchthon or Ussher. When in 1717 rumours emerged that no less a luminary than Isaac Newton had set his mind to the task, and his *Short Chronicle* was going the rounds, expectations were high.

1.4 Isaac Newton… chronologist?

It is clear that until the mid-1710s, only a handful of his contemporaries knew of Newton's chronological studies. In 1694, David Gregory, the Scottish mathematician, visited Newton in Cambridge and reported on his interest in ancient history in his private notes and correspondence, discussing it with fellow Scotsman Archibald Pitcairne who was eager to

[104] I. Vossius, *Dissertatio de vera aetate mundi, Qua ostenditur Natale Mundi Tempus Annis minimum 1440 vulgarem Aeram anticipare* ('s Gravenhage, 1659). See also T. Weststeijn, 'Spinoza sinicus: An Asian Paragraph in the History of the Radical Enlightenment', *JHI*, 68 (2007), 537-61, esp. 541-48; A. Grafton, 'Isaac Vossius, Chronologer', in Jorink and Van Miert, *Isaac Vossius*, 43-84; S. Mandelbrote, 'Isaac Vossius and the Septuagint', in Jorink and Van Miert, *Isaac Vossius*, 85-117.

[105] E. Stillingfleet, *'Origines' Sacrae, Or, A Rational Account of the Grounds of Christian Faith, as to the Truth and Divine Authority of the Scriptures, and Matters Therein Contained* (London, 1662); P.-D. Huet, *Demonstratio Evangelica* (Paris, 1679). See also S. Hutton, 'Edward Stillingfleet, Henry More, and the decline of Moses Atticus: a note on seventeenth-century Anglican apologetics', in R. Kroll et al. (eds.), *Philosophy, science, and religion in England 1640–1700* (Cambridge 1992), 68-84, esp. 70-71; A.G. Shelford, *Transforming the Republic of Letters: Pierre-Daniel Huet and European Intellectual Life, 1650–1720* (Rochester, NY, 2007); Levitin, *Ancient Wisdom*, 84-86 and 154-55.

receive a copy of the treatise Newton had been working on.[106] After 1696, when Newton moved to London to take up a position at the Royal Mint, only those in his direct surroundings would have known what he was working on, and then perhaps only superficially.

One particular group of people who did have access to Newton's chronological writings were the scribes he employed to copy out the treatises and chapters he was working on. On Humphrey Newton (not related), his amanuensis during the mid-to-late 1680s, it did not leave a lasting impression. In the letters he wrote to John Conduitt, who with his wife Catherine – Newton's half-niece – had taken care for Newton in his dotage and who had been appointed his executor, Humphrey vividly recalls how he copied out the *Principia* – that 'stupendous work' – but made no mention of the various copies of the chronological materials Newton had him make.[107] Contrary to that other natural philosopher obsessed with chronology, Johannes Kepler, Newton did not interact with the scholarly community through the Republic of Letters. Where Kepler directly engaged with Scaliger and other chronologists of the day to discuss their writings, Newton refrained from similar debates. The sole exception would be his short exchange of letters with Thomas Burnet, but that discussion centred on the physics Burnet employed in his *Sacred Theory of the Earth*, and Burnet's refusal to attach literal meaning to the six days of creation found in Genesis.[108]

1.4.1 The *Chronology of Ancient Kingdoms Amended*

What the scholarly world received in January 1728, less than a year after Newton's death, was a densely written volume, with six chapters that dealt with the chronology of ancient Greece, the Latins, Egypt, Assyria, Babylon, the Persians, and the Medes, and, rather curiously, with

[106] W.G. Hiscock (ed.), *David Gregory, Isaac Newton and Their Circle: Extracts from David Gregory's Memoranda, 1677–1708* (Oxford, 1937), 4; W.T. Johnson (ed.), *The best of our owne: Letters of Archibald Pitcairne, 1652-1713* (Edinburgh, 1979), 19, 22. See also *Correspondence*, Vol. 3, 334-40; *Historian*, 2; *Orig. of Civ.*, 145-46, 427 n. 9.
[107] Keynes Ms. 135, fol. 1.
[108] A. Grafton, *Worlds made by Words: Scholarship and Community in the modern West* (Cambridge, MA, and London, 1999), 114-36; S. Mandelbrote, 'Isaac Newton and Thomas Burnet: Biblical Criticism and the Crisis of Late Seventeenth-Century England', in *BNS*, 149-78, esp. 157-64; *Priest*, 240-42.

the Temple of Solomon. Instead of trying to agree the various Greek histories with each other and reconstruct their chronology, as scholars like John Selden and Gerardus Vossius had attempted, Newton worked from a pre-conceived timeline. This timeline centred on the pivotal identification of the Egyptian Pharaoh Sesostris with the Biblical Sesak, which he took from John Marsham.[109] From his calculations on the average lengths of reigns and generations, he subsequently derived a factor with which to multiply and thus shorten the duration of the various monarchies involved. These and various other considerations led him to place the Argonautic expedition in 937 BCE, almost three centuries later than Petavius had calculated, redating other important historical events and personae likewise.[110]

Newton's methods, interpretations, and results generated significant criticism. That mounted by the French scholars Nicolas Fréret and Etienne Souciet was based solely on the abstract, and included many inferences – most of them incorrect – as to how Newton had arrived at particular dates, with which they disagreed. Fréret suggested that Newton should have taken the ancient Greek historians more seriously, their 'being better informed of their own history than we can be today, we who live more than two thousand years after them and who have no other memoirs than the ones they left us.'[111] Souciet's more elaborate treatise took issue with every single aspect of Newton's textual interpretation and reasoning, considering his system of chronology 'wholly unsustainable'.[112] But when the full *Chronology* became available, more substantial critiques appeared, exposing not only how Newton had been cherry-picking passages from ancient authors that suited his framework, but moreover

[109] Ibid., 70; *Historian*, 100-02; *Orig. of Civ.*, 203, 224-28.
[110] D. Petavius, *The History of the World* (London, 1659), 28. See also *Orig. of Civ.*, 343.
[111] '...on se croit en droit de regarder les anciens Ecrivains de la Grece comme étant mieux instruits de leur propre Histoire que nous ne le pouvons etre aujourd'hui, nous qui vivons plus de deux mille ans apres eux et qui n'avons d'autres memoirs que ceux qu'ils nous ont laissez.' Cavelier and Fréret, *Abregé de la Chronologie*, 92.
[112] E. Souciet, *Recueil des dissertations… contenant un abregé de chronologie, cinq dissertations contre la chronologie de Newton, une dissertation sur une médaille singuliere d'Auguste* (Paris, 1727), 112. For a detailed analysis of Fréret's and Souciet's critiques, see *Orig. of Civ.,* 307-30 and 353-80; C. Grell, 'La Réception des Travaux Chronologiques d'Isaac Newton en France au XVIIIe Siècle', *Archives Internationales d'Histoire des Sciences*, 62 (2012), 85-157. See also *Historian*, 21-36; F.A. Manuel, *A Portrait of Isaac Newton* (Cambridge, MA, 1968), 349-60.

interpreted these in rather idiosyncratic – and, according to his critics, erroneous – ways. Scholars such as Arthur Bedford, Samuel Shuckford, and William Whiston, presented lengthy treatises in which they demonstrated Newton's wilful neglect of passages that ran counter to his arguments, and seriously questioned the validity of his methods.[113] Others, like the religious controversialist John Jackson, pointed out some painful errors in Newton's research due to his use of a faulty Latin translation of Thucydides.[114] But there were also those such as the writer and historian Nathaniel Hooke who considered the *Chronology* a masterpiece, and who agreed with Newton's fundamental criticism of ancient history and impossible regnal chronologies.[115] Newton's posthumous scholarly work, including the *Observations upon the Prophecies of Daniel and the Apocalypse of St John* (1733), was thoroughly debated throughout the eighteenth century. As I will show in this thesis, of all of those who read and discussed these works, John Conduitt was perhaps the only one who understood how closely connected they had been in Newton's mind.

Whether Newton ever intended his work to be widely read, is another question. The unauthorized publication of the *Short Chronicle* seemingly forced his hand to publicly defend

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[113] A. Bedford, *Animadversions upon Sir Isaac Newton's Book, intitled The Chronology of Ancient Kingdoms Amended* (London, 1728); S. Shuckford, *The Sacred and Prophane History of the World Connected* (2 vols., London, 1728–30); W. Whiston, *Sir Isaac Newton's corollaries from his philosophy and chronology, in his own words* (London, 1728). Bedford explicitly argued that Newton's system differed to such a degree from sacred chronology that it could lead to atheism. As he added, 'indeed, we live in an age, when we cannot be too cautious… The divinity of our blessed SAVIOUR is struck at by reviving of the ancient and modern heresies; especially that, which destroyed all the eastern nations, and introduced Mahometism among them,' *Animadversions*, 143. Mandelbrote reads this as a reference to Arianism, suggesting that Bedford recognised in Newton what was clear in Newton's disciples William Whiston and Samuel Clarke; S. Mandelbrote, 'Newton and Eighteenth-Century Christianity', in CCtN^2, 554–85, esp. 557-58. Cf. Feingold, who asserts that the criticism Newton received was invariably grounded in contrasting interpretations of ancient history and had nothing to do with Newton's supposed anti-Trinitarianism; M. Feingold, 'Isaac Newton, heretic? Some eighteenth-century perceptions', in E. Boran and M. Feingold (eds.), *Reading Newton in Early Modern Europe* (Leiden, 2017), 328-45, esp. 341. It is not entirely clear whether Bedford indeed referred to Arianism; however, as I will show in § 4.4, it seems more likely that Newton received the label 'heterodox' for his liberal approach toward not *ancient*, but *sacred* history.

[114] J. Jackson, *Chronological Antiquities: or, the Antiquities and Chronology of the Most Ancient Kingdoms, from the Creation of the World, for the Space of Five thousand Years* (3 vols., London, 1752), Vol. 3, 344-45. See also § 2.4.

[115] N. Hooke, *The Roman History, from the Building of Rome to the Ruin of the Commonwealth, Vol. 1, second, corrected edition* (London, 1751), xxxviii-xli.

himself, but as he put it in the letter he sent to the Royal Society in response, he never intended to have his chronological work put to press. In general, Newton seems to have been reluctant to publish any materials at all. His first paper, the *New Theory of Light and Colours* (1672), received such critical response from natural philosophers like Robert Hooke, Christiaan Huygens, and several Jesuits, that by the end of the 1670s he had almost withdrawn from the public scene. Likewise, had it not been for Edmund Halley's visit in 1684, the *Principia* might never have seen the light.[116] There are several neat copies of his chronological writings, prepared at various stages throughout the forty years he devoted to the topic, which were most likely meant to be circulated among a small group of disciples such as David Gregory and Hopton Haynes, his assistant at the Mint.[117] As I argue elsewhere, his earlier misadventures with print had much to do with his idiosyncratic ideas about pedagogy and the communication of ideas, which he developed from his alchemical studies.[118] In the *New Theory*, instead of providing a wealth of experiments that built upon each other and together formed the evidence for his claims, Newton provided a single *experimentum crucis* with very limited instructions as to how to perform it. Only by putting in the hard work would the reader be able to replicate his findings, and thus be convinced. It is a sentiment echoed in a letter from William Derham, a close friend of Newton's, to John Conduitt, in which he recounted how Newton had deliberately made the *Principia* difficult to understand 'to avoid being baited by little Smatterers in Mathematicks, but yet so as to be understood by able Mathematicians, who he imagined, by comprehending his Demonstrations, would concurr with him in his Theory.'[119]

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[116] See R. Iliffe, "Those 'whose Business it is to Cavill': Newton's Anti-Catholicism', in J.E. Force and R.H. Popkin (eds.), *Newton and Religion: Context, Nature and Influence* (Dordrecht, 1999), 97-120, esp. 112-17; id., "Is he like other men?': The meaning of the *Principia Mathematica*, and the author as idol', in G. MacLean (ed.), *Culture and society in the Stuart Restoration* (Cambridge, 1995), 159-76, esp 160-64; *Priest*, 123-8' I.B. Cohen, *Introduction to Newton's 'Principia'* (Cambridge, 1971), 47-129. See also *Never at Rest*, 238-80 and 402-68.

[117] Most notably the *'Origines'*, which is now Yahuda 16.2, and the scribal fragment found in Yahuda Ms. 25.2f, fols. 34^{r}-43^{r}. For Haynes, see *Never at Rest*, 559-60 and *passim*.

[118] C.J. Schilt, "Tired with this subject…': Isaac Newton on publishing and the ideal natural philosopher', in F. Mellor and S. Webster (eds.), *The Silences of Science: Gaps and Pauses in the Communication of Science* (Abingdon, 2016), 65-88; see also id., 'To Improve upon Hints of Things': Illustrating Isaac Newton', *Nuncius*, 31 (2016), 50-77, esp. 59-62.

[119] William Derham to John Conduitt, 18 July 1733, Keynes Ms. 133, fol. 10^{r}. *Never at Rest*, 459.

Much later, Zachary Pearce claimed that with the *Chronology*, here too Newton had been obscuring his proofs; but as I will show in Chapter 2, this time something else was at stake: the unfinished state in which he left the manuscript.[120]

1.4.2 A fragmented corpus

Newton's chronological materials have attracted much scholarly attention. Frank Manuel's pioneering *Isaac Newton, Historian* (1963), and Jed Buchwald and Mordechai Feingold's *Newton and the Origin of Civilization* (2012), with its elaborate treatment of Newton's astronomical and genealogical calculations, are the most authoritative scholarly introductions to Newton's studies of ancient history.[121] Richard Westfall, who devoted ample time to Newton's scholarly writings, was unimpressed by his scholarship; in fact, he considered the *Chronology of Ancient Kingdoms Amended* 'a work of colossal tedium [which] excited for a brief time the interest and opposition of the handful able to get excited over the date of the Argonauts before it sank into oblivion.'[122] However, as Manuel had already shown, and as Buchwald and Feingold have reiterated, Newton's chronological writings were eagerly awaited by the larger scholarly community, and were discussed for decades.[123] When in 1782 Samuel Musgrave published an analysis of Newton's criticism of ancient Greek historiography, nearly six hundred people showed their interest by subscribing for one or more copies.[124] One manuscript that Westfall did appreciate, was 'Theologiae Gentilis Origines Philosophicae', Newton's earliest chronological treatise, which has also been studied in depth by Kenneth

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120 Z. Pearce, *A Commentary with notes on the Four Evangelists... prefixed some account of his lordship's life and character, written by himself...* (London, 1777), xliii.

121 See also M. Feingold, 'Isaac Newton, historian', in *CCtN*[2], 485-523; C. Grell, 'Chronologie et astronomie chez Newton', in E. Mehl and N. Roudet (eds.), *Le Temps des Astronomes: L'Astronomie et le Décompte du Temps de Pierre d'Ailly à Newton* (Paris, 2017), 349-72.

122 *Never at Rest*, 815. Id., 'Isaac Newton's *Theologiae Gentilis 'Origines' Philosophicae*', in W. W. Wagar, *The Secular Mind: Transformations of Faith in Modern Europe* (New York, 1982), 15-34; id., 'Newton's Theological Manuscripts', in Z. Bechler (ed.), *Contemporary Newtonian Research* (Dordrecht, 1982), 129-43.

123 *Historian*, 21-36, 166-93; *Orig. of Civ.*, 307-422.

124 S. Musgrave, *Two Dissertations: I. On the Graecian Mythology. II. An Examination of Sir Isaac Newton's Objections to the Chronology of the Olympiads* (London, 1782), i-xxii.

Knoespel and Rob Iliffe.[125] It was this treatise, commonly referred to as the 'Origines', which Newton discussed with Gregory, and which Pitcairne desired to read for himself.

Although in 1725 Newton downplayed the amount of energy he invested in the topic, the hundreds of chronology-related books in his library and the thousands of often densely packed folios totalling over a million words discussing ancient monarchies tell a different tale. When Richard de Villamil, the retired physicist who rediscovered the remains of Newton's library in the 1920s, first inspected its contents, he was struck by the hundreds of books dealing with classical themes.[126] Likewise, the chronology-related manuscript corpus is vast, and consists of thousands of folios with notes, drafts for paragraphs, chapters, and even entire treatises, about ten percent of his total writing output. These books, notes and drafts open up a world often hidden from the historian's eye: that of the early modern scholar at work.

What makes Newton's archive even more precious, is its near completeness. Here was a man who kept every sheet of paper he used. Even though calamities such as a fire in his rooms in 1677, which might well have destroyed an early version of *Opticks*, the posthumous handling of his manuscripts, and the auctioning off of most of the non-science related materials by Sotheby's in 1936, have resulted in the loss of some manuscripts, most have been recovered.[127] What has not been recovered, again thanks to how the manuscripts were managed after Newton's death, is the order in which Newton left them. With the papers being dispersed all over the world – contrary to those of other notable natural philosophers such as Galileo and Robert Boyle – this has also lead to several manuscripts ending up partially in one, partially in another collection.[128] But even if the 1727 order had remained, it would only

[125] K.J. Knoespel, 'Interpretative strategies in Newton's *Theologiae Gentilis 'Origines' Philosophicae*', in *CNI*, 179-202; Iliffe, '*Meaning of the* Principia', 165-67; *Priest*, 200, 208-10.
[126] R. de Villamil, *Newton, the Man* (London, 1931), 8.
[127] P.E. Spargo, 'Sotheby's, Keynes and Yahuda – the 1936 sale of Newton's manuscripts', in P.M. Harman and A.E. Shapiro (eds.), *The investigation of difficult things: Essays on Newton and the history of the exact sciences, in honour of D.T. Whiteside* (Cambridge, 1992), 115-34; S. Dry, *The Newton Papers: The strange and true Odyssey of Isaac Newton's manuscripts* (Oxford, 2014), 142-60.
[128] See M. Bucciantini, 'Celebration and Conservation: the Galilean Collection of the National Library of Florence', in M. Hunter (ed.), *Archives of the Scientific Revolution: The Formation and Exchange of*

be precisely that: the order in which Newton left the papers at the time of his death. Throughout his life, and throughout the life of his chronological projects, he would continuously reorder his materials, often reusing folios between various versions of a treatise or chapter. At times, he would return to an older version and copy from it, and keep it alongside the newer version. When he died, he was still in the process of writing the *Chronology*, as is reflected by the state of the corpus and, importantly, by the published volume. However, the manuscripts did not remain in that order: posthumous editors and would-be editors went through the piles of paper and imposed some of their own ordering principles. As a result, the corpus is in significant disarray, a fact recognised by serious Newton scholars. Yet without exception the same scholars have treated the various treatises and chapters found among Newton's papers as coherent entities when analysing their content. Manuel, who pioneered research into Newton's chronological studies, elevated a manuscript titled 'Original of Monarchies' to the status of standalone treatise; yet at the same time he noted that Newton had begun its title with 'Chapter 1', clearly suggesting it had been part of a larger whole.[129] Westfall grouped together several of Newton's writings, including Manuel's 'Original of Monarchies', under the heading of 'Theologiae Gentilis Origines Philosophicae', without ever seriously exploring whether and how these writings were actually connected. Instead, he declared his amalgamation the most important of Newton's religious writings, unable to appreciate that Newton himself considered his studies of the prophecies far more meaningful.[130]

Ideas in Seventeenth-Century Europe (Woodbridge, 1998), 21-34, esp. 21-2; M. Hunter, 'Mapping the Mind of Robert Boyle: the Evidence of the Boyle Papers', in id. (ed.), *Archives of the Scientific Revolution*, 121-36, esp. 121. As Joella Yoder has shown, Christiaan Huygens' archive, too, suffered from the interventional politics of well-willing editors, obscuring and rigorously reordering manuscripts, including title pages, thus making a 1716 catalogue which accurately reflected Huygens' own ordering 'relatively worthless'. Eventually, it took her over a quarter of a century to compile a new catalogue of the manuscripts; see id., 'The Archives of Christiaan Huygens and his Editors', in Hunter, *Archives of the Scientific Revolution*, 91-108, esp. 96-104, quoted from 102; id., *Catalogue of the Manuscripts of Christiaan Huygens Including a Concordance With His Oeuvres Complètes* (Leiden, 2013), xi.

[129] *Historian*, 12-13, 122; Keynes Ms. 146, fol. 1^{r}.

[130] *Never at Rest*, 351-52 n. 55; Westfall, 'Origines', 16. See also *Priest*, 219, and § 4.2 of this thesis, on the importance Newton attached to the study of the prophecies in Scripture.

As a result of this misappreciation, a rather distorted picture has emerged, as fragmented as the manuscript record. Manuel and Westfall made it seem as if Newton had pursued chronology only during the 1680s and early 1690s, then briefly around 1717 when he composed the *Short Chronicle*, and then again near the end of his life, during the 1720s, rewriting and transforming his earlier materials. Likewise, their emphasis on only a handful of neat writings provided a rather static picture, supporting their assertions about the periods Newton was working on his chronology. Buchwald and Feingold have tried to rectify this picture, by showing how Newton at various points between the 1690s and 1720s was adding to his chronological research. But although they present fairly robust dates for Newton's astronomical calculations, they have not improved upon Manuel, Westfall, and others in ordering and correctly dating Newton's writings. Manuel dated the 'Original of Monarchies' manuscript he considered most important as belonging to the early 1690s, based on Newton's handwriting. In this, he followed the authority of Herbert Turnbull, who just like Tom Whiteside, Rupert Hall, and Mary Boas Hall, lived under the impression they could date Newton's writing from the autograph. Whiteside even claimed to have developed the ability to date the hand 'within half a dozen years… and sometimes even more narrower still…'[131] No modern Newton scholar has repeated this claim, or subscribed to the correctness of Whiteside's, and for good reason. In general, Newton's hand remained fairly consistent throughout most of his career. His early hand is quite distinguishable, in particular for his use of scribal letters. Likewise, Newton's later hand, from the mid-1710s onwards, can be clearly identified, as it became shaky with age. However, with most of the materials Newton wrote between the late 1660s and the second decade of the eighteenth century, we have to rely on a combination of internal textual and external circumstantial evidence in order to date them.

[131] *Historian*, 198; A.R. Hall and M. Boas Hall, *Unpublished scientific papers of Isaac Newton: A selection from the Portsmouth Collection in the University Library, Cambridge* (Cambridge, 1962), 397; D. T. Whiteside, *The Mathematical Papers of Isaac Newton, Vol. 1: 1664–1666* (Cambridge, 1967), xi n. 2; see also Hunter, *Archives of the Scientific Revolution*, 12.

1.4.3 In praise of scribes

One important help with dating Newton's manuscripts is the presence of the hands of various assistants among his writings. From his second year at Trinity College onwards, he shared rooms with a man named John Wickins, who might have occasionally copied out his materials.[132] In the early 1680s, Wickins left Cambridge, and Newton enlisted the help of Humphrey Newton who would remain with him for five years. Humphrey's hand, which is clearly distinguishable from Newton's, appears most prominently among the materials for the *Principia*. Although we do not know exactly when Wickins left and Humphrey arrived, this was most likely in 1684. In the same letter to Conduitt, Humphrey recalled that he started working with Newton 'in the last year of King Charles 2d', which is 1684, and stayed on 'for about five years', according to his own recollection, hence until about 1689.[133] Westfall, though, suggested that Humphrey must have misremembered, since he made mention of 'that long frosty winter', which cannot have been any other winter than that of 1683, which means he would have left in 1688. Also, the Trinity College Exit and Redit book shows that his predecessor, John Wickins, left Trinity on 28 March 1683 and did not return.[134] But David Brewster, Newton's staunch nineteenth century biographer, pointed out that Wickins received the living of Stoke Edith, near Monmouth, only on 4 April 1684, which suggests that Humphrey arrived later that year.[135] It is not entirely clear why he left Newton's service, but it might have been connected with his master being called to London for the Convention Parliament, which first met on 22 January 1688/89.[136] Therefore, it seems legitimate to date the manuscripts in Humphrey's hand as written between 1684 and 1688. Obviously, the materials for the *Principia* can be dated even more precisely to between August 1684 and April 1686, when Newton sent

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[132] *Never at Rest,* 74-76, 342-43. Yahuda Ms. 23, a short treatise on Revelation, is in a hand that Westfall considered to be Wickins'; Westfall, 'Theological Manuscripts', 142.
[133] Ibid.; Charles II died 6 February 1684/85.
[134] *Never at Rest,* 343 n. 31.
[135] D. Brewster, *Memoirs of the Life, Writings, and Discoveries of Sir Isaac Newton* (2 vols, Edinburgh, 1855), Vol. 2, 86. See also Cohen, *Introduction*, 299.
[136] *Never at Rest*, 74-77, 343; T. Harris, *Revolution: The Great Crisis of the British Monarchy* (London, 2006), 320. Iliffe suggests Humphrey was in Newton's service between 1684 and 1688; see *Priest*, 200.

the manuscript, in Humphrey's hand, to the Royal Society.[137] The fact that there are multiple versions of the 'Origines' in the latter's hand shows that Newton was working on it at around the same time, most likely in the period after he finished the *Principia*, as he continued editing the manuscript after Humphrey had left.

Humphrey Newton and John Wickins were not the only amanuenses Newton employed. In 1709, Hopton Haynes, fellow anti-Trinitarian, prepared a Latin translation of *Two Notable Corruptions in Scriptures*, a critical analysis of Trinitarian key passages in the New Testament, which Newton originally sent to John Locke in 1690.[138] As the various hands among the manuscripts show, there were others who remain anonymous, and can thus not be employed to help ordering and dating Newton's manuscripts. However, they provide valuable information about Newton's publication strategies. From the neat copies of the 'Origines', it is clear that Newton at some point considered circulating the manuscript, and perhaps publishing it. In general, the presence of the hands of scribes and assistants among Newton's writings is incredibly valuable, even if their identity cannot always be verified. In Chapter 3, I will introduce an unknown copyist of materials related to the 'Original of Monarchies', working from drafts that are no longer part of the corpus. Together with the writings in Newton's hand, this copy allows us to demarcate the various stages in which Newton transformed the 'Origines' into what would become the *Chronology of Ancient Kingdoms Amended*.

When it comes to dating manuscripts, one other promising avenue involves the analysis of watermarks. Knowing when and where particular watermarks were used by paper manufacturers, this method can lead to another set of dates that in conjunction with textual analysis might provide more robust termini for the composition of particular writings.[139] Primarily using dated letters, Alan Shapiro, who considered Manuel's 'Original of Monarchies'

[137] *Never at Rest*, 402 ff.

[138] A. B. [= H. Haynes], *Causa Dei contra Novatores* (London, 1747), 57-58; W. Whiston, *A Collection of Authentick Records, Belonging to the Old and New Testament* (2 vols., London, 1727–28), Vol. 2, 1070-77; Haynes' translation is now Yahuda Ms. 20. See S. Mandelbrote, 'Eighteenth-century reactions to Newton's anti-Trinitarianism,' in J. E. Force and S. Hutton (eds.), *Newton and Newtonianism. New studies* (London, 2004), 93-111; *Priest*, 370-89.

[139] See e.g. E. Heawood, *Watermarks: mainly of the 17th and 18th centuries* (Hilversum, 1950).

'a relatively finished version of the first chapter' of the 'Origines', which it is not, inspected the watermarks of the folios Newton used and suggested a date of composition after March 1695/6. Others have provided dates of 1701/2 or early summer 1702, with Buchwald and Feingold suggesting that a second version of the piece should be dated to 1714.[140]

Apart from Shapiro's preferred option, which is a *terminus post quem*, all of the above dates are incorrect. As I will show in Chapter 3, Newton wrote the 'Original of Monarchies' between 1702 and 1706. What is more, the second version mentioned by Buchwald and Feingold is not a *later* version, but in fact an *earlier* composition; that is, the few folios of the manuscript that actually belong to the 'Original of Monarchies'. Most of this misdating game, to paraphrase Shapiro, is based upon the incorrect assumption that Newton's manuscripts are coherent, that subsequent folios have always been ordered as such, thereby wholly ignoring Newton's working practices and the ordering practices of later editors. This assumption has led to some unfortunate inferences about the development of Newton's chronological ideas, ascribing what were rather late changes in Newton's writings to a much earlier period, and vice versa. In order to correctly order and date these manuscripts, to understand how Newton's chronological ideas took shape, and to understand the underlying motivation for the massive amount of work poured into these writings, the historian needs to gain an understanding of how these manuscripts were edited. This involves first and foremost inspecting Newton's own editing practices, but also those of the scholars who set themselves the task of publishing his scholarly writings after he died.

Tracing both the editorial development of these manuscripts in Newton's hands and in the hands of his posthumous editors is a prerequisite for interpreting what Newton wrote in these manuscripts and how his ideas evolved. This requires a deep engagement with Newton's quotidian working practices and the minutiae of his reading, note-taking, and writing. No other

[140] A.E. Shapiro, 'Beyond the dating game: Watermark clusters and the composition of Newton's Opticks', in Harman and Shapiro, *Difficult things*, 181-227, esp. 197; R. Iliffe, 'A 'connected system'? The Snare of a Beautiful Hand and the Unity of Newton's Archive', in Hunter, *Archives of the Scientific Revolution*, 137-58, esp. 155; *Orig. of Civ.*, 195, 201-03, 230.

early modern scholar has left such a rich legacy in terms of notes and drafts and books, and it allows an almost unrivalled insight into a life often entirely hidden from sight.

1.5 Questions

This thesis is primarily concerned with Newton's chronological corpus and the relations between his reading, note-taking, and writing practices. At the same time, there appear to be strong ties between the chronological materials and some of his other projects, including his natural philosophical, alchemical, and religious studies. How and to what extent Newton's various projects were connected, both in reality and in how he perceived these connections, has been a topic of contention among Newton scholars ever since the emergence of his non-scientific papers.

1.5.1 All in pieces?!

In the 1970s, a major debate arose over the connections between Newton's natural philosophical and mathematical studies, and his alchemical pursuits. This 'embarrassing controversy', as Paolo Casini once deemed it, pitted two groups against one another.[141] On the one side were those who tended to minimise or even wipe out the idea that Newton was deeply involved in alchemical research, whereas the other placed the alchemy at the forefront, ignoring all other aspects. There were also those who tried to establish a middle ground, for example attempting to show how Newton's concept of force, a hallmark concept of the *Principia*, arose from alchemical principles.[142] The debate petered out in the 1990s, when a

[141] P. Casini, 'Newton: the *Classical Scholia*', *History of Science*, 22 (1984), 1-55, quoted from 12-13.
[142] Prime examples of the anti-alchemy position include the works of A.R. Hall and M. Boas Hall, who in their initial studies of Newton's alchemical notebook refused to call it by that name, and claimed that he did not practice alchemy; see id., 'Newton's Chemical Experiments', *Archives Internationales d' Histoire des Sciences*, 11 (1958), 113-52, esp. 116. In his biography of Newton, written more than three decades later, A.R. Hall maintained his opinion; see id., *Isaac Newton: Adventurer in Thought* (Cambridge, 1992). B.J.T. Dobbs' arguments were diametrically opposed to those of the Halls, as expressed in her *The foundations of Newton's alchemy, or, The hunting of the*

new generation of scholars emerged realizing that every single one of Newton's academic pursuits deserved attention in their own right.

Over the last four decades, Newton's various projects have been studied in depth. Scholarship on his natural philosophy and mathematics has continued with the works of, amongst others, Niccolò Guicciardini, Alan Shapiro, and George Smith. William Newman has devoted much effort to Newton's alchemical legacy, resulting in the online *Chymistry of Isaac Newton* project. In particular the works of Rob Iliffe, Scott Mandelbrote, and Steve Snobelen, have contributed immensely to our understanding of his religious life and ideas. Buchwald and Feingold's work, finally, provides a welcome insight in the chronological materials.[143] But the question of how particular aspects of Newton's intellectual activities were connected has remained. Iliffe has shown how Newton compartmentalized his interests, to some extent drawing clear methodological distinctions between for instance his theological and philosophical reasoning.[144] Others have focussed on the important role the study of alchemy played in his optics, the religious aspects of the General Scholium, and how Newton's religious beliefs informed his understanding of the cosmos.[145] Yet the chronological writings have so far been

greene lyon (Cambridge, 1975) and *The Janus face of genius: The role of alchemy in Newton's thought* (Cambridge, 1991). For proponents of the middle ground, see R. Westfall, 'Newton and Alchemy', in B. Vickers (ed.), *Occult and scientific mentalities in the Renaissance* (Cambridge, 1984), 315-35; J. Henry, 'Occult qualities and the experimental philosophy: Active principles in pre-Newtonian matter theory', *History of Science*, 24 (1986), 335-81.

[143] The bibliography here is vast, but important publications include N. Guicciardini*, Reading the Principia: the debate on Newton's mathematical methods for natural philosophy from 1687 to 1736* (Cambridge, 1999); id., *Isaac Newton on mathematical certainty and method* (Cambridge, MA, 2009); A.E. Shapiro, *The optical papers of Isaac Newton. Volume I: The optical lectures 1670-1672* (Cambridge, 1984); id., Harman, *Difficult things*; G.E. Smith, 'The methodology of the *Principia*' in *CCtN*, 138-73; the various contributions in I.B. Cohen and A. Whitman (eds.), *Isaac Newton,* The Principia: Mathematical principles of natural philosophy*, a new translation* (Los Angeles, 1999); S. Ducheyne, *The Main Business of Natural Philosophy Isaac Newton's Natural-Philosophical Methodology* (Dordrecht, 2012); W.R. Newman, 'The background to Newton's chymistry', in *CCtN*, 358-69; id., 'A preliminary reassessment of Newton's alchemy' in CCtN^2, 454-84; R. Iliffe, *Newton: A very short introduction* (Oxford, 2007); *Priest*; S. Mandelbrote, 'A duty of the greatest moment': Isaac Newton and the writing of biblical criticism', *BJHS*, 26 (1993), 281-302; id., 'Than this nothing can be plainer': Isaac Newton reads the Fathers', in G. Frank et al. (eds.), *Die Patristik in der Frühen Neuzeit* (Stuttgart, 2006), 277-97; S.D. Snobelen, "God of Gods, and Lord of Lords': The theology of Isaac Newton's General Scholium to the Principia', *Osiris*, 16 (2001), 169-208.

[144] R. Iliffe, 'Abstract considerations: Disciplines and the incoherence of Newton's natural philosophy', *Studies in History and Philosophy of Science*, 35 (2004), 427-54, esp. 431-32.

[145] W.R. Newman, 'Newton's early optical theory and its debt to chymistry,' in D. Jacquart and M. Hochmann (eds.), *Lumière et vision dans les sciences et dans les arts. De l'Antiquité au XVIIe siècle* (Geneva, 2010), 283-307; Iliffe, *Connected system*; Snobelen, 'God of Gods'; J. Henry, ''Pray do not

studied in isolation. With the exception of David Castillejo, who made several grandiose claims about the connections between Newton's *Chronology*, his studies of the Temple, and his optical science, no one has made any serious attempts to embed his chronological writings in the larger framework of his scholarly activities.[146]

1.5.2 A scholar at work

In summary, when it comes to Newton's chronological studies, there are four important and interrelated questions that have so far not received the attention they deserve. The first question pertains to the relations between his reading, note-taking, and writing practices. Newton's library contained hundreds of books related to the ancient world, many of which show signs of intensive reading. Likewise, his manuscripts contain dozens of folios filled with notes and excerpts, taken from classical authors and contemporary scholars. Some of these names returned in the more finished treatises and chapters he produced, others occur only in notes and drafts, leading to suspicions that Newton tried to obscure his sources. Although it is clear that he was influenced by his contemporaries in topic and argument, hardly any research has been done on what exactly Newton took from the works of these authors, and from the primary sources he consulted, and how he subsequently incorporated this data in his own writings.

The second question relates to the fragmented corpus of chronological writings and their order. As no scholar has failed to notice, and remark, the manuscripts that bear the fruits of Newton's decade-long studies of ancient civilizations are in significant disarray. Not only have they been dispersed all over the world, the manuscripts in even a single collection frequently appear as a haphazardly arranged series, with folios out of order, seemingly inserted in the wrong place, and others doubled or missing. So far, attention has been devoted to what at

ascribe that notion to me': God and Newton's gravity', in *BNS*, 123-47; S.D. Snobelen, ''To discourse of God': Isaac Newton's heterodox theology and his natural philosophy', in P.B. Wood, *Science and Dissent in England, 1688-1945* (Aldershot, 2004), 39-65

[146] D. Castillejo, *The expanding force in Newton's cosmos, as shown in his unpublished papers* (Madrid, 1981).

first sight appear more or less coherent pieces of writing, and the variant versions of passages found elsewhere. This has led to a fragmented discussion of Newton's chronological writings, as fragmented as the writings themselves, with many unwarranted conclusions about the development of his methods and ideas. What is needed, is a chronology of Newton's chronology, which means restoring the corpus in the order of composition; the only way to do this is by reconstructing Newton's own practices of ordering and reordering.

The third question involves Newton's reasons for studying chronology in the first place. Suddenly, in the 1680s, seemingly out of nowhere he became obsessed with ancient gods and kingdoms, and produced the 'Origines'. By the time of his death, in March 1727, he had filled thousands of folios with a detailed analysis of Greek, Latin, Egyptian, Assyrian, Babylonian, Median, Persian, and sacred history, aligning each of these chronologies with a scheme he had derived from rather idiosyncratic interpretations of ancient genealogies and astronomical observations. What motivated him to do so? All his other scholarly efforts, including his studies of Church history, doctrine, and the prophecies in Scriptures, had a clear purpose: the exposition of the Trinitarian heresy and the pollution of the primitive Christian doctrine by the Roman Catholic Church and their idolatrous worship, and the correct interpretation of the signs of the times.[147] What then did Newton intend to achieve or prove with his chronological research? So far, historians have assumed that Newton was simply writing a universal history of sorts, either to demonstrate the accuracy of Scriptural chronology, or, by taking that accuracy as a given, to demonstrate the inaccuracy of pagan records. But this does not answer the question of why Newton felt the need to do so, or how such a universal history would fit in the greater scheme of his scholarly work.

This brings me to the fourth and final question, concerning the relations between Newton's chronological writings and his other studies. So far, historians have either singled out particular chronological writings such as the 'Origines', or they have attempted to discuss how Newton's

[147] See R. Iliffe, 'Prosecuting Athanasius: Protestant forensics and the mirrors of persecution', in Force and Hutton, *Newton and Newtonianism*, 113-54; *Priest*, 123 ff. and *passim*.

ideas evolved from the 1680s until the 1720s. The connections with his many other interests remain largely unexplored, with attention primarily focussed on methodological parallels.[148] Yet there are many thematic connections, in particular with his studies of the prophecies, which only become apparent upon closer inspections of the drafts for the *Chronology*. As such, the four questions I have outlined here are interrelated, and so are the answers to these questions. Newton's reading, note-taking, writing, and ordering practices inform us about how he approached the topic, and hence provide the keys for reconstructing the manuscript corpus. Likewise, the purpose of Newton's chronological studies becomes clear once one starts unravelling the genesis of the chapters from the *Chronology*. Thus the four main questions this thesis addresses can be summarized in one line: How did Newton perform his chronological studies, and to what purpose?

In the following chapters, I will discuss Newton's chronological studies from the perspective of his working methods. Chapter 2 is devoted to Newton's reading and note-taking practices, with particular emphasis on his earliest forays in chronology and the materials he collected to write the 'Origines'. Somewhere in the 1680s, Newton started reading up on the histories of Assyria, Greece, Egypt, and other Mediterranean civilizations. Although he initially made use of the libraries of various other Cantabrigians, he soon started to amass a wealth of books on history and chronology-related topics, including editions of most of the classics, and the works of contemporary scholars. Through careful study of his trademark habit of marking passages via dog-ears, and analysis of the hundreds of pages with notes he left, I trace what Newton took from these and other books and how he navigated back and forth between primary and secondary sources. I will also pay particular attention to how Newton took his notes, both in terms of form and function, and how those notes were subsequently incorporated in his writings.

[148] See e.g. *Orig. of Civ.*, 76-106, 239-45.

Around the time Newton left Cambridge for London, to take up his position at the Mint, he had significantly rewritten the ‘Origines’. From what was originally a short treatise on the Egyptian origins of star worship, he had expanded it several times to include a full comparison of the pantheons of the major Mediterranean civilizations. From this, he concluded that the origins of all these nations lay with Noah and his progeny. In Chapter 3 I trace back the development of the ‘Origines’ and its various stages, by reconstructing its order of composition. I then turn to the writing, editing, and ordering methods Newton employed in his research, in order to understand how Newton continued his chronological studies throughout the late 1690s and early 1700s. I pay particular attention to two key writings, the ‘Original of Monarchies’ and the ‘Original of Religions’, which so far have been significantly misdated and misunderstood by Newton scholars. Informed by Newton’s writing and ordering practices, through a careful examination of the manuscript record I reconstruct the connections between these and Newton’s other chronological writings. The picture that emerges is one of continuity, both in writing and focus. Instead of discarding the ‘Origines’ for a more detailed study of the origin of civilizations, Newton in fact expanded his earlier tract. This has clear implications for our understanding of the connections between Newton’s writings, including his religious studies, and the reasons why Newton became interested in chronology in the first place.

In Chapter 4, I explore the origin of Newton’s chronological studies from the perspective of the visions from the book of Daniel which I introduced above. I discuss his studies of the prophecies and his interpretation of the four monarchies, and how Newton tried to harmonize the prophetic record with sacred and profane history. Through a careful examination of the gestation of the various chapters of the *Chronology of Ancient Kingdoms Amended*, I show how in particular the chapters on Assyria, Babylon, Persia and Medea emerged directly from Newton’s studies of the prophecies, and how at some point he combined what were until then related but distinct projects. I also pay particular attention to how Newton tried to harmonize classical and sacred history, and how he applied a literary criticism to Biblical chronology that exceeded that of many of his contemporaries.

The final chapter is devoted to the study of the Corpus Newtonicum. I examine the editorial history of the posthumously published *Chronology* and the *Observations*, which has so far been shrouded in mystery. I show that despite the availability of all of Newton's religious and chronological manuscripts, the editors did not have the capacity to scrutinize these writings to the extent historians have today, not least due to Newton's rigorous editing and ordering practices. Although his manuscripts are now held all over the world, their availability has dramatically increased thanks to the digitization practices of their host institutions, and in particular through the transcription efforts of the online *Newton Project*. Scholars can now access Newton's writing in unprecedented ways, analysing what were once the private writings of an extraordinarily reclusive individual. By examining a number of examples from his digitized archive and from the physical remains of his textual studies, I demonstrate how we can use sophisticated database and analysis techniques to connect non-digital and digital resources, allowing us to both zoom in on the most minute of details, and to zoom out to observe the bigger picture of Newton's chronological writings. Moreover, by integrating into this dataset those manuscripts that are still in the process of being transcribed, and comparing them with my notes on the thousands of dog-ears and other reading traces contained in the chronology-related books from his library, I have connected digital and material culture. Combined with techniques for digital analysis and online repositories, my research sheds an unprecedented light on both the macro structure of Newton's chronological project, and the minutiae of his working practices. The fact that so many of his writings, which have ended up in libraries and collections all over the world, are now reunited via digitization and transcription efforts, enables us to open the door to his room, as it were, enter, sit down, and observe a scholar at work.

2. Reading Classics

2.1 Introduction

Isaac Newton was rather busy during the mid-1680s. His amanuensis at the time later recalled how he devoted ample time to alchemy, a testimony backed by countless notes and excerpts from alchemical treatises, and by the experiments he recorded in his notebooks.[149] Likewise, the manuscript record shows he must have spent thousands of hours studying the prophecies in Scripture, as well as the history of the church, with particular attention to the Arian controversy of the fourth century CE. The middle of the decade was, most likely, devoted entirely to the *Philosophiae Naturalis Principia Mathematica* (1687), the work that would grant him instant fame. And then there were what one might call his extracurricular activities, vehemently resisting James II's attempts to make a Benedictine monk Master of Arts at Cambridge, and taking up his seat as Member of the Convention Parliament in 1689.[150] Still, he found time to work on another project, the study of chronology, and with great zeal. Initially known to no more than a handful of intimates, it was a project that he worked on for the rest of his life, eventually leading to the posthumously published *Chronology of Ancient Kingdoms Amended* (1728).

So far, most studies have focused on the content of these writings. Yet little research has been done into how he actually composed them. What books did he read, and how did he read these books? How are we to interpret the thousands of folios of notes and drafts he left, and how are these related to his reading practices and to one another? It is clear that Newton did not just own, but actually read most of these books, and, as I show in this chapter, he had access to many more chronological tomes. Even without taking into account the hundreds of thousands words he devoted to the topic, this alone is evidence that he took the topic

[149] Keynes Ms. 135, fols. 1-3, 5; CUL Mss. Add. 3973 and 3975.
[150] *Priest*, 294-98 and 354 ff.; *Never at Rest*, 473-83.

extremely seriously. Moreover, as the range and publication dates of these volumes show, it was not just a spur of the moment, a brief, passing phase in the 1680s, but a project that remained with him for the rest of his life. What these books and his notes also reveal is that Newton refused to engage with contemporary chronologists, but instead from the onset took an independent route. That same independence reveals itself in the way Newton approached these materials, and the conclusions at which he arrived.

This chapter begins with a discussion of the major chronology-oriented project Newton was working on during the 1680s and early 1690s, the 'Theologiae Gentilis Origines Philosophicae'. Drawing upon the works of both ancient and modern historians, here Newton set out to prove that all Mediterranean civilizations derived their ancestry and religion from Noah. Next, I turn to Newton's library, and inspect what books he used, and how he read them. I analyse the notes he took from these volumes and from those he consulted in other libraries. I show how his note-taking had nothing in common with the commonplacing practices of his contemporaries, gathering information for information's sake. Instead, Newton's notes served a direct and actual purpose: they were working notes, collected and used to answer particular research questions. The chapter concludes with some considerations as to what Newton's research methods tell us about his research, and how these should be perceived.

2.2 Reading for the 'Origines'

In the fall of 1683 or 1684, Newton enlisted the help of an assistant, Humphrey Newton, who would stay with Newton for about five years. The majority of the manuscripts in Humphrey's hand are related to the *Principia*, which occupied Newton from late 1684 to early 1687, but

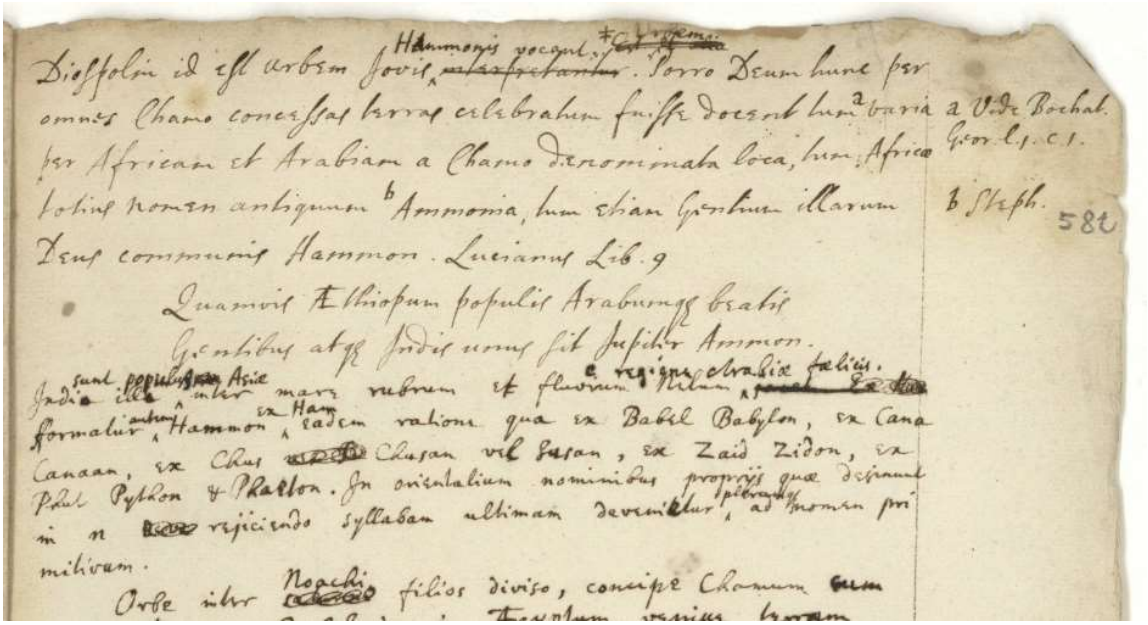


Figure 1. A page from the 'Theologiae Gentilis Origines Philosophicae'. The lines at the top of the page are in Humphrey's hand, with Newton revising a phrase in the first line and continuing the text. Yahuda Ms. 16.2, fol. 58r.

there is one that deals with wholly different matters.[151] In its present state it consists of eighty folios for a total of one hundred and fourteen pages, forty-three of which bear Humphrey's hand. On the first folio, Newton added the title 'Theologiae Gentilis Origines Philosophicae', 'On the (Natural) Philosophical Origins of Pagan Theology'; for brevity's sake I will refer to it as the 'Origines'. The parts in Humphrey's hand can be dated to between 1683–84 and 1688–89, although the drafts for these passages in Newton's hand might have been written earlier.[152] As can be seen in **Figure 1**, at some moment Newton took over writing from Humphrey, presumably after he had left. The top paragraph is in Humphrey's hand, but the corrections and the remaining text are all Newton's. The text itself is highly fragmented, with many passages and even entire folios occurring more than once, both in Humphrey's and Newton's hand, and it poses quite a challenge to anyone concerned with reconstructing the exact development of Newton's ideas. I will discuss the genesis and evolution of the 'Origines' in the

[151] *Never at Rest*, 402, 444; the manuscript is Yahuda Ms. 16.2. There are several other surviving manuscripts in Humphrey's hand, most notably Yahuda Ms. 9.

[152] Manuel suggested that one 'early' manuscript seemed to date itself, where Newton wrote '...and now in ye year 1680...'. *Historian*, 17; the manuscript is NCL Ms. 361.3, fol. 252v. However, the passage is part of a deleted paragraph for the *Chronology of Ancient Kingdoms Amended*, probably written not before 1725, and it is unclear how the reference should be interpreted. See *Chronology,* 85; Yahuda Ms. 25.2e, fol. 7r.

next chapter; here, I focus on its key arguments, to provide a background against which to discuss Newton's reading and note-taking practices.

2.2.1 'Theologiae Gentilis Origines Philosophicae'

The 'Origines' was first studied by David Castillejo, who catalogued the Yahuda manuscripts in 1969, and by Richard Westfall in the 1970s, who considered it Newton's most important theological work.[153] However, the 'Origines' contains more than theology. For one, it is a work of what we would call today comparative religion, in that it examined the similarities and differences between various ancient Mediterranean theogonies. In this historical tradition, which developed with and after Scaliger, historians like Walter Raleigh, John Marsham, and Samuel Shuckford would apply methods from chronology and linguistics to demonstrate that all religions had a common origin.[154] This origin was located within Judaism, placing particular emphasis on Noah and his sons; but throughout the seventeenth century works appeared, most notably John Spencer's *De Legibus Hebraeorum* (1683–85), that promoted a reversed causality: the Jews had derived elements of their religion from their Gentile neighbours and conquerors.[155] At times, these comparative religious studies were overtly polemical, in particular with Protestants aiming at the Catholic veneration of saints as having much in common with pagan ancestor worship and deification. In part, the 'Origines' was also a work of chronology, mapping the various histories of ancient civilizations onto sacred history and onto each other. Following the Euhemerized reading that was common in his days, Newton

[153] Dry, *Newton Papers*, 190; Westfall, 'Origines', 16. See also Castillejo, *Expanding force*. Westfall dated the *'Origines'* to late 1683 or early 1684, following Humphrey's appointment, but provides no evidence for this. See also *Never at Rest*, 351-56; Westfall., 'Theological Manuscripts', 136-38; Mandelbrote, 'Newton and Biblical criticism', 281-82 and 290-91; id., 'Newton reads the Fathers', 284-86; Knoespel, 'Interpretive Strategies', 181; *Orig. of Civ.*, 145-51.

[154] W. Raleigh, *Historie of the World* (London, 1614); Marsham, *Canon Chronicus*; Shuckford, *Sacred and Profane History*. See also P. Harrison, *'Religion' and the religions in the English Enlightenment* (Cambridge, 1990), 139-46.

[155] J. Spencer, *De Legibus Hebraeorum, Ritualibus et earum Rationibus libri tres* (Cambridge, 1683–85). See also D. Levitin, 'John Spencer's 'De Legibus Hebraeorum' (1683–85) and 'enlightened' Sacred History: A new interpretation', *JHCI*, 76 (2013), 49-92; id., *Ancient Wisdom*, 154-80.

understood the actors in these origin myths to be deified founders and heroes, who had subsequently been worshipped as gods.[156]

As the title 'Theologiae Gentilis Origines Philosophicae' suggests, Newton set out to discuss the (natural) philosophical origins of heathen religions, operating in a genre which had emerged during the first half of the seventeenth century through the works of John Selden, Gerardus Vossius, and Samuel Bochart.[157] From the outset he argued that the theology of the great civilisations of the past both in rituals and pantheons effectively mirrored and displayed their understanding of the cosmos, which he illustrated with an elaborate description of the sacred processions of the Egyptians, drawn from the *Stromata* of Clement of Alexandria (c. 150–c. 215 CE).[158] Not just the symbolism, but also the music played during these processions showed how the Egyptians understood the harmony of the celestial spheres. Newton continued by demonstrating from a myriad of sources how the twelve gods of the major theological systems could be mapped onto sacred history and onto the seven planets, the four classical elements, and the quintessence. Following contemporary scholars like Bochart, Edward Stillingfleet, and John Marsham, he first identified Noah with Saturn, which he then identified with the Roman god Janus, pointing at the parallels between the Biblical stories and Egyptian mythology. Together with arguments from comparative philology and etymology, throughout the 'Origines' Newton's main methodology made use of the identification of personae from different traditions based upon similarities in life and deed, a method used by many of his contemporaries.[159]

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[156] J. Seznec, *The survival of the pagan gods: the mythological tradition and its place in Renaissance humanism and art* (New York, 1953); F.E. Manuel, *The eighteenth century confronts the gods* (Cambridge, MA, 1959), 85-126; *Historian*, 103-21; *Orig. of Civ.*, 433 For a comprehensive treatment of Euhemerism, see M. Winiarczyk, *The Sacred History of Euhemerus of Messene* (Berlin, 2013), 27-69.

[157] See Levitin, *Sacred History*,pp. 1132-33; P.N. Miller, 'Taking paganism seriously: anthropology and antiquarianism in early seventeenth-century histories of religion', *Archiv für Religionsgeschichte*, 3 (2001), 183-209.

[158] Clement of Alexandria, *Stromata*, 6.4.35-37.

[159] *Orig. of Civ.*, 149.

As a general chronological framework, Newton, like others, used Ovid's four ages of mankind, as found in the *Metamorphoses*. Through these ages, Ovid told the story of the earliest history of the world and its inhabitants.[160] The Golden Age was a peaceful and prosperous age. There was no need for law, there were no wars, and food was plenty. It was an idyllic and Edenic state; this was the age of Saturn. During the Silver Age, the Earth was divided, the climate slowly became harsher, and seasons appeared. Men now had to shelter from the cold and heat, and toil the land; this was the age of Jupiter. Things became worse during the Bronze Age, with a race of men more prone to cruelty, until finally came the Iron Age, into which 'all evil burst forth… tricks and plots and snares, violence and cursed love of gain.'[161] Ovid was not the inventor of these four ages; he was following the Greek poet Hesiod, who recognised an additional Age of Heroes, between the Bronze and Iron Age, not included by Ovid. Hesiod, Ovid, and their ancient and modern commentators argued that each of these ages lasted for centuries. Ascribing the Golden Age to Saturn, then, did not have any implications for the length of the age, nor for the age of the persona of Saturn himself. In the 'Origines' however, Newton attempted to join Ovid's four Ages of Man with a Euhemeristic reading of the various mythologies – the Egyptian, Greek, Latin, Assyrian, Chaldean, and Babylonian – by identifying the various Jupiters, Saturns, and main figures of the Bronze and Iron Ages with one another, and most importantly with Noah and his progeny, thereby reducing each of the Ages to a single generation of rather well-defined length. It is here that Newton's approach differed significantly from established chronological practice. Bochart, in his *Geographia sacra, seu Phaleg et Canaan* (1646–51), had provided Newton with the identification of Saturn with Noah, but suggested the Golden Age began one hundred years after the Flood and lasted until the days of Phaleg or Peleg, who lived five generations after Noah. About this Peleg, Scripture said that 'in his days… the earth [was] divided', thus – in Bochart's reading – bringing an end to the

[160] Ovid, *Metamorphoses*, I.89-150.
[161] Ibid., I.128-31; trans. F.J. Miller, *Ovid III: Metamorphoses I, Books I-VIII* (Cambridge, MA, and London, 1971), 11.

peaceful Golden Age.[162] The Silver Age, which Bochart associated with Noah's son Ham, then lasted from Peleg to Nimrod – the great-grandson of Noah – whom he equated with the god Bacchus and whose war-like reign constituted the Bronze Age, which eventually led to the modern Iron Age in which mankind lived today.[163] Thus with Bochart, every age lasted for centuries if not millennia. Apart from the identification of main figures, such as Noah, Ham, and Nimrod, Bochart remained rather vague on how exactly sacred and secular history were related.

Newton, on the other hand, went to great lengths to map the various existing pagan origin myths onto sacred history. Foremost was the Titanomachia, the legendary battle of the Olympian gods against the giants, which survived mainly through Hesiod's *Theogony* and which Newton read in detail.[164] Identifying Noah with Saturn, Noah's eldest son Cham with Jupiter, and the rest of his progeny with other gods and goddesses, the Titanomachia now became embedded in, and identified with, events in sacred chronology. Following and quoting from the Greek historian Abydenus, whose work has been preserved mainly through fragments found in the writings of Eusebius, Newton argued that the Silver Age began with the confusion of tongues at Babel: 'Abydenus … goes on to say that the tower of Babylon was built by the first men and \soon/ thrown down by the winds, then adds that Men who had had one and the same language down to this time, afterwards spoke with many conflicting voices, and later a war broke out between Saturn and the Titans. And the whole period of the four first ages is occupied by these few things. For the second age takes its beginning from the

[162] Gen. 10:25; see also 1 Chron. 1:19.

[163] Gen. 10:25; S. Bochart, *Geographia sacra, cujus pars prior Phaleg de dispersione gentium & terrarum divisione facta in ædificatione turris Babel; pars posterior Chanaan de coloniis & sermone Phœnicum agit...* (Frankfurt, 1681 [1646-51]), 255-6. Bochart's work was originally published in two volumes, with the second volume, *Phaleg*, appearing first, in 1646, followed by the first volume, *Canaan*, in 1651. References are to the single volume edition of 1681 which Newton owned. He might have found Bochart through reading Edward Stillingfleet's *'Origines' sacrae: or, A rational account of the grounds of natural and reveal'd religion* (London, 1662).

[164] Newton's copy of *Poetae minores Graeci. Hesiodus, Pythagoras, Mimnermus*… (Cambridge, 1684 [1652]), edited by Ralph Winterton, shows many traces of reading, as I will discuss in § 2.2.4.

overthrow of the Tower, the third and fourth from the two wars of the Titans.'[165] Until now, Newton had still followed the pattern laid out by Bochart, but here their interpretations diverged. Bochart had situated the entire conflict between the gods and the Titans immediately after the confusion of tongues at Babel, at the beginning of the Iron Age. Newton agreed about the post-Babel timing, but he placed the two wars during the Bronze and Iron Age respectively, which in his interpretation meant the third and fourth generation from Noah. Since the Biblical record was all but silent about this period, Newton found ample room to fill in the histories of Ham's progeny and the wars they fought against their brothers.[166] Whereas Bochart understood the Iron Age to continue until Christ's second coming, with Newton it ended with Noah's great-grandsons.

The importance of the 'Origines' for Newton's chronological work, and our understanding thereof, should not be understated. By showing how the origin stories of all major Mediterranean civilizations pointed back to Noah and his progeny, Newton effectively contracted the history of these peoples to the timeframe allowed for by Scripture from the Flood onwards. As such, the 'Origines' served as a major building block for his later studies, culminating in the revised chronology presented in the *Chronology of Ancient Kingdoms Amended*. It also meant that all religions were derivatives of the Noachite religion. Although these religions had been corrupted through star worship and other forms of idolatry, they still contained the vestiges of the truth once revealed to Noah. Thus the religious rites of the Egyptians, with which Newton began the 'Origines', could be analysed for their symbolism and for the referents of those symbols. This constituted the wisdom of the ancients, a form of *prisca scientia*, which according to Newton included knowledge of heliocentricity, the inverse square law, and even universal gravity. It also expressed itself in the shape of the earliest temples or

[165] 'Pergit… Abydenus turrem Babylonicam a primis hominibus aedificatam dicere, ac ventis \mox/ subversam, deinde addit Homines quorum ad id tempus una eademque lingua fuerat, multiplicem ac discrepantem ex eo vocem emisisse ac postmodum Saturnum inter ac Titana bellum esse conflatum: Atque his paucis intervallum aetatum quatuor primarum comprehendit. Nam aetas secunda ab eversione Turris, tertia et quarta a duplici Titanū bello exordium ducunt.' Yahuda Ms. 16.2, fol. 52^{r}, underlining in the original. The quotation is from Eusebius, *Praeparatio Evangelica*, 9.14.

[166] See *Orig. of Civ.*, 148-50.

prytanea: circular, with a perpetual fire at their centre and thus representing the sun at the centre of the cosmos; I will return to this in Chapter 3.[167]

So far, I have been referring to Newton's earliest chronological work as 'the' 'Origines', with the emphasis on *the*, following all other authors who have discussed the work. However, the singular is misleading, as the eponymous manuscript, which is in significant disarray, contains multiple versions of a single treatise. Various sections occur more than once, and not just between the parts in Newton's hand and the scribal copies made by Humphrey. There are at least three – partially distinct – versions of the 'Origines' in Humphrey's hand, and that is before Newton started to rework the entire treatise by adding chapter headings and significantly expanding it. Through a career of some forty years, the 'Origines' took on various guises, eventually to be transformed into the *Chronology of Ancient Kingdoms Amended*. In the next chapter I will devote ample attention to the various stages of the 'Origines' and its successors. Here, I will focus on the materials Newton used as input for his research: the chronology-related books from his library and how he studied these.

2.2.2 Newton on a shopping spree

Shortly after Newton left for London, he drew up a list of books he sought to purchase; see **Figure 2**.[168] Included were a variety of volumes that dealt primarily with ancient history, most of which he ticked off suggesting he managed to acquire them. Indeed, all but six of these titles were found in his library upon his death, plus Samuel Bochart's *Hierozoicon* and *Historiae poeticae scriptores antiqui*, edited by Theophilus Gale, which appeared on the list but were not ticked off.[169] Perhaps he had misplaced the list, or simply did not care to update it anymore.

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[167] *Priest*, 199-203.

[168] NCL Ms. 361.2, fol. 75^{r-v}.

[169] These include Hermann Witsius' *Miscellanea Sacra* (Utrecht, 1683); *Phlegontis Tralliani Quae exstant, opuscula*, edited by Johannes Meursius (Leiden, 1620); Demetrius Moschus *Laconis hoc ad Helenam et Alexandrum, Poema* (?, 1519); Quintius Calabrius (Smyrnaios) *Derelictorum ab Homero* (various possible dates, but most likely 1539); the anonymous *Poemata Graece Argonautica, Thebaica, Troica & Ilias Parva* (Leipzig, 1588); and the 1630 Leipzig edition of Valerius Flaccus' *Argonautica*, of which Newton did own two other editions, including the one included on this list as 'Orphei

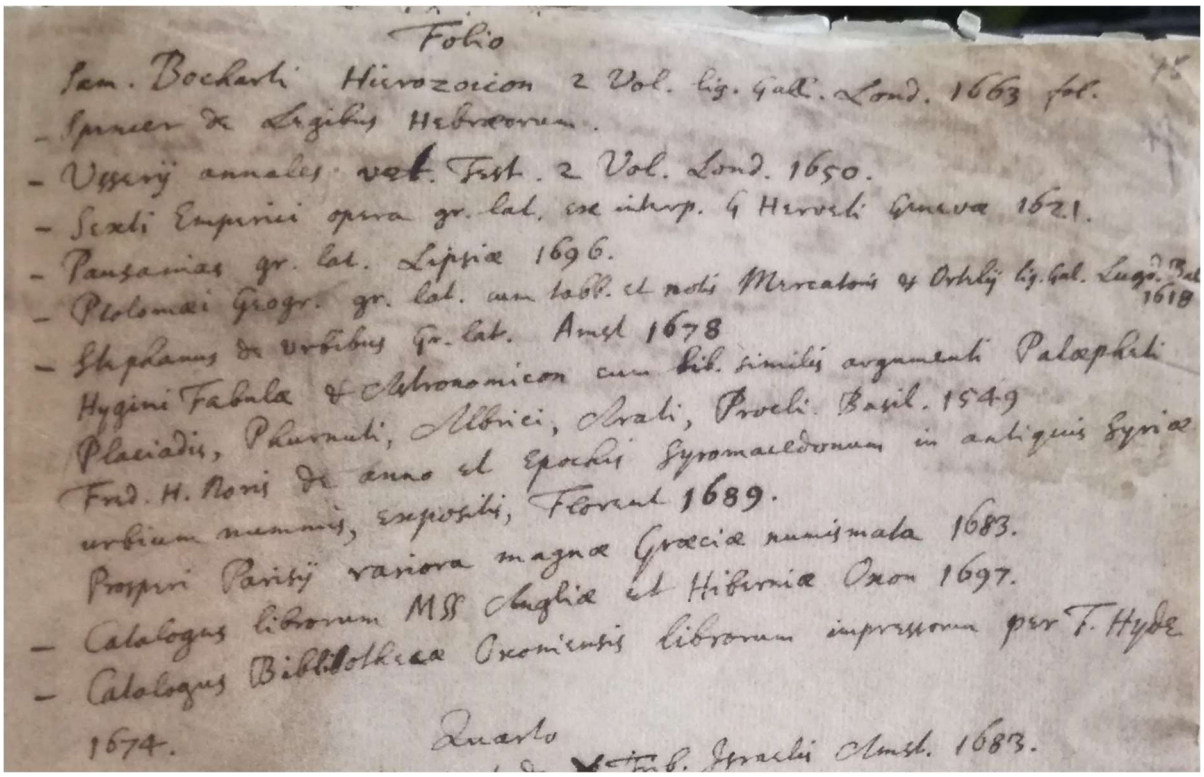

Folio
Sam. Bocharti Hierozoicon 2 Vol. lig. Gall. Lond. 1663 fol.
- Spencer de Legibus Hebraeorum.
- Usserij annales vet. Test. 2 Vol. Lond. 1650.
- Sexti Empirici opera gr. lat. ex interp. H Stephani Genevae 1621.
- Pausanias gr. lat. Lipsiae 1696.
- Ptolomaei Geogr. gr. lat. cum tabb. et notis Mercatoris et Ortelij lig. Gal. Lugd. Bat. 1618
- Stephanus de urbibus Gr. lat. Amst 1678
Hygini Fabula & Astronomicon cum lib. similis argumenti Palaephati
Placiadis, Phurnuti, Albrici, Arati, Proeli. Basil. 1549
Fred. H. Noris de anno et Epochis Syromacedonum in antiquis Syriae urbium nummis, expositis, Florent 1689.
Prosperi Parisij variora magnae Graeciae numismata 1683.
- Catalogus librorum MSS Angliae et Hiberniae Oxon 1697.
- Catalogus Bibliothecae Oxoniensis librorum impressorum per T. Hyde
1674.
Quarto
Amst. 1683.

Figure 2. Part of a list of chronological books, ordered by size, among Newton's papers. NCL Ms. 361.2, fol. 75^{r}.

There are two similar lists found among his manuscripts that likewise inform us of Newton's book purchasing, and are thus indicative of his academic interests at a particular time.[170] The first, drafted up by a bookseller in the early 1700s, contains a great deal of French titles under the heading 'Books for Mr. Newton'. These are mostly alchemical, but also include Jean Boizard's *Traité des Monoyes* (Paris, 1692) and *L'escalier des Sages ou la Philosophie des Anciens* (Groningen, 1689) by Barent Coenders van Helpen. There is only one work I cannot identify from Newton's library, 'Traité de Perspective', but I assume this to be Bernard Lami's *Un Traité de Perspective* (Paris, 1700). The list can be dated to between 1701, the publication date of Nicolas Venette's *Traité des Pierres*, and 1705, assuming the heading would have referred to Sir Isaac had the order been placed after 5 April of that year, when Newton got

Argonautica Gr Lat 1523'; see *Library*, 254. The author listed as 'Leon Conradus' is Leonardus Cozzandus; Newton owned his *Magisterio antiquorum Philosophorum*, published in Cologne, 1684 (not Geneva, as Newton wrote down), see ibid., 126; The volume listed as 'Arrianus' can refer to either *De expedit. Alex. Magni*… (Geneva, 1575) or *De rebus gestis Alexandri Magni*… (Leiden,1 1552), both by Flavius Arrianus and both in Newton's library, see *Library*, 9 and 90.

[170] NCL Mss. 361.2, fols. 78^{r}-^{v}, and 361.3, fol. 105^{r}.

knighted. The second list does not have any additional information with it and contains a variety of titles, including Thomas Lydiat's *Canones Chronologici* (Oxford, 1675), Johann Bayer's *Uranometria* (Ulm, 1655), and Johann Michael Vansleb's *The Present State of Egypt* (London, 1678), as well as Christiaan Huygens' *Systema Saturnium* ('s Gravenhage, 1659) and various alchemical works. One entry, Andreas Libavius' *Syntagma*, which can refer to either *Syntagma selectorum* (1611) or to *Syntagmatis arcanorum chymicorum* (1613), both alchemical treatises published in Frankfurt, has been struck through, and two entries, Libavius again and Gabriel Sionita and Ioanne Hefronita's *Arabia seu Arabum…* (Amsterdam, 1635) are preceded by a three-letter code added in the margin at a later moment. From the publication dates it is clear that the list must have been drawn up after 1688. Its purpose is not entirely clear, but it might be another list of works Newton at one time wished to purchase and subsequently did, as the catalogue of his library shows.[171]

Included in the list in **Figure 2** is a copy of the 1696 edition of Pausanias' *Graeciae Descriptio*, an author with which Newton had become very familiar by then. He had made good use of the 1613 edition for his studies for the 'Origines', but the move to London meant there was a need for a copy of his own.[172] At Cambridge, Newton had been able to use several other libraries, including the University Library and the recently established Wren Library in Trinity College. He would also have had access to the library of his predecessor in the Lucasian Chair, Isaac Barrow, and that of Humphrey Babington, who may have been instrumental in securing Newton's Fellowship at the College. Likewise, as Feingold has shown, after Barrow's death, in 1677, Newton acquired several books from his library.[173] With his move to London Newton

[171] The only book missing is the Libavius volume, which is incidentally also the single item Newton crossed out.
[172] See for example NCL Ms. 361.3, fol. 190^{r-v}, 'Ex Pausania'.
[173] *Never at Rest*, 83 n. 50, 177-80. Mordechai Feingold has shown that Newton likely acquired several volumes from Barrow's library after the latter died, in 1677; see M. Feingold, 'Isaac Barrow's Library', in id. (ed.), *Before Newton: the life and times of Isaac Barrow* (Cambridge, 1990), 333-72, esp. 336-38. D.T. Whiteside suggested Newton might have used Humphrey Babington's library in the rectory of Boothby Pagnell, quoting a passage from Newton's Trinity College Notebook: 'In summer 1665 being forced from Cambridge by the Plague I computed y^{e} area of y^{e} Hyperbola at Boothby in Lincolnshire to two & fifty figures by the same method [of Infinite series].' Whiteside, *Mathematical Papers*, Vol. 1, 8; the passage is from CUL Ms. Add. 4000, fol. 14^{v}.

did not leave just Cambridge behind, but also the books in its college and university libraries. Although he might have used the libraries of his London friends like Samuel Pepys, he also set out to expand his own. Apparently, foremost on his mind were books that dealt with ancient history. Apart from Pausanias, his shopping list included many ancient authors such as Ptolemy and Apollodorus, but also the works of his contemporaries John Spencer and Hermann Witsius. The fact that Newton did not engage with ancient and contemporary authors in the same manner is the topic of § 2.3. First, I examine his library for the chronology-related books he acquired, how he read those books, and what it tells us about Newton as a scholar.

2.2.3 On the topic of Chronology

Newton's library contained numerous books related to classical antiquity. Here were the works of Herodotus, the father of history, those of Tacitus, and Flavius Josephus. There was Thucydides' *De Bello Peloponnesiaco*, Strabo's *Geographia*, and the *Graeciae descriptio* of Pausanias. Newton also owned a copy of the *Antiquitatum* of Berosus the Chaldean, or rather of Annius of Viterbo, a collection of supposedly newly discovered writings of the third century BC Babylonian writer and several other authors – all forgeries, as discussed in the previous chapter. And then there were the thirteen volumes of Plutarch's collected works and many other massive tomes of edited Renaissance erudition, including plays, poetry, and mythology. Newton owned several copies of Horace's odes and poems, as well as of the works of Cicero. There were multiple editions of Homer's *Odyssey* and *Iliad*, and Ovid's *Metamorphoses*, with some of these dating back to his Grammar School and early undergraduate days. The one remaining copy of the *Metamorphoses*, a 1593 Frankfurt edition, bears the inscription 'Isaci Newtoni liber Octobris 15 1659. praetium -0-1-6' on the flyleaf. It is in fact one of the few books that Newton inscribed, providing detailed information on when exactly Newton purchased the book, and how much he paid for it. In particular the acquisition dates of his chronological books are of importance, as it allows us to map out the development of his interest in chronology;

although obviously not in this particular case – in 1659, a young Newton was simply purchasing required reading.

In between these classical volumes were the works of many authors I have discussed in the first chapter. There was Joseph Scaliger's *De Emendatione Temporum*, with his name appearing another four times as editor, for instance of the works of Marco Terentius Varro (1581), of Orpheus' *Argonautica* and *Hymni*, and his restoration of Eusebius' *Chronicon* in his *Thesaurus Temporum* (1606; Newton owned the second edition of 1658). There were various works by Gerardus Vossius, including his *De Theologia Gentili*, and by Dionysius Petavius, with both names returning frequently as editor and commentator. There was James Ussher's *Annales Veteris Testamenti*, amongst several other of his works. And then there were John Marsham's *Canon chronicus Ægyptiacus, Ebraicus, Graecus, et disquisitiones*, originally published in 1672, of which Newton owned the second edition of 1676, and Samuel Bochart's *Geographia sacra* (1646; Newton owned the edition of 1681). Both of these works were of considerable influence on Newton throughout his chronological career, as I will show below. There were also the less easily recognisable contributions by those whose names do not have the ring of a Scaliger or Vossius, but whose works were no less important to a seventeenth century chronologist, including Justus Lipsius' *Roma Illustrata* (1611), Nicolaas Heinsius' edition of Gaius Valerius Flaccus' *Argonautica*, the many works by Johannes Meursius on the history of ancient Greece, and the massive eight-volume *Bibliotheca Graeca* of Johann Fabricius.[174]

Apart from these, Newton also owned various thesauri, dictionaries and grammars related to the antiquities. There is the *Lexicon Graece et Latine*, a 10th century Byzantine dictionary and encyclopaedia drawing on ancient sources long since lost. Originally attributed to one Suidas, it is in fact of unknown origin, with the author's name mistakenly derived from the Greek title

[174] J.A. Fabricius, *Bibliotheca Graeca, sive Notitia scriptorum veterum Graecorum ... Graece & Latine, cum brevibus notis* (Hamburg, 1705-19). Newton's set, listed by Harrison as ten volumes, contained two copies of Liber IV (Tr/NQ.8.10 and 8.11) and of Liber IV pars altera (Tr/NQ.8.12 and 8.13), so it in fact contains nine books in eight volumes; see *Library*, 142.

Σοῦδα, Soûda, meaning 'stronghold'.[175] Newton owned two different editions of the lexicon, that of 1619 by Aemilius Portus, and the 1705 reworking by Ludolph Küster, the current whereabouts of both of which are unknown. The same is true of his editions of Henricus Stephanus' *Thesaurus Graecae Linguae*, Johann Alsted's *Thesaurus chronologiae*, and various other grammars such as Johann Buxtorf's *Epitome Grammaticae Hebraeae*.

The last category of books I consider here are works dealing not directly with the classics, or with classical histories, but with the manuscripts and objects on which these histories were based. Of these antiquarian works, Newton's library contained several on ancient numismatics, such as Jacobus Oiselius' *Thesaurus selectorum numismatum antiquorum* (1677) and Caspar Waser's *De antiquis numis Hebraeorum, Chaldaeorum et Syrorum* (1605). There were also volumes on ancient monuments, such as Guilelmus Bonjour's *In monumenta Coptica*… (1699), Bernard de Montfaucon's *Diarium Italicum* (1702) and, closer to home in time and place, William Stukeley's *An Account of a Roman Temple…* (1720). Another important volume in this category would be Humphrey Prideaux's revision of John Selden's catalogue of the Arundel Marbles, *Marmora Oxoniensia* (1676), which contained commentaries and analyses by himself and Thomas Lydiat, plus additional materials.

At first sight, the above summary appears a stock example of what one would expect to find on the shelves of someone with an avid interest in chronology. Primary sources, works by contemporaries, thesauri and dictionaries: all relevant instruments for a scholar immersed in debates about ancient and sacred chronology and the tensions between those, as I discussed in the previous chapter. Yet there were several noteworthy volumes that Newton did not own or no longer owned. Included with at least a dozen publications by his erstwhile protégé and successor in the Lucasian chair, William Whiston, was the anonymously published *A vindication of the New Theory of the Earth…* (1698), but not the original *A New Theory of the*

[175] The error is ascribed to Eustathius of Thessalonica (1110-1198) who refers to Suidas as an author in his commentary to Pindar, of which only the introduction survives; see P. Maas, *Der Titel des 'Suidas'*, *Byzantinische Zeitschrift*, 32 (1932), 1. Cf. R. Browning, 'Suda', *OCD*, which omits any reference to Maas' article.

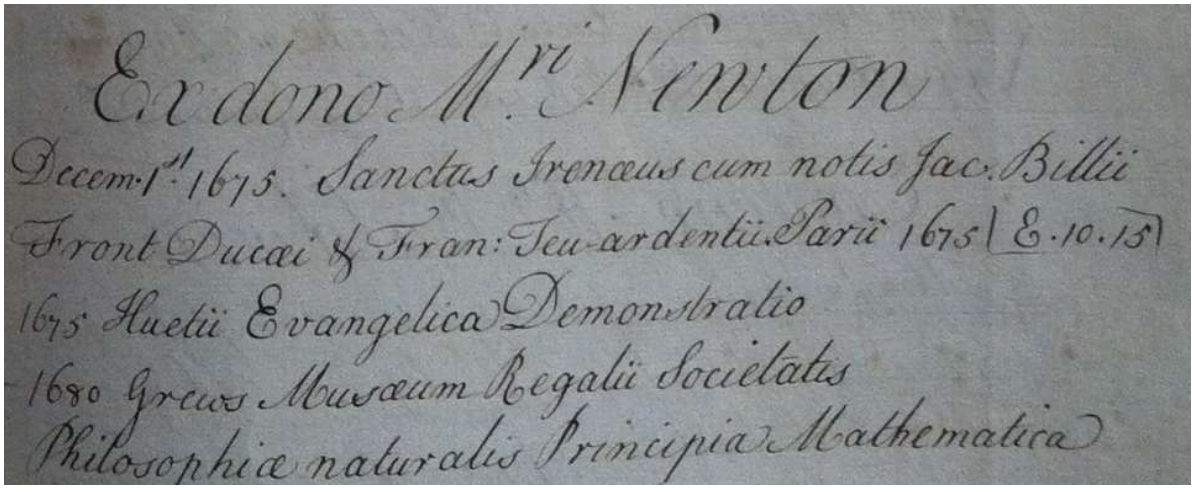


Figure 3. Four books donated by Newton to Trinity College Library. CUL Ms. Add. a. 110, fol. 123.

Earth (1696) which the pamphlet set out to defend. Isaac la Peyrère's *Prae Adamitae* (1655), Robert Cary's *Palaeologia chronica* (1677), Michael Maestlin's *Chronologicae Theses et Tabulae* (1646), Athanasius Kircher's *Oedipus Ægyptiacus* (1652–54), and Francis Tallent's *A View of Universal History* (1685) are other titles conspicuous by their absence. However, from his notes it is clear that Newton consulted Kircher's works, including *Oedipus Ægypticus*, whilst writing the 'Origines'; apparently, he did not consider the work worthy of purchase after he had moved to London.[176]

There are other books that at one time graced Newton's shelves but were no longer in his possession when he died. One such is Pierre-Daniel Huet's *Demonstratia Evangelica* (1679), which Newton used to some extent while writing the 'Origines'. He subsequently donated it to Trinity College Library, together with Nehemiah Grew's *Musaeum Regalis Societatis*, of which he owned another copy, and his own *Principia Mathematica*, see **Figure 3**.[177] It would not be

[176] For Newton referring to Kircher, see e.g. APS Ms. Temp. 3. Miss., fol. 19; Yahuda Mss. 16.2, fols. 55^{v} and 66^{r}, 17.1, fol. 3^{v}, 17.2 fol. 28^{r}; see also § 3.2.2.

[177] Years before, Newton had already presented his budding College Library with a copy of the works of Irenaeus, according to CUL Ms. Add. a. 110, fol. 123, one of the oldest catalogues of the Wren Library (ca. 1740s). The first half of the ledger is taken up by an alphabetical register with book title, size, place and year of publication, and in some cases what might be a shelfmark. These entries are followed by a list of donors and the books they donated. The first entry under 'Ex Dono Mri. Newton reads: 'Decem. 1st 1675, Sanctus Irenaeus cum notis Jac. Billii Front Ducaei & Fran: Feu-ardenti, Parii 1675', which I take to be the same edition as the one found in his own library, Irenaeus' *Adversus Valentini, & similium Gnosticorum haereses, libri V.... Cum scholiis & annotationibus J. Billii, F. Ducaei, & F. Feu-ardentii. ...* (Paris, 1675); see *Library*, 167. The December 1st reference suggests

the only donation of books Newton made during his life: as William Stukeley recounted in his *Memoirs*, Newton in early 1720/21 joined the literary society at Spalding and 'made them a present of books, desirous of encouraging every laudable attempt to promote learning, in any branch.'[178] From these two examples it will be evident that one must treat the catalogue of Newton's books as non-exhaustive: it is not comprehensive as a record of all the books he *had* owned.

2.2.4 How Isaac Newton read his books

In their classic study of how the Cambridge scholar and writer Gabriel Harvey (1552/3–1631) read his copy of Livy's *History of Rome*, Anthony Grafton and Lisa Jardine showed the importance of annotations for the history of reading.[179] Through these annotations, the historian can get an understanding of how the reader received and perceived the text. Alas, Newton hardly ever annotated his books. They bear the odd underlining, a few marginal pointing hands, the occasionally remark, but often no more than that. There are a few notable exceptions such as his copy of George Starkey's *Secrets Reveal'd*, an alchemical treatise published under the pseudonym Eyraeneus Philaletha Cosmopolita, and his edition of Lazarus Zetzner's *Theatrum Chemicum*, both of which are littered with annotations and interlinear textual corrections.[180] Similarly, Newton copiously filled the margins of one of his Bibles with

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that Newton bought two copies of the volume (for 14 shilling each, according to the inscription on the flyleaf of the copy still in Newton's library) and donated one to the library. The list of books donated by Newton must have been drawn up several years later, and in one go, as is apparent from the layout of the pages, with Huet's volume erroneously listed as '1675 Huetii Evangelii Demonstratio'; the title is reversed, and the year should be 1679. Cf. Westfall who suggests Newton contributed the Irenaeus, Huet, and Grew volumes between 1675 and 1680, whereas I argue that at least the Huet volume must have been donated years later, since Newton studied it for the *'Origines'*; *Never at Rest*, 337. See Yahuda Ms. 13.3, fols. 11^{r}, 13^{r}-^{v}, Yahuda Ms. 17.2, fol. 78^{r}.

[178] RS Ms. 142, fol. 9^{r}.

[179] L. Jardine and A. Grafton, ''Studied for Action': How Gabriel Harvey read his Livy', *Past & Present*, 129 (1990), 30-78; J. Scott-Warren, 'Harvey, Gabriel (1552/3-1631), scholar and writer', *ODNB*.

[180] Newton's copy of Zetzner has not been retrieved, but the auction catalogue makes mention of 'numerous annotations, textual correction and references' and two of the six volumes being 'very copiously annotated'; see *Library*, 249. The Starkey volume is now Duveen D 1328a, Memorial Library of the University of Wisconsin-Madison; see also *Library*, 235.

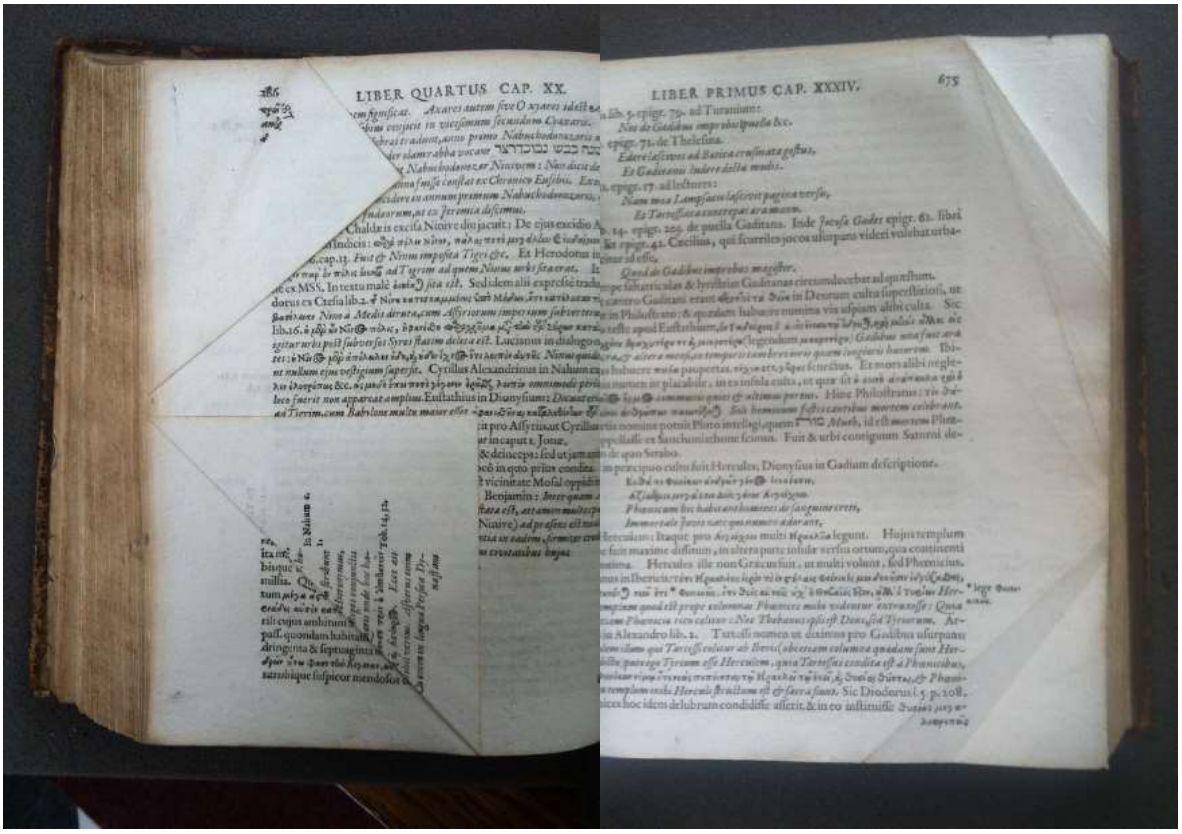


Figure 4. Examples of dog-ears found in abundance among the books in Newton's library, in this case in his copy of Samuel Bochart's *Geographia Sacra*. The dog-ears on the left are still present and point at two specific passages. The page on the right shows several dog-ears – pertaining to both sides of the page – that were once folded but have been straightened out.

references to other Scriptural passages.[181] However, these are all exceptions. In general Newton's books do not contain any annotations, underlining, or other written ways that inform us what he was interested in.

It is by now well known that Newton used another method to mark passages to which he wanted to return. Whereas other readers would perhaps insert a slip of paper, or make a small dog-ear, Newton's trademark fold has the tip of the page pointing at a specific word or passage, as can be seen in **Figure 4**.[182] Through careful analysis of those dog-ears still present and by reconstructing the ones that have been folded back, it is possible to retrace exactly which passages Newton was interested in. However, one has to be careful: all dog-ears are folds, but not all folds are dog-ears. In particular folds that are repeated on

[181] See id., 235, 249.
[182] Ibid., 25; S. Mandelbrote, *Footprints of the lion: Isaac Newton at work* (Cambridge, 2001), 43; *Orig. of Civ.*, 225.

subsequent pages are suspicious, and have most likely occurred during the binding process. In general, these folds can be easily distinguished from genuine dog-ears, of which there are often more present than visible at first glance. In his seminal work on Newton's library, Harrison carefully marked the presence of dog-ears in a particular volume. Sometimes he would note down exactly which pages had been folded, in other cases he simply gave the number of dog-ears he had discovered, often followed by 'and many other traces of reading' or 'many other similar signs'. Quite a few of these 'other traces' are indeed dog-ears, now folded back. For instance, in Newton's copy of Samuel Bochart's *Geographia Sacra*, Harrison lists 58 dog-ears, but are there in fact close to two hundred, evidence of Newton's voracious perusal of the volume. Similarly, Harrison mentions only a single dog-ear 'and several other signs of dog-earing' in the works of Macrobius, but there are over sixty. Newton's copies of Johann Meursius' *Theseus* and Humphrey Prideaux's *Marmora Oxoniensa*, both listed in Harrison as showing 'a few signs of dog-earing', contain respectively 31 and 66 pages that were once or are still folded. And then there are volumes with dog-ears where Harrison does not list any at all, such as Newton's copy of Plato's *De Respublica*, which contains well over a hundred.[183]

That Newton's dog-ears are not just arbitrary folds marking a page but in fact point at specific passages becomes clear when inspected in conjunction with his note-taking practices. For example, in the introductory paragraphs of the 'Origines', Newton described the sacred processions of the Egyptians and their cosmological meaning.[184] In an aside, he mentioned how Cicero considered the outermost sphere the place where God resides and upholds the other spheres.[185] This passage is referenced as 'Macrobium Somn. Scip. l. 1. c. 17'. On page 70 of his copy of the works of Macrobius, book 1, chapter 17, there is a dog-ear pointing at the exact same passage, part of the author's commentary on Cicero's *Somnium Scipionis*, the *Dream of Scipio*; see **Figure 5a**. Likewise, in a marginal addition to the main text of the

[183] *Library*, 105, 185, 187, 192, 218.
[184] Yahuda Ms. 16.2, fols. 1^{r}-2^{r}.
[185] 'Cicero dicit esse summum ipsum Deum arcentem & continentem caeteros orbes.' Ibid., fol. 1^{v}.

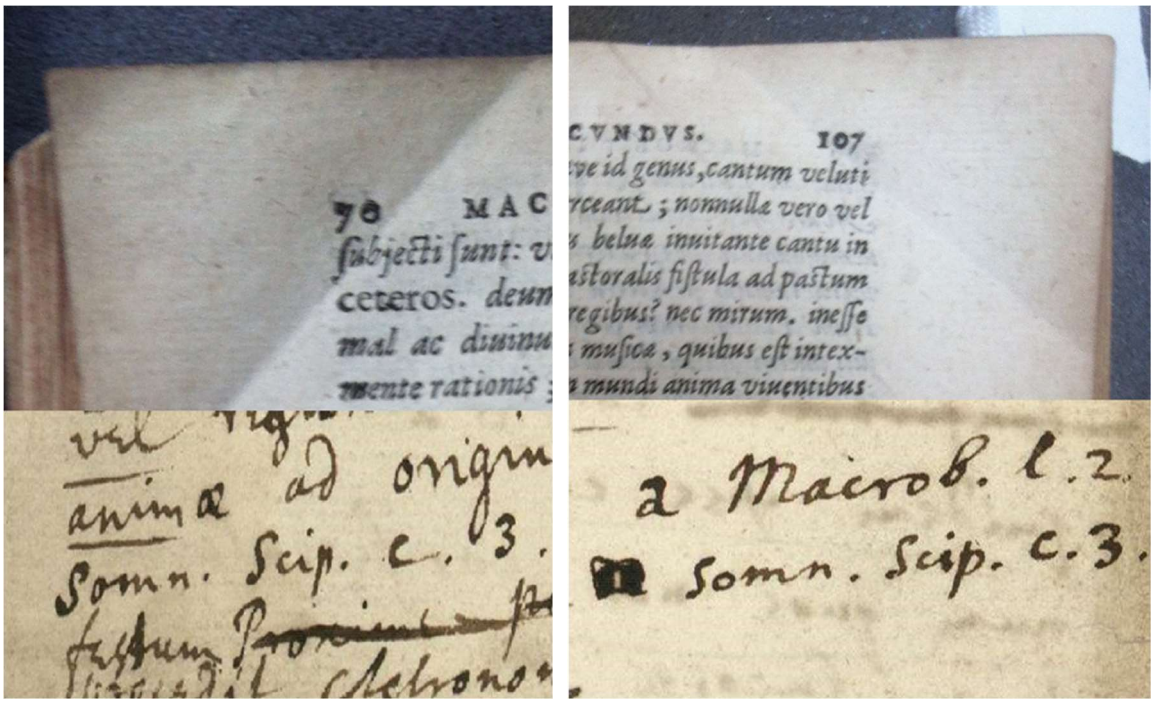


Figure 5 a and **b.** Two examples of dog-ears found in Newton's copy of Macrobius, with corresponding references in the *'Origines'*. Although many of the dog-ears in this volume have been folded back, their traces are clearly visible. Mind also the second dog-ear on p. 107, above 'secundus', which is in fact the ridge of a dog-ear on p. 108. Yahuda Ms. 16.2, fols. 1^{v} and 2^{r}.

'Origines' there is another Macrobius reference concerning the singing during burial processions, meant to guide the souls of the dead; see **Figure 5b**.The reference is to book 2, chapter 3, and again there is a dog-ear pointing at the relevant passage on page 107. Newton's dog-ears then pointed directly, not just at pages, but at passages he considered important. Many of these returned in his writings, often verbatim, both with appropriate referencing and – as I will show in § 2.3.3 – without.

Of Newton's chronology-related books, there are quite a few that show no dog-ears or other reading traces whatsoever; which does not mean he did not read them. There are many volumes that Newton most definitely used, such as dictionaries and reference books, which do not contain his trademark folds. Take Bayer's star catalogue, *Uranometria*, which has handwritten names with most of the constellations, in a hand that could be Newton's, but no dog-ears. From his writings it is clear that Newton made extensive use of the volume, referring to stars and constellations using Bayer's system.[186] Obviously, with most reference books and

[186] See e.g. *Chronology*, 88-90, which has ten references to Bayer.

dictionaries, there is often no need for bookmarking or referencing; they are tools involved in accessing and processing information gained from other sources. Sometimes Newton did provide clues as to how he used these books, as with Johann Buxtorf the Elder's *De Abbreviaturis Hebraicis* (1613). A list of notes taken from this and several related volumes shows that Buxtorf provided Newton not only with the correct interpretation of several Hebrew abbreviations, but also with valuable information about the Jewish feasts of Passover and Tabernacles.[187]

Before I move on to Newton's note-taking practices, there is one more detail Newton's books provide. From their publication dates, one can infer *termines post quem*, the dates after which he must have purchased or used particular books or editions. With chronology-related volumes printed after about 1690, it is safe to assume that Newton bought them shortly after they came out, since their publication dates coincide with his writing on the topic. It is obviously more difficult with those books published earlier. Here one needs the manuscript record to see when references to these works appear. For instance, as the many dog-ears show, Newton made extensive study of Humphrey Prideaux's *Marmora Oxoniensia* (1676). References to the volume are scarce, and none are found among the materials related to the 'Origines'. But it is clear he consulted Prideaux when he prepared a chapter titled 'Original of Monarchies', the oldest version of which he composed during the first decade of the eighteenth century. It is therefore highly unlikely that he used the volume when preparing the 'Origines'; he probably purchased it in the late 1690s. Similarly, the publication dates of his copies of the works of

[187] Yahuda Ms. 28e, fols. 2^{r-v}. Newton did not own a copy of Buxtorf's *De Abbreviaturis Hebraicis*, but he might have used the edition available in the Wren Library at that time; see CUL Ms. Add. a. 110, fol. 7.; the edition is listed as 'Basil, 1630', but this should be either 1613 or 1640. For Buxtorf the Elder and Younger, and their works, see F.E. Manuel, *The broken staff: Judaism through Christian eyes* (Cambridge, MA, and London, 1992), 82-92. See also Schilt, 'Hints of Things', 70-71; R. Delgado-Moreira, ''What Ezekiel Says': Newton as a Temple scholar', *History of Science*, 48 (2010), 153-70, esp. 155. For Newton's understanding and use of Hebrew, see M. Joalland and S. Mandelbrote, 'Isaac Newton Learns Hebrew: Samuel Johnson's Nova Cubi Hebraei Tabella', *NRRS*, 70 (2016), 9-21, esp. 16-17.

Gerardus Vossius range from 1617 to 1651; he may have acquired them anytime during his life.

2.3 Notes and records

The history of early-modern reading and note-taking has received ample attention over the past decades. Ann Blair, Anthony Grafton, Lisa Jardine, and others have focussed on how scholars and natural philosophers of the period annotated their books, compiled commonplace collections, and exchanged their finds with others.[188] Yet studies on how reading and note-taking practices were subsequently transformed into writing remain scarce. Obviously, annotating and commonplacing both served different and distinct functions, not immediately connected with writing, if at all. The notes compiled in a commonplace notebook were often not a means, but a goal in itself, a form of good practice that would eventually benefit their owner. These collections of notes and references, ordered by topic, and compiled over years, served as a repository and as an information filing system.[189] As Blair has shown, this particular method of collecting data could lead to new insights, based on the juxtaposition of materials gathered from a plethora of sources.[190] As a clear example, she discusses the

[188] Noteworthy publications include A. Blair, 'Humanist Methods in Natural Philosophy: The Commonplace Book', *JHI*, 53 (1992), 541-51; id., *Too Much to Know: Managing Scholarly Information before the Modern Age* (New Haven & London, 2010); id., 'The rise of note-taking in Early Modern Europe', *Intellectual History Review*, 20 (2010), 303-16; A. Brendecke et al. (eds.), *Information in der Frühen Neuzeit: Status, Bestände, Strategien* (Berlin, 2008); G. Cavallo and R. Chartier (eds.), *A History of Reading in the West* (Cambridge, 1999); Daston, L., 'Taking Note(s)', *Isis*, 95 (2004), 443-48; M. Frasca-Spada and N. Jardine (eds.), *Books and the Sciences in History* (Cambridge, 2000); A. Grafton, *Worlds made by Words: Scholarship and Community in the modern West* (Cambridge, MA., and London, 1999); Jardine and Grafton, How Gabriel Harvey read his Livy; A. Johns, *The Nature of the Book: Print and Knowledge in the Making* (Chicago, 2014), esp. 380-443; K. Sharpe and S. Zwicker (eds.), *Reading, Society and Politics in Early Modern England* (Cambridge, 2003); M. Stolberg, 'John Locke's 'New Method of Making Common-Place Books': Tradition, Innovation and Epistemic Effects', *Early Science and Medicine*, 19 (2014), 448-70; E. Yale, *Sociable Knowledge: Natural History and the Nation in Early Modern Britain* (Philadelphia, 2016); R. Yeo, 'Loose Notes and Capacious Memory: Robert Boyle's Note-Taking and its Rationale', *Intellectual History Review* 20, (2010), 335-54; id., *Notebooks, English Virtuosi, and Early Modern Science* (Chicago, 2014).

[189] For a concise discussion of note-taking as an early modern form of information management, see Blair, *Too Much to Know*, 62-116.

[190] Blair, 'Humanist Methods', 542-48.

Universae naturae theatrum (Theater of all nature) of Jean Bodin, first published in 1596. Here, Bodin gathered information under common headers, for instance regarding heat. From data on combustion, humidity, and the burning temperature of materials, he subsequently derived an answer to questions such as why summer was less hot in the tropics compared with adjacent areas.[191] Richard Yeo in turn has drawn attention to Robert Boyle's apparently chaotic note-gathering practices, using loose sheets instead of notebooks.[192] Boyle did not adhere to commonplacing. He understood that collecting notes in an orderly fashion would help with memory but argued that the imposed order might be deterrent to understanding the materials.[193] Unlike Bodin, Boyle, and many others, Newton never reflected on his note-taking practices; but his several notebooks and the thousands of pages with notes dispersed throughout the manuscript corpus speak volumes.[194]

2.3.1 Newton's note-taking practices: form

With the possible exception of Gottfried Wilhelm Leibniz, no other early modern scholar left such a rich repository of reading notes and drafts as Newton. Dispersed throughout the corpus, there are approximately a hundred pages filled from top to bottom with notes related to just the 'Origines', and hundreds more that he compiled for his later chronological writings.[195] Some of these are loose sheets, bundled together or inserted in other manuscripts,

[191] Ibid., 546.
[192] Yeo, *Notebooks*, 151-73. See also M. Hunter and E. B. Davis, 'The making of Robert Boyle's *Free Enquiry into the Vulgarly Receiv'd Notion of Nature (1686)*', *Early Science and Medicine*, 1 (1996), 204-71.
[193] Yeo, *Notebooks*, 153.
[194] There have been a few studies of Newton's note-taking practices, mainly concerning his notebooks. See A.R. Hall, 'Sir Isaac Newton's Note-Book, 1661-5', *Cambridge Historical Journal*, 9 (1948), 239-50; J. E. McGuire and M. Tamny, *Certain Philosophical Questions: Newton's Trinity Notebook* (Cambridge, 1983); A.E. Shapiro, 'Newton's Optical Notebooks: Public Versus Private Data', in F.L. Holmes et al. (eds.), *Re-working the Bench: Research Notebooks in the History of Science* (Dordrecht, 2003), 43-65. The only survey of Newton's note-taking practices outside of his notebooks is J. T. Young, 'Isaac Newton's alchemical notes in the Royal Society', *NRRS*, 60 (2006), 25-34.
[195] Yahuda Mss. 13.3 fols. 1^{r}-20^{v}; 17.1 fols. 1^{r}, 2^{r}, 3^{r}-12^{v}; 17.2 fols. 1^{r}-^{v}, 24^{r}-^{v}, 26^{r}-^{v}, 29^{r}-31^{v}; APS Ms. Temp. 3. Miss., fols. 1-2, 4-23.

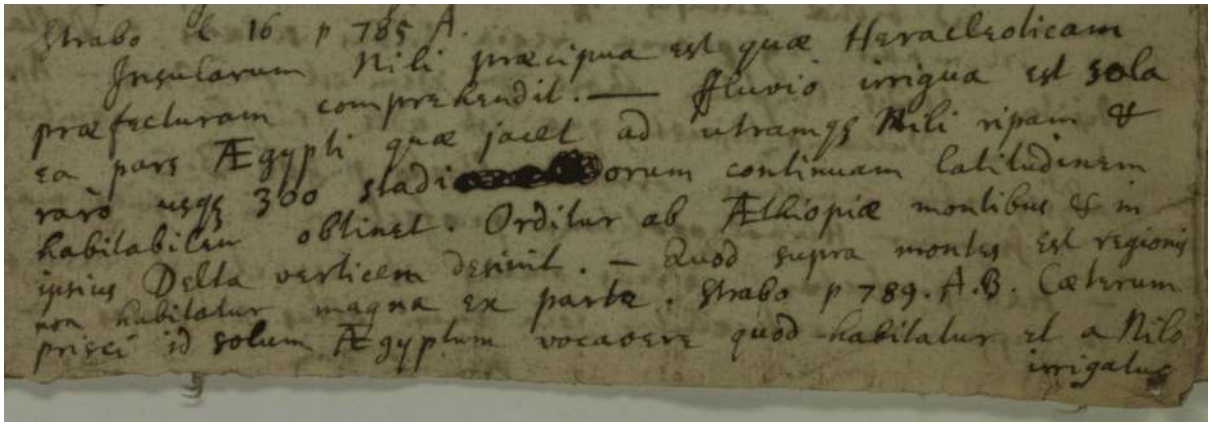


Figure 6. Newton abbreviating notes from Strabo's *Rerum Geographicarum*. Yahuda Ms. 17.1, fol. 3[r].

whereas others are composed of several folded folios, each forming a booklet of four pages.[196] The notes themselves vary immensely in length and focus. At times, they are rather staccato and contain just simple factual statements: 'The years of Cadmus were eight years Apollodor. l. 3. c. 4', 'Homer is the author of Jupiter's wars according to Justin Martyr', or even just 'Amazons. Pausan. Att. p. 100, 188, 356.'[197] Here Newton was collecting facts, expanding his knowledge, whilst also recording where he could find more about a particular topic. Other notes are much more elaborate, including long excerpts from Apollodorus and Lucian spanning multiple pages.[198] Often, Newton abbreviated parts of a quote, like those he took from Strabo's *Rerum Geographicarum*. As is clear from **Figure 6**, after paraphrasing the first couple of words, Newton wrote down 'Insularum Nili praecipua est quae Heracleoticam praefecturam comprehendit', 'The main islands of the Nile are contained in the prefecture of Heracleotis' followed by a dash, four more lines, another dash, and another two lines.[199]

[196] Yahuda Ms. 13.3 contains several of these booklets, which may or may not follow upon each other: 1[r]-4[v], 5[r]-8[v], 9[r]-12[v] (which Newton started on both sides, hence the text on 12[r]-[v] is upside down, with the recto following the verso), 13[r]-16[v], 17[r]-20[v], and 25[r]-28[v].

[197] 'Annus Cadmi erat annorum octo Apollodor. l.3.c.4', 'Jupiter bellorum author Homer apud Justin Martyr'; all Yahuda Ms. 17.2, fol. 1[r].

[198] See for example Yahuda Ms. 13.3, fols. 17[v]-18[v], and 19[v]-21[v], with both sections almost entirely covered by a single excerpt.

[199] Heracleotis or Herakleia, Greek: Ἡράκλεια (or Θῶνις, after its Egyptian name), an ancient Egyptian city mentioned also by Herodotus (*Histories,* 2.113-115) and Diodorus (*History,* 1.19.4), which flourished during the 6th – 4th century BCE. Its ruins were identified in 1999 in Abu Qir Bay of the coast of Alexandria. See F. Goddio, *The topography and excavation of Heracleion-Thonis and East Canopus (1996–2006)* (Oxford, 2007).

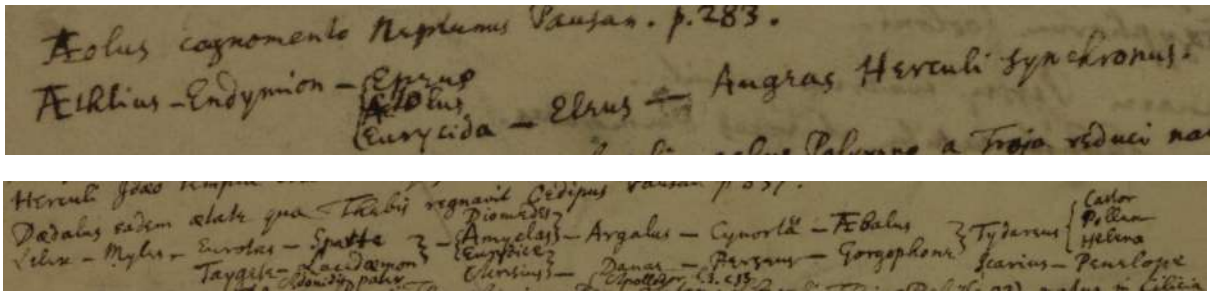


Figure 7 a and **b.** Different genealogical trees, drawn as reading aids. Yahuda Ms.17.1, fol. 1ʳ.

Making sure his note contained relevant keywords, Newton thus compressed half a column of text into three lines, with the reference, 'Strabo p 789 A.B.' referring to sections A and B of the text. In these and the surrounding passages, he mentally mapped out the geography of the Mediterranean, with Strabo as his guide. Clearly, these notes were not meant for quoting, but for indirect reference, and hence Newton saw no need to copy them in full.

In between notes, the chronological manuscript corpus contains various schematics. With so many different narratives from so many different histories and mythologies, Newton at times used small genealogical trees to clarify a situation, such as the ones found between notes from Pausanias' *Graeciae descriptio* (see **Figure 7**). As Newton read in Pausanias, Aethlius was a son of Zeus and first king of Elis, one of the ancient Peloponnese states, and father of Endymion, a handsome mortal with whom Selene, goddess of the moon, fell in love, and had fifty daughters. Endymion eventually married Asterodia and she gave him several children, amongst whom Epeius, Aetolus, and a daughter, Eurycida. According to Pausanias, she gave birth to Eleius, son of Poseidon and father of the Augeas whose stables Hercules had to clean as one of his twelve works, hence he was 'Herculi synchronus', contemporary with Hercules, as Newton added above in **Figure 7a**.[200] The second lineage, in **Figure 7b**, is much more elaborate, but again draws upon the materials Newton found in Pausanias, trying to visualise the often intricate relationships between the various dramatis personae. There are many

[200] Pausanias, *Graeciae descriptio*, 5.1.9.

similar examples among Newton's notes and drafts, ranging from the small-scale schematics in **Figure 7** to folio-size trees.[201]

2.3.2 Newton's note-taking practices: content

In general, Newton's notes can be grouped into two broad categories: source-related, and topic-related. Most of his notes were taken from a single volume, or from a single section within that volume. Here Newton interrogated a source about a topic he was keen to know more about, as with Plutarch's *De Iside et Osiride*, the second book of Strabo's *Rerum Geographicarum*, or the many notes from Eusebius to which I will return shortly.[202] He also studied Ralph Cudworth's *True Intellectual System of the Universe* in depth, making notes on all passages that referred to ancient philosophers like Plato, Aristotle, and Pythagoras, the origin stories their works contained, and their understanding of the world. Cudworth also argued that many of the works of these philosophers contained references to a corrupted form of the Christian Trinity, which they had learned from the Egyptians, who in turn had received the notion directly from the Hebrews – all of which Newton duly noted down.[203] At one point, he consulted the *Res Gestae* by Ammianus Marcellinus, possibly the 1693 Leiden edition by Gronovius, and not for its history of Rome. The notes taken from the volume involve a range of topics, from the reigns of Assyrian and Egyptian kings to Ammianus' claim that the Argo, the ship that carried Jason and his companions on their search for the Golden Fleece, was in fact the first genuine ship.[204] That Newton wrote down this fact shows that by the time he took these notes his mind was already set on dating the Argonautic expedition, which in the *Chronology* he used as a benchmark to calibrate his revised timeline.

[201] See APS Ms. Temp. 3. Miss., fol. 17^{r}, NCL Ms. 361.3, fols. 35^{r}, 79^{r}, 133^{r}-134^{r}; 216^{r}-^{v}, 218^{r}, 226^{v}.
[202] Ibid., fol. 1; Yahuda Ms. 17.1, fol. 3^{r}.
[203] WACL Ms. fN563Z, fols. 1^{r}-2v; TCL Ms. R.16.38, fol. 436A^{r}. See also D.B. Sailor, 'Newton's Debt to Cudworth', *JHI*, 49 (1988), 511-8; *Priest*, 137 ff.
[204] NCL Ms. 361.2, fol. 138^{r}.

There are also thematic or topical notes, where Newton was collecting information on a very specific, detailed subject, often from a variety of sources. In one series of notes he gathered data on ancient calendars from sources such as Censorinus, Herodotus, Geminus, Cicero, Pluto, Solinus, and Macrobius. It is unclear whether he consulted Scaliger's *De Emendatione Temporum*, but he definitely helped himself to these materials via Petavius' *Doctrina Temporum*, a practice which I will discuss in detail below.[205] Likewise, in his quest to map the various pantheons of the Greeks, Egyptians, and other Mediterranean civilizations onto Noah and his progeny, Newton began by recording how the various gods were related to each other. Here, he scavenged the writings of Eusebius, Plutarch, Macrobius, Herodotus, and others for lines such as 'From Jupiter and Juno were born Osiris, Isis, Typho \Venus/', which he found in Eusebius' rendering of Diodorus. In this case he also looked up an edition of Diodorus, since he added 'Osiris is the son of Jupiter Diodor. 1.1.' From the same volume he also recorded that 'Venus is the daughter of Jupiter', which he corroborated with a reference from Homer's Iliad.[206] At some point, he drew up a schematic diagram, ordering the various gods by generation; see **Figure 8**. At the top is Noah, the sole member of the Golden Age, and the names by which he was known by the Romans, Egyptians, Assyrians, and other Mediterranean peoples. The Silver Age was the age of his three sons Shem, Ham, and Japheth. Here Ham, known as Jupiter Hammon, is the key figure. Ham's progeny included Chus, known as Hercules, and six other sons and daughters. Finally, of the richly populated Iron Age Newton only included the offspring of Chus and Misraim. From his key argument that each of the four ages lasted for a single generation, and from the genealogies known in Scripture and in the various mythologies, he subsequently attempted to identify all the known deities of the Mediterranean world. Thus, for example, the Biblical Canaan had to be identical to the Roman god Vulcan, and to the Greek Titan Prometheus. Likewise, Noah's grandson Phut had to be the same as the Greek Titan Typhon and the legendary Erichthonius of Athens,

[205] Ibid., fol. 207^{r}.
[206] APS Ms. Temp. 3. Miss., fol. 16.

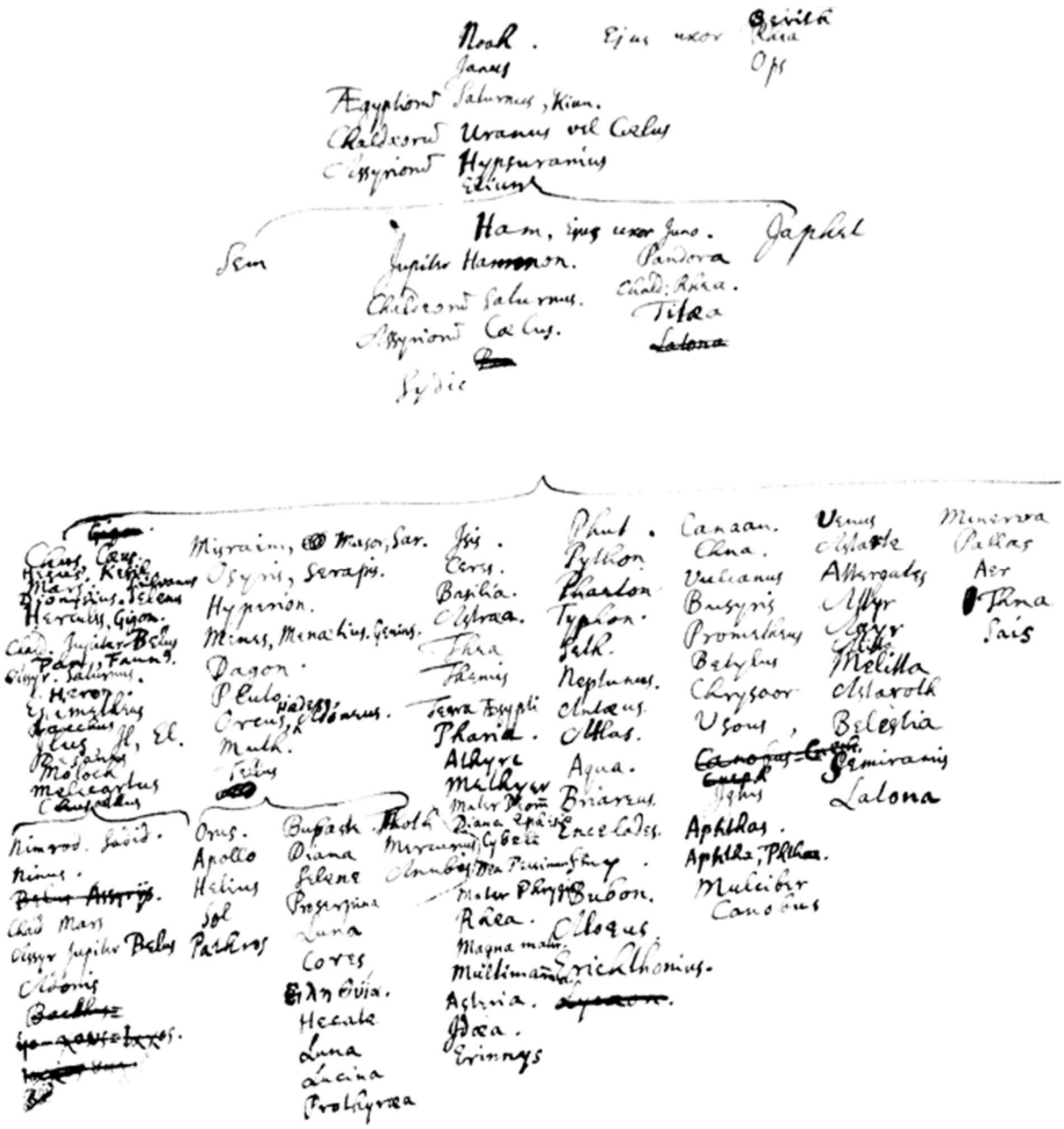


Figure 8. Newton's schematic ordering, by generation from top to bottom, of the plethora of gods he found in the various mythologies he compared. APS Ms. Temp. 3. Miss., fol. 17.

born from the seed of the god Hephaistos.[207] By reducing myth to history, and ages to generations, Newton was subsequently able to promote a much reduced timeline, which would become the backbone of the *Chronology of Ancient Kingdoms Amended*.

[207] That this Erichthonius is not Erichthonius of Dardania is clear from Homer, *Iliad*, 215-20, who referred to the latter as the son of Dardanos, son of Zeus, which would be the Roman Jupiter, thus placing him one generation later. Much later, in around 1717, Newton would argue that both were in fact one and the same person. See *Chronology*, 4-5 (from the *Short Chronicle*).

These and related materials would return in Newton's writings of the early eighteenth century, where he introduced methods from astronomy. There are even notes on topics seemingly far removed from his research, such as horses and horsemanship, again taken from a host of sources; until one realises that Chiron, who sailed on the Argo, was named 'the Centaur' and, according to Diodorus, '[t]he Centaurs [were] y^{e} first horsemen'.[208] Although the frequent occurrence of these thematic notes might suggest otherwise, Newton did not collect them in the form of a commonplace book. Instead, he used paper of all form and size, from full folios to reused envelopes and small snippets torn off from other pages, to compile these notes, presumably keeping them with his writing.

In one rather mysterious series of entries, Newton wrote down various mythologies about the Greek gods. Written in English, each paragraph starts with the god's name, followed by what appear to be arbitrary facts: 'Saturn was of large stature… Juppiter married his sister Juno…. Pluto is drawn by two dragons.'[209] None of the names seem written down in advance, as with a commonplace book, but he did reserve a number of lines underneath each header before moving to the next god. The entries on Cadmus, Perseus, and Theseus, are significantly longer than those of the other gods, with some receiving but a single line of text, or none at all. The last entry, Hercules, is likewise empty, as are the next two pages; with Hercules featuring prominently in all of his chronological writings, it seems he abandoned this set-up. What is remarkable about these notes is that Newton did not provide any references. It might be that he collected these materials from alchemical sources, some of which dealt with ancient mythology extensively, but the absence of references makes this unlikely. In addition, there are some enigmatic – or erratic – lines. Pluto (or Hades) is never drawn by two dragons: his chariot features four black horses. There is however an episode, known as the rape of Proserpine, where Proserpine (or Persephone), the daughter of Ceres (or Demeter), is being carried away by Pluto; but here it is Ceres whose chariot is drawn by two dragons, not Pluto.

[208] Ibid., fol. 250^{r}.
[209] Yahuda Ms. 13.3, fol. 21^{r}.

This story would have been well-known to him, and any other who had received a classical education, as is it recounted in the Homeric *Hymn to Demeter* and in Ovid's *Metamorphoses*.[210]

Thus, it appears that in these notes Newton was raking his memory about what had stuck with him from the classics, confusing Pluto's and Ceres' chariots, which he would not have done had he returned to Homer and in particular Ovid. Similarly, there are several passages where Newton left some space to fill in a particular detail which for the moment eluded him. For instance, in the entry on Perseus, Newton recalled how after a tumultuous wedding night, in which he had to fend off his wife Andromeda's suitors, Perseus returned to Argive where 'he restored his grandfather Acrisius whom his unkle had deposed.' Likewise, of the story of Jason and the Golden Fleece, Newton could only recall the name of his brother Peleus as one of the Argonauts; but he left space for several more names.[211] In a draft for the first chapter of the *Chronology*, Newton discusses the identification of the Egyptian Sesostris with the Greek Bacchus. If these were indeed the same, then 'two of his sons by Ariadne the daughter of Minos, namely & were Argonauts.' He subsequently looked up their names and filled them in; in the *Chronology*, they appear as Phylas and Eudemon.[212]

There are many more such passages among his notes and writings, where he would leave blank space to fill in details later. Often though, he would discard these drafts before he got around to consulting the appropriate sources. What this tells us is that Newton would frequently combine notes and memory. He would copy from his notes, or from a previous version, to then include materials he had come across elsewhere without having the exact text or reference available. For example, in a passage discussing the origin of the Titanomachia, Newton described from Plutarch, Diodorus and Herodotus how at one point during the war the

[210] The Homeric hymn, in Newton's days still ascribed to Homer, does not mention the dragons explicitly, but Ovid does, in *Metamorphoses* 5.643 ff. and 8.782 ff., as well as in *Fasti* 4.495 ff. See also N. Conti, *Mythologiae, sive explicationis fabularum…* (Cologne, 1612), 198-203.
[211] Yahuda Ms. 13.3, fol. 23^{r}.
[212] NCL Ms. 361.3, fol. 19^{r}; *Chronology*, 102, with Phylas misprinted as Phlyas.

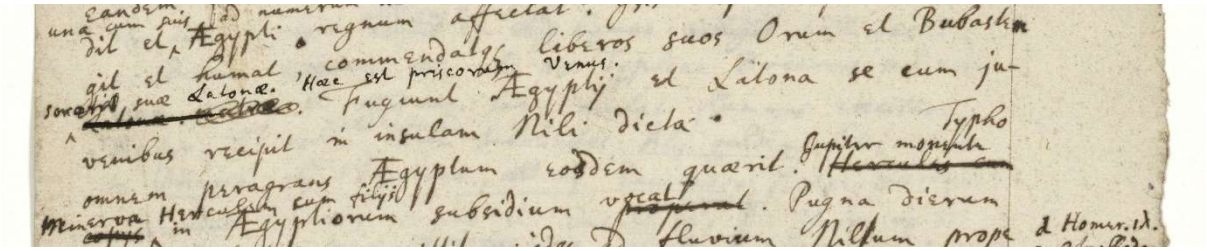


Figure 9. Describing how Latona with her grandchildren fled to an island in the Nile, Newton left blank space to fill in the name at a later date – which he never got around to. Yahuda Ms. 16.2, fol. 61^{r}.

Egyptian goddess Isis, whose husband Osiris had been slain by his brother Typho, entrusted her children, Orus and Bubastis, to her mother Latona. Latona and the children then fled to an island in the Nile, called – and here Newton left blank space, both in the additions to the text in Humphrey's hand and in two further draft versions, see **Figure 9**. From the included sources, all of which he consulted, it seems that Newton had come across the name of the island in yet another source, but could not remember it, or where he had found it exactly. He might have been searching for it whilst creating draft after draft, leaving blank space each time he copied and refined the passage.[213] Returning to his notes on mythology, these then seem to represent a very early stage in Newton's chronological studies, predating the composition of the oldest version of the 'Origines', as by then he clearly had consulted Homer and Ovid.

Featuring heavily among the notes are excerpts taken from Eusebius' *Praeparatio Evangelica*. A crucial work used by many of Newton's contemporaries, it contained many references to sources no longer extant, such as the writings of the Phoenician historian Sanchuniathon, various works of Porphyry, and parts of Diodorus Siculus' *Bibliotheca Historia*. It was a volume Newton knew well, having used it for his studies of Church history back in the 1670s – although there Eusebius' other works, in particular his *Historia ecclesiastica*, featured more prominently.[214] Starting with four pages of consecutive notes, Newton went directly for book 1, chapter 6, where Eusebius recounted the history of the gods: 'It is reported then that Phoenicians and Egyptians were the first of all mankind to declare the sun and moon and stars

[213] Yahuda Ms. 16.2, fols. 26^{r}, 32^{r}, 61^{r}; see also APS Ms. Temp. 3. Miss., fols. 1 and 9.
[214] See Yahuda Ms. 2.5b, fol. 50^{r}.

to be gods, and to be the sole causes of both the generation and decay of the universe…'[215] He then systematically recorded all passages from the first four books dealing with the various nations and how they perceived and named their gods, faithfully adding the original author where Eusebius quoted from another source, such as Sanchuniathon, Diodorus, and Plutarch. Some passages were recorded in full, others abbreviated by using dashes where one would use dots today. In between, there were various references to other works, such as to Josephus' *Antiquities*, but all taken from the *Praeparatio Evangelica*. He then moved to Diodorus and Plutarch, this time recording from the original sources as the very precise references indicate, for instance 'Diodor. lib. 1. part 2. cap. 2' or 'Diod. I 1 p 84'.[216]

It is clear that Newton tried to establish a framework for the history of the gods from the works of these three authors. In a series of short notes, he first summed up what Plutarch, Diodorus, and Eusebius, but also Macrobius and Flavius Josephus told about these ancient times.[217] Here were the identifications between the various pantheons, and between the gods and the elements, that Newton included in the first pages of the 'Origines'. In Josephus, Newton found an important passage that he would turn into a pivotal argument in his reconstruction of the history of Greece. According to the first century Roman-Jewish historian, Greek history was notoriously unreliable. Contrary to many other Mediterranean civilizations, the Greek city-states had never enjoyed a stable political climate, and their histories had likewise suffered. Having to build their civilizations from the ground up each time, they had often reinvented their own origins. Additionally, these histories had primarily been delivered in oral form, for want of a written alphabet.[218] As I will show in Chapter 4, Newton followed Josephus almost to the letter in his disdain for the historiography of the ancient Greeks.

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[215] 'Phoenices quidem et Ægyptios omnium principes Soli et Lunae ac Stellis divinitatem tribuisse vulgatum est, ijsque solis rerum omnium ortus interitusque causam assignasse &c.' Yahuda Ms. 13.3, fol. 1^{r}; the quotation is from Eusebius, *Praeparatio Evangelica*, 1.6.

[216] Yahuda Ms. 13.3, fols. 5^{r}-^{v}.

[217] APS Ms. Temp. 3. Miss., fols. 1-5.

[218] 'Cunctarum rerum junior apud Graecos est historiae conscribendae diligentia. Apud AEgyptios autem atque Chaldaeos & Phœnicas, sicut ipsi fatentur res gestae antiquissimam et permanentem

2.3.3 Second inventors…

So far, I have focussed on the notes Newton took from primary sources, either directly or via the works of other ancient authors like Eusebius. Yet the works of contemporary scholars, such as Bochart and Marsham, proved to be of no less value when it came to finding these primary materials. For example, the 'Origines' contained several lines of poetry from Lucan, taken from his *De Ammone*: 'However, there is only one Jupiter Ammon for the peoples of the Ethiopians and for the wealthy nations of the Arabs and for the Indians.'[219] These lines were preceded by a passage where Newton informed his reader that the god Ammon was worshipped throughout all the lands granted to Noah's son Cham by the various cities named after him in Africa, and here he included a marginal reference to Bochart's *Geographia*, book 1, chapter 1. In his notes, he wrote down a more precise reference, namely page 7, where the passage returns.[220] What also returns on that page, only a few lines down, is the exact same quotation from Lucan, explaining why both in the notes and in the *Theologiae Gentilis*, the reference is simply 'Lucan. l. 9.', as this is all the information Bochart provided. Newton did own a copy of Marcus Annaeus Lucan's *Pharsalia*, but its current whereabouts are unknown,

habent memoriae traditionem. Nam et locis omnes inhabitant, quae nequaquam aeris corruptioni subjacent: et multam providentiam habuere ut nihil horum quae apud eos aguntur sine memoria relinqueretur: sed in publicis conscriptionibus semper a viris sapientissimis diceretur. Graecorum verò regionem innumerae corruptiones invasere, rerum memoriam delentes. Qui autem novas constituentes conversationes, omnium se primos esse credidere sciant quia etiam serò & vix naturam potuere agnoscere literarum.' 'Just about the most recent of all for them is care in relation to the writing of histories. However, they certainly themselves acknowledge that matters to do with the Egyptians and Chaldeans and Phoenicians… enjoy an extremely ancient and extremely stable tradition of memorialization. For these all inhabit places which are least subject to the catastrophic effects of climate, and they have applied great forethought to leaving nothing of what happens among them unrecorded, but to have them consecrated continuously in public records composed by the wisest individuals. The region of Greece, on the other hand, has been affected by numerous catastrophes that have wiped out the memory of past events; and since they were repeatedly establishing new ways of life, the people of each period thought that their time was the beginning of everything, and it was late - and with difficulty - that they learned the nature of the alphabet.' Ibid., fols. 6-7, normalized; the quoted passage is from Josephus, *Contra Appion*, 1.2.

[219] Yahuda Ms. 16.2, fol. 14^{r} (also fols. 15^{r} and 58^{r}). 'Quamvis Æthiopum populis Arabumque beatis – Gentibus atque Indis unus sit Iupiter Ammon.' Lucan, *Pharsalia*, 9.518-19.

[220] Yahuda Ms. 17.2, fol. 28^{r}.

so it is unclear whether he looked up the original source.[221] A similar instance, on a more serial basis occurred in his notes from Iamblichus' *De mysteriis Ægyptiorum*. Seemingly cast as a research query about the symbolism of Egyptian theology – 'Theologia Ægyptiorum symbolica' – and its relation to genuine knowledge of the cosmos, from checking the references in Iamblichus and in the notes to *De mysteriis* by Theophilus Gale it soon becomes clear that Newton used but a single source for this passage, as he copied each and every reference directly from Gale.[222]

There were several titles in Newton's library that did not return in his writings, although he clearly read them – as the dog-ears in his copies testify – including Thomas Goodwin's *Moses and Aaron* (1631) and Thomas Burnet's *Archaeologiae philosophicae* (1692). Likewise, in his copies of Bochart and Marsham Newton marked hundreds of passages, yet only a relatively small selection of these returned in his notes. Clearly, most dog-ears were not meant to be turned into reading notes, or references. Whilst reading, Newton would have marked any relevant or interesting fact. Only when he picked up the volume a second time would he begin copying particular bookmarked passages, perhaps finding more in the process. Similarly, a dog-ear to a primary source in the works of a contemporary author does not necessarily mean Newton copied it from there. With many different authors often referring to the same historical source, one has to be careful in asserting a causal relationship between volume, note, and writing. Newton could have found a particular reference through other contemporary writers, or even directly in the original. For example, the fact that in his copy of Burnet Newton dog-eared various passages referring to Iamblichus' *De mysteriis Ægyptiorum* and to particular entries from the Suda, does not mean that Burnet had also been his source for these passages; his notes from Cudworth included references to Iamblicus as well.[223] It seems that

[221] Nor are any of the other references to Lucan helpful. In Yahuda Ms. 13.3, the two occurrences are 'Lucan. l. 1. de Dijs' (fol. 17^{r}) and 'Lucan. in Hercule Gallico' (fol. 19^{v}), whereas the second reference in Yahuda Ms. 17.2, found in a note to a deleted passage on fol. 8^{r}, is similarly vague: 'Lucan lib 1'. The 1651 Grotius-Farnabius edition Newton owned contained line numbers, so a more detailed reference would have been easily possible.

[222] APS MS. Temp 3. Miss., fols. 19-20.

[223] WACL Ms. fN563Z, fol. 2^{v}.

when reading new materials, he would dog-ear any passage that mattered, irrespective of whether he had already consulted it via another way.[224]

In order to prove that Newton did copy from a particular author, one has to dig a little deeper. In a passage from the 'Original of Religions', a later work which I will discuss in the next chapter, Newton included a quotation from Clement of Alexandria:

> Thus, it is not without reason that in the mysteries that take place among the Greeks, purification rites are the most important; just like the (ritual) bath among the Barbarians. These are followed by the minor mysteries, which provide some foundation of instruction and preparation for what is to come; and the great mysteries, in which nothing remains to be learned of the universe, but only to contemplate and comprehend nature and things themselves.

That he did not take this quote from the bilingual Sylburg edition of Clement's works he owned, read, and referred to, becomes clear from the Latin translation he provided, which at points differs significantly from that of the editor. It does however match John Marsham's translation word for word.[225] From these and other examples it is clear that Newton derived not only inspiration from contemporary authors, but literally copied their quotes and used them as if he had consulted the original sources himself.

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[224] Newton's copy of Burnet contains several dog-ears to passages from Iamblichus, e.g. on pages 81 and 85; on page 135 there is a dog-ear to the Suda. But then, there are also dog-ears in Newton's copy of Gerard Vossius' *De historicis Graecis* (Leiden, 1651) that point to the Suda, e.g. on page 3.

[225] The Latin of the edition Newton owned read 'Non abs re ergo in mysteriis quoque quae fiunt apud Graecos, primum locum tenent expiationes & lustrationes, sicut etiam apud Barbaros lavacrum. Post haec autem sunt parva mysteria, quae habent aliquod fundamentum doctrinae & praeparationis futurorum. In magnis autem de universis non restat amplius discere, sed contemplari & mente comprehendere & naturam & res ipsas.' Clemens Alexandrinus, *Opera Graece et Latine quae exstant…* (Paris, 1641), 528. Newton's (read: Marsham's) Latin was more interpretation than translation: 'In mysterijs Graecis... primo loco sunt expiationes, ut et lavacrum apud exteros: post has sunt mysteria parva, quae fundamentum aliquod habent doctrinae et praeparationis ad futura. Magna autem mysteria versantur circa universum. Non amplius dicendum [*sic*] est sed inspicienda et animo comprehendenda rerum natura,' which translates as 'In the Greek mysteries... purification rites come first, such as the bath among other nations. After these come the minor mysteries, which have some foundation of instruction and preparation for what is to come; and the great mysteries which revolve around the universe. Not to be learned, but to observe and comprehend the things of nature.' Yahuda Ms. 41, fol. 7^{r}; Marsham, *Canon Chronicus*, 255-56, or 267 in the 1676 Leipzig edition Newton owned, with dog-ear; see also Yahuda Ms. 17.3, fol. 9^{v}.

When it came to his contemporaries' interpretations of these sources, Newton was much more fastidious. His copy of Marsham is littered with dog-ears, yet most point to primary sources. Apart from a select number of critical inferences, such as the identification of the Egyptian king Sesostris with the Biblical Sesac, Newton seemed much more interested in the sources Marsham used than in his interpretation of them. That his readers picked up on this becomes clear from the comments of one anonymous reader of the *Chronology of Ancient Kingdom Amended*. When Newton related how 'Appian, in his history of the Punic wars, tells in round numbers that Carthago stood seven hundred years: and Solinus adds the odd number of years in these words: 'Adrymeto atque Carthagini author est a Tyro populus…'', he provided as a reference 'Solin. c. 30.', without further section or page number, to which the anonymous annotator added 'v. Marsham p. 409, 422. whence this computation is taken.'[226] I have not been able to identify the reader, but the reader had no problems in identifying Newton's source.

Apart from Marsham and Bochart, there are many other contemporary chronologists whose names appear in the notes Newton took for the 'Origines', such as Huet, G.J. Vossius, Selden, Kircher, and Scaliger.[227] Newton's use of Vossius' *De Theologia Gentili*, an elaborate and detailed taxonomy of pagan religious beliefs, shows the now familiar pattern of bookmarked sources, both primary and secondary.[228] Of the other authors listed above, it would seem that

[226] *Chronology*, 64-65, Huntington Library #700429 / Babson c. 5; from here on '*Chronology* [Hunt.]'.
[227] See Yahuda Ms. 13.3, fols. 7^{v}-16^{v}; for Huet see also § 2.2.3 above.
[228] *De Theologiae Gentili* is often seen as a historical commentary on Dionysius Vossius' *De Idolatria*, a translation of a work by Maimonides, by which it is preceded in most editions. Richard Popkin argued that Vossius' *De Theologia Gentili* was in fact written before Dionysius' translation, referring to 'scholarly evidence', alas without any sources. As can be deduced from the preface, Dionysius died before Gerard starting writing the volume. However, unlike in later editions, in the first edition of 1641 Dionysius translation was not printed at the beginning, but at the end of the volume, clearly as an addition to his father's work. R.H. Popkin, 'Polytheism, Deism, and Newton', in J.E. Force and R.H. Popkin, *Essays on the Context, Nature, and Influence of Isaac Newton's theology* (Dordrecht, 1990), 27-42, esp. 28; see also C.S.M. Rademaker, *Gerardus Joannes Vossius (1577–1649)* (Zwolle, 1967), 224; Cf. Levitin, *Ancient Wisdom*, 193 n. 408. For Newton on Maimonides, see in particular Yahuda Ms. 13.2, which contains extensive notes from Maimonides *De Culto Divino…* (Paris, 1678); Yahuda Ms. 24e, fol. 2^{v}, where Newton is referring to parts of *De sacrificiis, de Consecratione Calendrum et de Ratione Intercalandi* (London, 1683); and Yahuda Ms. 28e, fol. 1^{r} for references to *Porta Mosis, sive Dissertationes aliquot…* (Oxford, 1655).

at a certain point in his research, Newton consulted their works – or did he? Following three direct references to Vossius, with page-numbers that exactly match dog-ears in his copy of *De Theologia Gentili*, Newton indeed listed their names and writings.[229] However, upon closer inspection it turns out that these too are references, copied directly from Vossius. In between, he added notes-to-self reminding him to look up some of these materials: 'Consule Iornandem de Gothorum antiqua Philosophia… Huetij… Demonstrationes evangelicas. Pierij Hieroglyphica…' referring to Joannus Magnus' *Historia de omnibus Gothorum Sueonumque regibus* (1554), Huet's *Demonstratia Evangelica*, and the *Hieroglyphica* (1556) of Pierio Valeriano Bolzani.[230] With the exception of Huet's *Demonstratia*, it seems Newton did not follow up on his memo. He might have consulted any of these volumes, but they did not return in his library, nor did he take any notes from these authors or of any of the other secondary sources he found through Vossius.

2.3.4 The *Chronology of Ancient Kingdoms*, unfinished

It is not entirely surprising that Newton omitted references to the contemporary authors from which he took primary sources. These key passages would be considered basic building blocks for any scholar operating in the field of chronology. However, there are ample occurrences among the drafts for the 'Origines', the *Chronology of Ancient Kingdoms Amended*, and the various other chronological writings Newton composed, where he provided incomplete references to primary sources that he could have easily finished. For instance, in the *Chronology* Newton at some point included a reference to 'Plutarch, in Theseo', a reference which he took from Diodorus as the anonymous annotator of the Chronology pointed out.[231] What prevented him from completing the Plutarch reference when he owned and

[229] Ibid,. fols. 7^{v}-8^{r} and 10^{v}-11^{r}.
[230] Yahuda Ms. 13.3, fol. 11^{r}; G.J. Vossius, *De Theologiae Gentilii et Physiologia Christiana, sive de Origine ac Progressu Idolatriae...* (Amsterdam, 1641), 282 and 696, both with dog-ears. See also R. Popkin, 'The Crisis of Polytheism and the Answers of Vossius, Cudworth, and Newton', in Force and Popkin, *ECNI*, 9-26, esp. 20-23.
[231] *Chronology* [Hunt.], 100.

studied the original? Here it is important to realise that Newton left his chronological project unfinished: he was still writing when he died. Although a contemporary source suggested Newton was 'obscuring his proofs,' to the extent that the editors of the *Chronology of Ancient Kingdoms Amended* felt compelled to add a few marginal references of their own, there is in fact ample evidence that Newton was himself adding – not removing – references to the two manuscripts he considered for publication.[232] In a passage where he discussed the two lineages of Spartan kings, he included two incomplete references to Herodotus. Neither of these references appeared in earlier drafts, no matter how neatly written out, while these drafts do contain other references that did return in the final manuscripts.[233] Similarly, in a paragraph on ancient astronomy, Newton quoted from the Greek author Achilles Tatius (fl. 2nd century CE) that 'some antiently placed the solstice in the beginning of Cancer, & others in the eighth degree of Cancer, others about the twelft degree, & others about the fifteenth degree thereof.'[234] There are several drafts for this passage, but only one, a late draft, comes with a marginal reference to 'Isagoge p. 1'.[235] However, both manuscripts Newton was working on when he died have the expanded reference 'Isagoge sect. 23, a Petavio edit', referring not just to the primary source but also to the particular edition he used, and again demonstrating how Newton was adding, not removing, information.[236]

[232] Pearce, *Commentary on the Four Evangelists*, xliii. The two manuscripts are CUL Mss. Add. 3987 and 3988.
[233] CUL Ms. Add. 3988, fol. 16r; this the manuscript selected by the editors as copy-text. Drafts for this passage occur in NCL Mss 361.1, fol. 106r, and 361.3, fol. 2v, 177v; Yahuda Mss. 25.1aII, fol. 4r, 25.1aV, fol. 2r, 26.2 fol. 14r, and in CUL Ms. Add. 3987, fol. 17r.
[234] CUL Ms. Add. 3988, fol. 22r.
[235] Yahuda Ms. 26.2, fol. 5r. The other drafts are Yahuda Ms. 25.2e 7r, NCL Mss. 361.1. fol. 101r, and 361.3, fols. 185r, 252v.
[236] CUL Mss. Add. 3987, fol. 9r, and 3988, fol. 22r. The reference is to D. Petavius, *Uranologion sive systema variorum authorum…* (Paris, 1630). Apparently, Newton did not own a copy, which might explain why in NCL Ms 361.3, fol. 252v, there is a marginal reference to just 'c. 24', Newton presumably trying to retrieve from memory where exactly he had drawn the quotation. If this is true, it would be an impressive feat indeed.

2.3.5 Reading order

With Newton borrowing freely from secondary sources, it is tempting to assume that most, if not all of the materials taken from ancient historians arrived on his desk through his reading of contemporary authors. Yet, as I have shown, Newton consulted many primary sources directly, and sometimes cover to cover. Obviously, when he began reading for the 'Origines', he did not start with a blank slate. From his Grammar School and undergraduate days, he possessed a rudimentary knowledge of ancient mythology, and from his studies of Church history he had become familiar with the writings of Eusebius, Diodorus, and Clement of Alexandria. In general it is impossible to reconstruct the exact order in which Newton consulted particular primary and secondary sources, as his notes are dispersed over multiple manuscripts that cannot be easily ordered or dated. Likewise, most of the contemporary volumes he copied from were published before 1683, the earliest date we can assign to his chronological studies.

Fortunately, there are several folios that shine a light on the order in which Newton read his materials. **Figure 10** shows the final of fourteen consecutive pages of notes taken from Eusebius, Diodorus, Plutarch, and other ancient authors. Most, if not all of these, appear to be directly copied from the original primary source. At the bottom of the page, in a slightly darker coloured ink, Newton added three references to Vossius' *De Theologia Gentili*. From their location, it is clear that Newton consulted the primary sources first, and only afterwards read Vossius. The change of ink might indicate that some time went by before he wrote down his notes from *De Theologiae Gentili*, but this is of course speculation. This might seem counterintuitive, but most of the primary sources he recorded from returned in Eusebius *Praeparatio*, which he had first studied in the 1670s. It thus seems reasonable to assume he returned to the volume early in his chronological studies. This is also substantiated by the fact that the notes cover the entire work, and contain many passages abbreviated with dashes, suggesting Newton was still in the process of gathering data. From Eusebius, he then moved

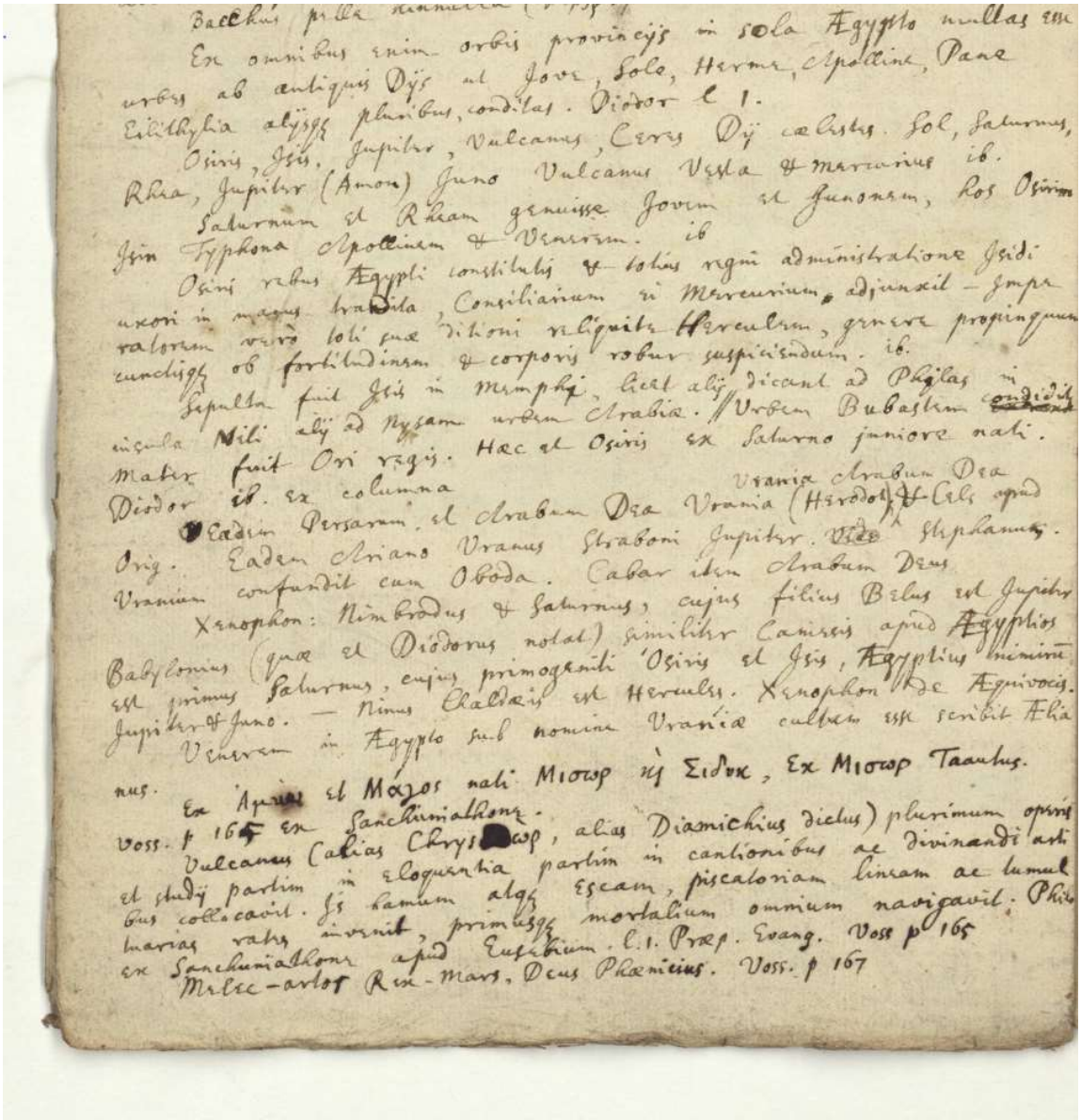


Figure 10. Following excerpts from Eusebius and Plutarch, this folio shows notes taken primarily from Diodorus, at the bottom of which Newton at a later stage added materials from Gerard Vossius' *De Theologia Gentili*, using a slightly darker ink. Yahuda Ms. 13.3, fol. 7^{v}.

on to Diodorus and Plutarch, two authors upon whom Eusebius drew heavily and whom Newton decided to study independently, before he consulted Vossius and other scholars. Although he copied primary sources from their works, at the same time he did not always take their authority for granted and often returned to the original sources themselves. For instance, having written down a reference to Origen from Gale's notes to Iamblichus, Newton added a

'Quaere?', most likely because he was by that time well acquainted with the writings of the Church Fathers and had never come across the passage in question.[237]

2.4 An independent scholar

From the above analysis of Newton's chronology-related reading and note-taking practices, it is clear that he embraced his new project with great zeal. The nature of his reading notes reveals the seriousness with which he approached the topic, drawing upon both primary sources and the works of his contemporaries. On the one hand, there were many instances where he simply copied relevant quotes from scholars such as Bochart, Marsham, and Petavius, or even just references as with Vossius, without consulting the original materials. On the other hand, the heavily dog-eared volumes of the various classical authors in his library, and the series of extensive notes taken from these and other primary sources, are testament to Newton's thorough study of ancient mythology and chronology.

It appears Newton did not take much else from the secondary sources he used. Bochart – perhaps via Stillingfleet – provided him with the identification of Saturn with Noah, and Marsham with that of Sesac with Sesostris, but from there on he took an independent route. In particular his interpretation of the Four Ages of Man as relating to four successive generations, those of Noah and his progeny, was unique to Newton, and served as a basis for his future chronological studies. Although the absence of evidence is not the evidence of absence, the fact that Newton never corresponded about these matters with the chronologists of his days suggests that he was not at all interested in scholarly discussion. This is reflected in his reading and note-taking practices**.** The absence from Newton's library of the volumes I mentioned in § 2.2.3 is an indication that he was not exactly a traditional scholar in the lines of Scaliger and Petavius. Any self-respecting classical scholar would have possessed, or at

[237] APS Ms. Temp. 3. Miss., fol. 19.

least read these volumes, if only to discuss their contents with other scholars. But Newton did not at all engage in scholarly debate with his contemporaries, at least not through writing, nor presumably in person. One searches in vain for his name amongst the inhabitants of the Republic of Letters, or mention thereof in relation to his scholarly studies. No, Newton's chronological project was a private affair. As the *Chronology of Ancient Kingdoms Amended*, the end-product of forty years of study, shows, he did not think much of the majority of classical chronologists, nor of contemporary scholars. In its more than three hundred pages only John Marsham received acknowledgement, for an inference which almost all of Newton's contemporaries considered dubious but which was of key importance for his chronological scheme. In fact, he implicitly denied the validity of contemporary scholarship when it came to the interpretation of historical data, by simply ignoring it.

This scholarly seclusion came at a price. For all his erudition and his use of the collected knowledge of his contemporaries, Newton was never trained as a classical scholar. From his Grammar School and undergraduate years he possessed a rudimentary knowledge of ancient history and mythology, but he lacked the intimate knowledge of philological methods that a Scaliger and Petavius possessed. In addition, it seems he was not always aware of the various editions of the classics that were around, and their details, which more than once led him to erroneous conclusions. It is true that his library contained several editions of Strabo's *Rerum Geographicarum*, Pindar's *Olympia, Pythia, Nemea, Isthmia*, and of Plinius the Younger's *Epistolae et Panegyricus*, as well as of the works of Plutarch. In some cases, such as the 1707 edition of Strabo, a century of diligent study had provided additional commentaries and textual improvements by scholars like Isaac Vossius, Johann Meursius, and Bochart. Yet Newton was seemingly uninterested in these commentaries: the various dog-ears in his copy all point to the main text, and primarily to the Latin translation that accompanied the Greek text, although at times he clearly consulted the latter as well.

But there were other modern editions of classical authors Newton did not have, for reasons that are not entirely clear. For example, take Thucydides' *History of the Peloponnesian War*,

which enjoyed great popularity in Newton's days. A historian and Athenian general, Thucydides provided an eye-witness account of a key conflict in Greek history between Athens and Sparta that lasted from 431 until 404 BCE.[238] Apart from the various Latin translations available, in 1629 Thomas Hobbes had published an English translation, thereby making the *History* available to a wider audience.[239] Newton never bought Hobbes' edition, nor the 1696 revised Latin edition of John Hudson, but stuck with the older Stephanus edition, originally published in 1570. Had he bought Hobbes or Hudson, he would have been spared some posthumous shaming. In a key argument in the introduction to both the *Short Chronicle* and the *Chronology of Ancient Kingdoms Amended*, he invoked the authority of Thucydides to determine the dates of Lycurgus, king of the Greek city-state Lacedaemonia, better known as Sparta.[240] According to the edition Newton used, the Lacedaemonians had had a common legislation for about three hundred years before the end of the Peloponnesian War. With Lycurgus, known as 'the Legislator' for his major overhaul of Spartan laws – and to distinguish him from an older namesake – this would place his reign at the beginning of the seventh century BCE, and not, as many ancient Greek historians followed by contemporary chronologists would have it, about a century earlier.[241] This in turn would imply that all of Lycurgus' contemporaries, that is, the various kings of the other Greek city-states, lived a century later, thereby significantly contracting Greek history, and, as a result, that of the other Mediterranean civilizations. However, as historian John Jackson was all too eager to point out in his review of Newton's calculations, Stephanus' Latin translation contained a major error: the Greek original read not *three hundred*, but *four hundred* years, thus agreeing with the

[238] F. Murari Pires, 'The Thucydidean Clio between Machiavelli and Hobbes', in C. Lee and N. Morley (eds.), *A Handbook to the Reception of Thucydides* (Chichester, 2015). 141-57. See also Thucydides, *The War of the Peloponnesians and the Athenians,* ed. and trans. J. Mynott (Cambridge, 2013); D. Shanske, *Thucydides and the Philosophical Origins of History* (Cambridge, 2007).
[239] R. Schlatter, 'Thomas Hobbes and Thucydides', *JHI*, 6 (1945), 350-62; R. Sowerby, 'Thomas Hobbes' Translation of Thucydides', *Translation and Literature*, 7 (1998), 147-69.
[240] *Chronology*, 48, 57-61.
[241] Modern historians place Lycurgus somewhere in the ninth century, see P. Cartledge, *Sparta and Lakonia: A regional history 1300-362 BC* (London and New York, 2002 [1979]), 81.

mainstream dating of Lycurgus' rule.[242] The reason Newton had not spotted this flaw was because his edition contained only the Latin text, and not the Greek, as with most other editions of Thucydides, including Hudson's, who had correctly translated the Greek τετρακόσια as four hundred – and so had Hobbes.[243]

Therefore, I suggest we should not consider Newton a chronologist, in the sense of comparing his work with that of contemporary scholars active in the field, but instead we should try to answer the question of what he thought he was doing. From the outset, he went against the grain, returning to an old-fashioned form of scholarship reminiscent of the works of Sleidan and Melanchthon and setting up the stage for a universal history that encompassed both sacred and secular history. By reducing the Four Ages of Man to single generations and incorporating all of classical mythology, he had created a framework that could encompass the histories of Egypt and Assyria without having to worry about their seemingly reliable claims to antiquity. By definition, none of these civilizations could have grown large until several centuries after the Flood, based on simple population dynamics. Yet, as I will argue throughout this thesis, constructing an all-encompassing universal history was never Newton's ultimate goal, but served a still higher purpose. This purpose cannot be found from analysing just the 'Origines', or the *Chronology*. In order to understand why Newton devoted forty years of his life to the study of ancient civilizations, in the next chapter I will reconstruct how the 'Origines' became the *Chronology*.

[242] Jackson, *Chronological Antiquities*, Vol. 3, 344-46.
[243] Th. Hobbes, *Eight bookes of the Peloponnesian Warre written by Thucydides*… (London, 1629), 11; Thucydides, *De Bello Peloponnesiaco libri octo,* ed. J. Hudson (Oxford, 1695), 15.

3. Chaos and Order

3.1 Introduction

Historians of Newton's scholarship have so far shied away from ordering the thousands of chronology-related draft folios he left. Instead, some have focussed on what they considered more or less complete treatises, without taking into account their role in the larger framework of Newton's chronological studies.[244] Others have treated the manuscripts as they are today as coherent entities, without recognizing their fragmented nature. Just a casual glance over the manuscripts reveals their chaotic and haphazard state; but even the neat and seemingly complete manuscripts have their secrets that only a careful study of their editorial history reveals.

In order to sufficiently grasp the evolution of Newton's chronological studies, it is necessary to reconstruct the order in which he composed his writings. In this chapter, I begin with the materials related to the 'Theologiae Gentilis Origines Philosophicae', which I discussed in the previous chapter. Greatly helped by the presence of the hand of Newton's amanuensis at the time, Humphrey Newton, I show how we can distinguish various stages in the development of Newton's earliest chronological treatise. I then introduce the reader to two important writings historians have separated in time and space, the 'Original of Monarchies' and the 'Original of Religions', which are in fact closely related. In order to understand the relationship between the various drafts related to these writings, I explore the ordering mechanisms Newton employed in handling sentences, paragraphs, and chapters. Armed with these insights, I discuss how both 'Originals' emerged from the 'Origines', with particular emphasis on the different versions of the 'Original of Monarchies', of which existing literature mentions only two; but there are at least five. By reconstructing how Newton transformed the 'Origines' I show

[244] Most notably Manuel in *Historian*; Westfall, 'Origines'; Knoespel, 'Interpretive Strategies'; G.W. Trompf, 'On Newtonian History', in S. Gaukroger (ed.), *The Uses of Antiquity: The Scientific Revolution and the Classical Tradition* (Dordrecht, 1991), 213-51.

how these 'Originals' were meant to be consecutive chapters of a much larger work, which eventually would become the backbone of the *Chronology*. Consequently, I propose a much later date for the 'Original of Religions' than traditionally assumed. At the same time, this reconstruction sheds new light on the connections between Newton's chronological and religious writings, which have so far not been recognised by existing scholarship.

3.2 The origins of the 'Origines'

In his earliest chronological treatise, 'Theologiae Gentilis Origines Philosophicae', Newton showed how the Euhemerized origins stories of all major Mediterranean civilizations were related and referred to Noah and his offspring. He mapped these onto the Four Ages of Man as described by Hesiod, Ovid, and Virgil, and subsequently started identifying the various mythological personae involved, with each age lasting but a single generation. This concise description is in fact only valid for the most elaborate version of the 'Origines', a version that was long in the making. Below, I will reconstruct the various stages that can be identified in the composition of the 'Origines', and what they tell about the evolution of Newton's chronological ideas. In the past, historians have been ambivalent in their demarcation of the 'Origines' from other writings, often including draft materials from elsewhere, or using 'Origines' as the title of a much larger project that included other texts.[245] Indeed, these draft materials can be considered as part of the 'Origines' in a wider context; but they do not form part of the resulting treatise, and should not be considered as such. On the other hand, the inclusion of other writings under the moniker 'Origines' is entirely unwarranted, as this chapter will show. Here, I will focus on the manuscript that bears the actual heading 'Theologiae

[245] See e.g. *Never at Rest*, 351-52 n. 55; id, 'Origines', 16. Knoespel, 'Interpretative Strategies', 180, rightly limits the *'Origines'* to Yahuda Ms. 16.2 (referring to it as Yahuda MS Var. 1, Newton MS 16, but clearly excluding Yahuda Ms. 16.1).

Gentilis Origines Philosophicae', and in particular on the neat versions in the hand of either Humphrey or Isaac Newton.

3.2.1 Reconstruction

The 'Origines' did not receive its name until after Humphrey had left Newton's service, and most likely not before the summer of 1689, when the Convention Parliament in which Newton took seat was in recess. This is evident from the treatise heading on the first page of the manuscript and the various chapter headings, which are all in Newton's hand. Of the pages in Humphrey's hand, there are several that bear a striking resemblance to one other, which appear to be different continuations from the text on other pages. It is clear that the pages in Newton's hand consist of drafts for the Humphrey materials, a continuation of these materials, or drafts for what would become the 'Original of Religions' and the 'Original of Monarchies', which I will discuss later. It is also clear that the treatise is unfinished: of the eleven projected chapters, only five, or parts thereof, appear to have been written, with no trace of the other six here or elsewhere in the corpus. The manuscript that contains the 'Origines', then, is a work in progress. In fact, it turns out there is no such treatise as 'the' 'Origines'. The manuscript contains several versions of a work to which Newton at some point added a name. In order to understand how this treatise evolved from humble beginnings to a projected eleven-chapter work, I have reconstructed these versions and, where possible, the chronological order in which they were composed; see **Figure 11**. I will first give a walkthrough of how the pages in Humphrey's hand were connected during the various stages of the 'Origines', and then discuss how Newton's ideas developed.

The oldest version of the 'Origines' in Humphrey's hand consisted of just the first six folios, **OR-B**, which form the basis of all versions, followed by folios 9-10 and 56-57, **OR-1**. At some

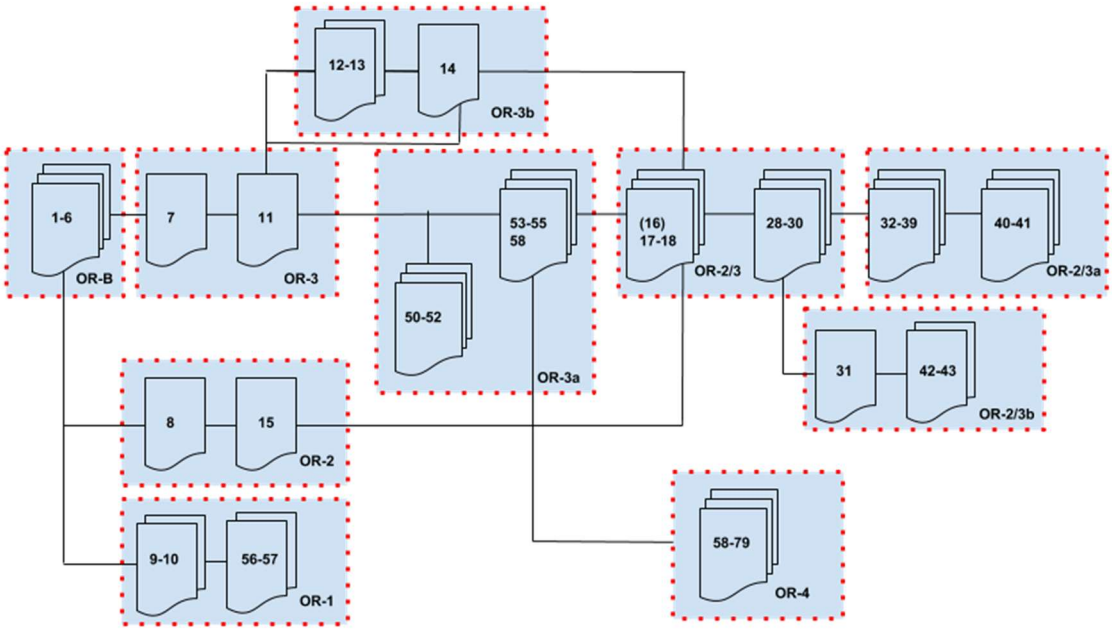


Figure 11. The structure and evolution of the *Theologiae Philosophicae 'Origines' Philosophicae*. Page numbers refer to rectos in Yahuda Ms. 16.2. See **Appendix A** for a full description and reconstruction.

point, Newton replaced **OR-1** with folios 8 and 15, **OR-2**, followed by the sections marked **OR-2/3** and **OR-2/3a**. By then, he had also begun to recast **OR-2** as **OR-3.** This, the third version of the 'Origines', shared the first six folios with its predecessors, but continued with folios 7 and 11, followed by 53-55 and 58 (**OR-3a**). In between folios 11 and 53 Newton added more materials, folios 50-52, before he discarded the entire section **OR-3a** and replaced it with **OR-3b**, at some point moving the materials from folios 12-13 to the end of **OR-2/3a**. From the unfinished lines on folio 43 it seems Newton stopped working on the project halfway through replacing **OR-2/3a** with a revised version of the text, **OR-2/3b**. Finally, after Humphrey had left, Newton returned to **OR-3a** – which he had previously discarded – and continued afresh from there, reusing many of the materials from **OR-2/3a.** For a fully worked-out description of how the various folios are related to each other I refer the reader to **Appendix A**. It must be noted that there are at least two pages in Humphrey's hand that are missing from the manuscript, nor can they be found elsewhere in the corpus. However, these pages most likely contain variant versions of the pages that are present.

The original 'Origines' then, **OR-B** / **OR-1**, composed of only ten pages, dealt chiefly with the Egyptian origins of star worship. Here, Newton discussed the sacred processions of the Egyptian priests and the composition of the Egyptian pantheon and their Greek and Latin equivalents. He also provided a brief description of the identification of Noah and his sons with Saturn and his progeny, which he took from Samuel Bochart as discussed in Chapter 2. In the second version, **OR-B** followed by **OR2** and **OR2/3**, Newton expanded on these ideas and added original research. Although he mentioned the Golden Age briefly in **OR-1**, he only fully worked out the Four Ages framework provided by Ovid, Virgil and Hesiod in **OR-2** and **OR-3**, with Humphrey once more rewriting entire pages, copying from the previous version. Initially, Newton set himself the task of describing the Egyptian theology and how both the structure of their pantheon and the contents of their religious rites demonstrated a significant understanding of the cosmos. Subsequently, he widened his scope and included the various other Mediterranean pantheons, mapping their gods onto those of Egypt and onto sacred history, to show how all classic mythologies told the same narrative of the first ages of man, namely that of Noah and his progeny.

To do this, Newton applied a similar methodology to the one he used in his studies of the prophecies, both in his interpretation of symbolism and in the application of synchronisms, where he argued that multiple visions described the same series of events.[246] For example, at one point he identified the Egyptian Typho (or Typhon) with the Greek Antaeus. Both Typho and Antaeus were described as monstrous giants, the first by Agatharchidus of Cnidos (fl. 2nd century CE), and the latter by Plutarch in his *Life of Sertorius*. Both Agatharchidus and Plutarch recalled the epic *Titanomachia*, the battle between the gods and the Titans. Since both Typho and Antaeus warred against Herculus, and since the Egyptians knew of only one war of such

[246] See S. Hutton, 'The seven trumpets and the seven vials: Apocalypticism and Christology in Newton's theological writings', in *CNI*, 165-78; R. Iliffe, ''Making a Shew': Apocalyptic Hermeneutics and the Sociology of Christian Idolatry in the Work of Isaac Newton and Henry More', in *BNS*, 55-88, esp. 73; *Priest*, 223, 245-49; see also § 4.2.2.

magnitude, they had to be one and the same.[247] In a later passage, in **OR-4**, Newton identified Typho with Noah's grandson Phut, but also with his army, since he was said to be 'a monster of many heads and many hands.'[248] Likewise, when the Titans rebelled against heaven and Typho tried to invade the kingdom of Jupiter, Newton interpreted this as Phut's attempt to conquer Egypt, '[f]or heaven is normally used by myth-writers and prophets for kingship and dominion. And the thunderbolt with which Jupiter struck down Typho is war. For fire and thunderbolt are used everywhere in the prophets for war, and the Cyclopes and their father Vulcan who forged the thunderbolts for Jupiter are the first ironsmiths who made swords and instruments of war for Jupiter Belus.'[249] Here Newton identified each of the elements in the story piecemeal – heaven, thunderbolt, Cyclopes, and Vulcan – as symbols with specific meanings: dominion, war, Jupiter, and ironsmiths, connecting the evidential dots from which a – supposedly – historical event emerged. In Chapter 4, I will return to Newton's methods of interpreting the prophecies, as they would form an integral part of his chronological studies.

In **OR-3**, Newton again expanded on the materials from **OR-2**. He now included prediluvian history, identifying the ten ancient kings of the Chaldaeans found in the writings of Berosus with the first men mentioned in Scriptures, from Adam to Noah.[250] Quoting lavishly from Eusebius, Lucian, Plutarch, and other ancient historians, Newton argued that all ancient nations had an origins story that included the Flood and a Noachian figure. This provided additional evidence to his thesis that all these civilizations began with Noah. It is here that the first references to the works of Flavius Josephus appear, in particular to his *Antiquities*, and to *Contra Apion*, from which Newton took the passage discussed in § 2.3.1 about the reliability

[247] Photius, *Bibliotheca*, 444a, citing from Agatharchidus, *On the Red* [or *Erythraean*] *Sea*; Plutarch, *Sertorius*, 9.3. See Yahuda Ms. 16.2, fols. 33^{v}-35^{r}.

[248] 'Ideoque monstrum multorum capitum & manuum esse dicitur.' Yahuda Ms. 16.2, fol. 62^{r}.

[249] Ibid., fols. 62^{r}-63^{r}. 'Nam caelum pro Throno ac dominio ~~usur~~ a mythicis \et Prophetis/ usurpari solet. Fulmen vero quo Iupiter Typhonem percussit bellum est. Nam ignis et tulmen etiam apud Prophetas pro bello passim usurpatur et <vel> Cyclopes \cum patre/ Vulcano ~~filij~~ qui pro Iove fulmina fabricarunt sunt fabri \primi/ ferrarij qui gladios et \instrumenta/ bellica pro Iove Belo ~~sub initio fabricarunt~~ \bellorum/ fecerunt. See also *Orig. of Civ.*, 129-43; M. Feingold, 'Isaac Newton, historian', in CCtN^{2}, 485-523, esp. 527.

[250] Yahuda Ms. 16.2, fols. 50^{r} ff.

of the Chaldean and Phoenician historical accounts when compared to those of the Greeks.[251] As I will show below, at a later stage of his thinking, Newton would once more shift focus and put the Egyptian rites and in particular the pagan centre of worship, the *prytaneum*, at the centre, in the 'Original of Religions'.

3.2.2 The origin of the *Chronology*

After Humphrey had left his service, Newton started reworking the 'Origines' one final time, by adding the eponymous heading and implementing a chapter structure. It is useful to reproduce his list of chapter headings in full, as it shows how he intended to transform the original 'Origines':

> Chapter 1: That Pagan Theology was Philosophical, and primarily sought an astronomical and physical understanding of the world system; and that the twelve Gods of the major Nations are the seven Planets together with the four elements and the quintessence Earth
>
> Chapter 2: That the memory of the leading Men after the Flood was venerated in the stars and in the Elements, and that the men in the first three ages, and the fourth began to flourish; [and how] the names of the celestial Gods are derived from men
>
> Chapter 3: That Noah is Saturn, and that Cham is Jupiter Hammon and that the sons of Cham with his grandsons are the other Gods and Giants who fought with the Gods in Egypt in the third age: and how Cham came down with his people into Egypt and divided the region between his sons
>
> Chapter 4: That Chus is Hercules, Mars, Moloch, and the first Belus
>
> Chapter 5: That Mizraim is Osiris and Serapis and Menaetius and Dis or Pluto, and that Mizraim had a son Orus or Apollo and a daughter Bubaste or Diana, and his illegitimate son was Thoth or the first Mercury
>
> Chapter 6: That Phut is Typho and Antaeus and Atlas and Neptune
>
> Chapter 7: That Canaan is Vulcan and Prometheus and that his wife and sister Venus was Astyr or Attyrgates
>
> Chapter 8: On the other names of the aforesaid Gods
>
> Chapter 9: How the names of the aforesaid men were given to the stars, and what the Astronomy of the ancient Egyptians was like
>
> Chapter 10: How the souls of men were translated to the stars, and the stars, thus ensouled, began to be regarded as intelligent gods, and on the origin and progress of idolatry and of the magic arts

[251] Yahuda Ms. 16.2, fols. 33^{r}, 50^{r}-51^{r}.

> Chapter 11: What the true religion of the children of Noah was like before it began to be corrupted by the worship of false Gods. And that the Christian religion became no more true nor less corrupt [252]

Together, these headings outlined a work with a scope much beyond what Newton set out to write originally. For one, as the headings for the final two chapters show, he intended the work to provide not only a full explanation of the natural philosophical origins of pagan religions, but also to uncover the oldest religion after the Flood, that of Noah, and how that religion became subsequently distorted through idolatry.[253] Moreover, he also meant to include the corruption of the Christian religion by the Catholic veneration of saints, and the dogma of the Trinity. According to Newton, the worship of Christ as *homoousios* – of the same substance – with God the Father was the most grievous form of idolatry the Church had succumbed to. It was a topic to which he had devoted ample study during the 1670s, in particular the history of the fourth century councils in which the dogma of the Trinity had been discussed and accepted.[254]

Much of what Newton wrote in the earlier versions of the 'Origines' was incorporated in its final instalment. At one stage in his writing process, presumably when working on chapters four and five, he must have paused, sat down, and worked out the remaining chapter structure, as

---

[252] 'Cap. 1 Quod Theologia Gentilis Philosophica erat,et ad scientiam Astronomicam & Physicam systematis mundani apprime spectabat: quodque Dij duodecim majorum Gentium sunt Planetae septem cum quatuor elementis et quintessentia Terra' (fol. 1^{r}); 'Cap. 2. Quod Hominum post Diluvium primorum memoria in astris et Elementis colebatur, quodque homines illa aetatibus tribus primis et quarta jam verò Deorum caelestium nomina ab hominibus desumpta sunt.' (fol. 7^{v}); 'Cap. 3 Quod Noachus sit Saturnus, quodque Chamus sit Iupiter Hammon et quod Chami filij cum nepotibus sint et Dij reliqui et Gigantes qui cum Dijs aetate tertia in Ægypto dimicarunt: et quomodo Chamus cum suis in Ægyptum descendit et regionem inter filios divisit.' (fol. 53^{v}); 'Cap. 4 Quod Chus sit Hercules, Mars, Moloc, et Belus primus.' (fol. 65^{r}); 'Cap. 5 Quod Mizraim sit Osiris et Serapis et Menaetius & Dis vel Pluto quodque Mizraimo nati sint filius Orus seu apollo et filia Bubaste seu Diana et filius nothus Thoth seu Mercurius primus.' (fol. 73^{r}; there are two other versions of this chapter heading, on fols. 67^{v} and 68^{v}; the version on 73^{r} is the last); 'Cap. 6 Quod Phut sit Typho et Antaeus et Atlas et Neptunus. quod Canaan sit Vulcanus et Prometheus et quod ejus uxor et soror Venus fuit Astyr seu Attyrgates; Cap. 8 De alijs Deorum praedictorum nominibus; Cap 9 Quomodo nomina praedictorum hominum sideribus imposita sint & qualis fuit Astronomia veterum Ægyptiorum; Cap. 10 Quomodo animae hominum in stellas translatae sunt & stellae sic animatae pro dijs intelligentibus haberi cœperunt, deque origine et progressu idololatriae et artium magicorum; Cap. 11. Qualis fuit vera Noachidarum religio antequam per cultum falsorum Deorum corrumpi caepit. Et quod religio Christiana non magis vera nec minus corrupta evasit' (all fol. 43a^{v}); all Yahuda Ms. 16.2, normalized.
[253] M. Goldish, *Judaism in the theology of Sir Isaac Newton* (Dordrecht, 1998), 40-55.
[254] *Priest*, 133-56, 171-76.

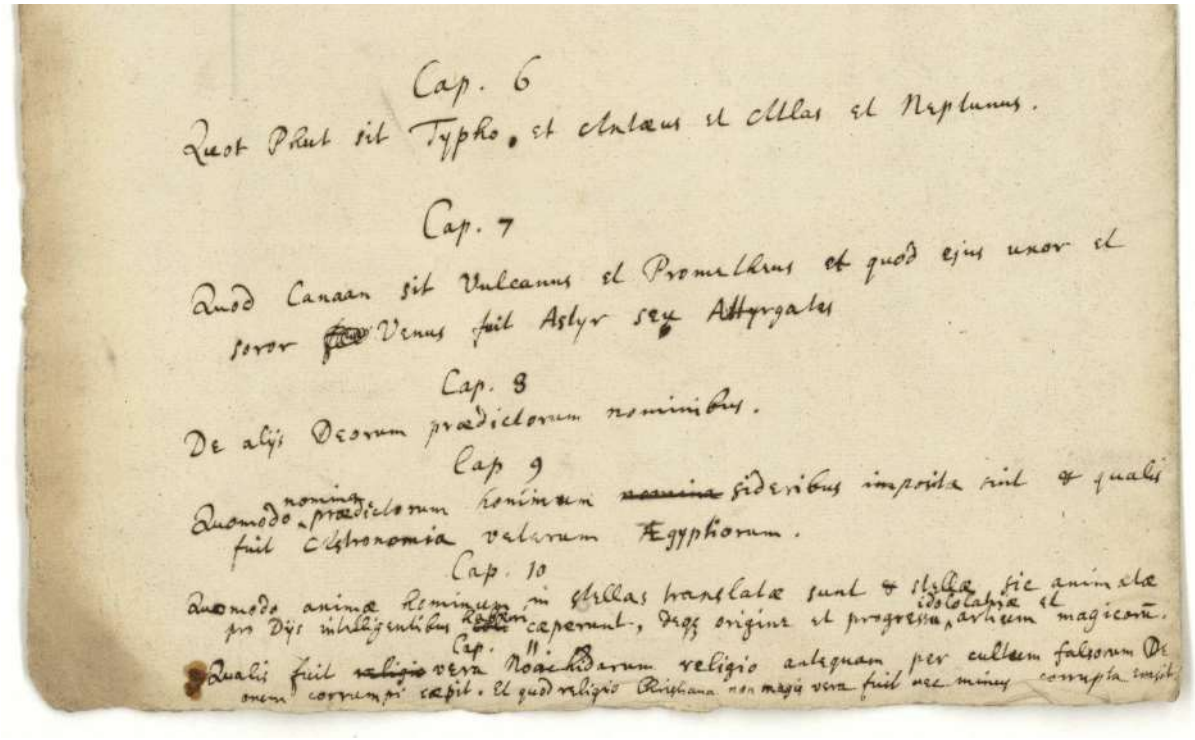

Cap. 6
Quot Phut sit Typho, et Atlaus et Ollus et Neptunus.
Cap. 7
Quod Canaan sit Vulcanus et Prometheus et quod ejus uxor et soror Venus fuit Astyr seu Astygatis
Cap. 8
De aliis Deorum prædictorum nominibus.
Cap 9
Quomodo nomina prædictorum hominum ~~nomina~~ sideribus imposita sint et quales fuit Astronomia veterum Egyptiorum.
Cap. 10
Quomodo animæ hominum in stellas translatæ sunt et stellæ sic animatæ pro Dijs inteligentibus coli cæperunt, deqz origine et progressu idolatriæ et magicæ.
Cap. 11
Quali fuit ~~religio~~ vera Noachidarum religio antequam per cultum falsorum Deorum corrumpi cæpit. Et quod religio Christiana non magis vera fuit nec minus corrupta mansit.

Figure 12. Newton's projected chapter headings for the second half of the *'Origines'*. Yahuda Ms. 16.2, fol. 43a^{v}.

can be deduced from **Figure 12**. The headings for the projected chapters six to nine suggest they would include material that had already appeared in the earlier renditions of the 'Origines'. What originally were mere paragraphs would now be turned into full-fledged chapters, sometimes dealing with the identification of a single, key figure, such as Ham's son Phut with Typho, or Canaan, another of Ham's sons, with the Roman Vulcan and the Greek Prometheus. For all his plans, however, he soon gave up on this particular outline, as there are no matching chapters six and following among his writings. Interspersed among the folios in Humphrey's hand, however, there are draft sections and set-ups for some of these chapters. Here Newton set out to prove that Atlas was Phut, an identification belonging to chapter six, or to establish 'the original names of Venus', materials he intended for chapter seven.[255] Although Newton abandoned the 'Origines', the core argument of the treatise was never far away, with many of its ideas and passages returning in subsequent writings all the way to the *Chronology*.

The 'Origines' then was not written overnight, but instead shows a complex editorial and

[255] Yahuda Ms. 16.2, fol. 15^{v}.

intellectual history. Throughout the 1680s and early 1690s Newton added and removed, expanded, and changed focus. The original 'Origines', **OR-B/1**, was a short and simple tract about the origins of star worshipping. The final version, **OR-B/3/3a/4**, even in its unfinished state with just the first five chapters, was a dense chronological work dealing with the earliest postdiluvial generations in their various guises. Here is also the first time the *prytaneum* occurs in Newton's writings, which would play an important role in the later 'Original of Religions'.[256] When comparing the various stages of the 'Origines' for the sources Newton used, it is clear that in between writing **OR-1** and **OR-4** he did a great deal of studying. Originally drawing primarily on references provided by Eusebius' *Praeparatio Evangelica* and by Bochart and Vossius, for **OR-2** Newton now also included materials found elsewhere. Somewhere in between these two versions he consulted Marsham's *Canon Chronicus*. Although he did not mention the volume, he copied several references such as those to the 1652 edition of Syncellus' *Chronographia*.[257]

In **OR-4**, Newton included another contemporary author. Early on, while writing **OR-1**, Newton had understood from Plato that Egypt was once called Chamia or Chemia, after Ham (also spelt 'Cham') and thus 'the land of Cham' mentioned in Scripture referred to Egypt.[258] But when he had copied out the passage for **OR-4**, adding references to Plutarch and Scripture taken from Bochart's *Geographia Sacra*, he decided to include evidence from Athanasius Kircher's *Prodromus coptus sive Ægypticus* (1636), a Coptic grammar.[259] In this case, Newton's original source was probably again Bochart, as he elsewhere acknowledged, but further down the manuscript he incorporated more references to Kircher's *Prodromus* and to his influential *Oedipus Ægyptiacus* (1652–54) which suggest Newton might have looked up

[256] Yahuda Ms. 16.2, fols. 12^{r} and 13^{v}. See Iliffe, 'Meaning of the *Principia*', 165-67. Cf. Knoespel, 'Interpretative strategies', 193, who asserts that the *prytaneum* does not appear in the *'Origines'*.
[257] Yahuda Ms. 16.2, fol. 16^{r}.
[258] Yahuda Ms. 16.2, fol. 17^{r}; see also fol. 10^{v}, a draft for fol. 18^{r}, and thus belonging to **OR2/3**, and fol. 25^{r}. Elsewhere, Newton added 'Plato in Phaedra'; Yahuda Ms. 41, fol. 10^{r}.
[259] Yahuda Ms. 16.2, fol. 55^{v}, an addition to fol. 58^{r}.

Kircher's writings in one of the libraries at his disposal.[260]

In **OR-3a**, Newton invoked a new ancient authority, Sanchuniathon, which he found in Eusebius' *Praeparatio Evangelica*. Sanchuniathon's *Phoenician Histories* had received great attention from scholars like Scaliger, Grotius, Bochart, and Selden, for its author had purportedly lived close to the times of Moses.[261] Moreover, his chronology was in agreement with that presented in Scripture, thus lending mutual support to both. But by the late seventeenth century, Sanchuniathon had become highly suspect, because of his unclear credentials, and because his chronology of ancient Assyria diverged significantly from that of other authors, most notably Herodotus.[262] Apparently, Newton was not convinced by the objections of his contemporaries, if indeed he knew about these. Sanchuniathon remained an important author for his writings until about the second decade of the eighteenth century, as I will show below. In the *Short Chronicle*, penned in 1717, Newton still included him in his list of important people and events, but suggested he flourished in around 760 BCE. By then, Newton had calculated that the Assyrian Empire had been much younger. Originally, in the 'Origines' and in the writings that followed, he had ascribed its foundation to the legendary Ninus, whom he considered to be one and the same with the Biblical Nimrod who lived just after the Flood.[263] But in the *Chronology*, Newton no longer believed that Ninus was a real person. Most likely, it was still Nimrod who had founded the Assyrian city Ninus, but it remained a small kingdom until the days of Pul, known to us as Tiglath-Pileser III, as I will discuss in Chapter 4.[264] As his purchase and reading of Cumberland's translation of the *Phoenician*

[260] Yahuda Mss. 16.2, fol. 66^{r}, and 17.2, fol. 28^{r}; see also Yahuda Ms. 41, fol. 15^{r}. For Kircher, see also D. Stolzenberg, *Egyptian Oedipus*: *Athanasius Kircher and the secrets of antiquity* (Chicago, 2013), and the various contributions in Findlen, *Athanasius Kircher*.

[261] Eusebius, quoting from Porphyry, wrote that Sanchuniathon had dedicated his *Histories* to Abibalus, King of Berytus (modern day Beirut), who lived around 1200 BCE; Eusebius, *Praeparatio*, 1.9.

[262] See H. Dodwell, *A discourse concerning Sanchoniathon's Phoenician history* (London, 1681); R. Cumberland, *Sanchoniatho's Phoenican history - from the first book of Eusebius De praeparatione Evangelica…* (London, 1720). See also *Orig. of Civ.*, 199-200.

[263] See e.g. Yahuda Ms. 16.2, fol. 70^{r}.

[264] *Chronology*, 75 ff.

Histories (1720) shows, Newton remained interested in Sanchuniathon, but would no longer rely on his authority.[265]

3.3 'Originals'

At the 1936 Sotheby auction, John Maynard Keynes, the economist, and Abraham Yahuda, the American-born Jewish scholar, had managed to lay their hands on a substantial number of Newton's non-scientific manuscripts. Keynes was mainly interested in the alchemical papers and Yahuda in the religious materials, but both ended up buying a number of chronological manuscripts as well. After his death, Keynes' archive ended up in King's College, Cambridge, and it was here that the intellectual historian, Frank Manuel, first encountered Newton's studies of ancient civilizations. He was particular enamoured by a twenty-six folio fragment, headed 'Chap. 1. The Original of Monarchies,' which seemed a more or less complete treatise that he dated as belonging to the early 1690s.[266] Initially, Manuel meant to publish just an annotated edition of the fragment, but upon comparing it with the manuscripts found in New College, Oxford, which contained another version of the 'Original of Monarchies', he changed his mind. Instead, he decided to include a discussion of the contents and reception history of the *Chronology of Ancient Kingdoms Amended*, which, set against the intellectual background of late seventeenth and early eighteenth century chronology and mythography, became his book *Isaac Newton, Historian* (1963). How closely Manuel inspected the New College papers is not entirely clear. For one, he claimed that both versions of the 'Original of Monarchies' were much alike, listing as evidence various chapter headings found among the New College version.[267] As I will show below, there are in fact

[265] *Library*, 127. Newton's copy contains seven dog-eared passages, all to Cumberland's commentary.
[266] *Historian*, 198; the manuscript is Keynes Ms. 146.
[267] *Historian*, 15. See also R. Delgado-Moreira, 'Epistemological and rhetorical strategies in Newton's theological writings' (Imperial College London, diss., 2006), 222.

significant differences between both manuscripts. For now, let us briefly inspect the version of the 'Original of Monarchies' that Manuel published.

3.3.1 'The Original of Monarchies'

The Keynes version of the 'Original of Monarchies' begins with the division of the world amongst Noah's sons, a theme familiar from the 'Origines'. Taking the Old Testament as his guide, Newton subsequently discussed how the early Israelites settled in Canaan, the foundation of the Assyrian monarchy under the legendary Nimrod, the Greek kingdoms of Athens and the Argives, the Phoenicians, Italy, and Egypt, paying attention to how these monarchies arose and their antiquity. Apart from Scripture, Newton's main sources of information were Strabo, Pausanias, Thucydides, Herodotus, Pliny, Plutarch, and Homer – all authors he had read and from whom he had taken notes while still at Cambridge. Other authors that played a dominant role in the 'Origines', such as Eusebius and Diodorus, are referred to with much less frequency. Initially, this seems obvious, as his focus had shifted: instead of comparing pantheons to demonstrate the shared mythologised history of the major Mediterranean civilisations, he now discussed how these civilisations themselves emerged. However, in later reworkings of the 'Original of Monarchies', he once more included ample references to the works of Diodorus. He also included passages about the deification of ancient kings and heroes, one of the main concepts of the 'Origines', but not found in the Keynes 'Original'; however, as I will show in Chapter 4, the theme would reappear in the *Chronology*.[268]

Just as with the 'Origines', in the Keynes 'Original of Monarchies' Newton hardly cited any contemporary authors. The single exception was Samuel Bochart, who 'hath shewn that y^{e} sons of Chus were planted in several regions round about y^{e} Persian gulf'.[269] It was Newton's follow up to a note-to-self from the 'Origines': 'Consult Bochart on the seats of all these people',

[268] *Chronology*, 159-65.
[269] Keynes Ms. 146, fol. 2^{r}.

which Newton duly did, copying the passage from the *Geographia Sacra*.[270] By contrast, he included many references to secondary sources in folios traditionally associated with a second version of the 'Original of Monarchies' found among the *New College* papers. Here Bochart and Marsham featured prominently, as well as works Newton newly consulted, such as Johann Michael Vansleb's *The present state of Egypt*.[271] Unsurprisingly, some of these references, or rather Newton's sources for these, were again rather veiled. In a passage on the colonisation of the Lower Egypt, he wrote that 'Eusebius tells us that these Canaanites flying from the sons of Israel built Tripolos in Afric. And the Jerusalem Gemara that the Gergesites fled from Joshua going into Afric.' Whether Newton ever consulted the *Gemara*, a part of the *Talmud* which contains rabbinical commentaries on the *Mishnah* – a third century treatise on the Jewish oral tradition – is unclear, but the reference he provides, 'Ad Tit. Shebijth, cap. 6.' betrays his source, John Selden's *De Jure Naturali et Gentium*.[272]

It is easy to see why the Keynes manuscript appealed so much to Manuel. It consists of twenty-six folios, written in a neat hand, with hardly any alterations, and forms a coherent narrative. As I will show later in this chapter, looks can be deceiving. Newton continually rewrote and reordered his materials, and the Keynes 'Original of Monarchies' formed but one stage of the forty-year long trajectory that eventually culminated in the *Chronology of Ancient Kingdoms Amended*. In order to understand how Newton transformed the modest 'Origines' into the *Chronology*, and what this transformation consisted of, it is necessary to map not one, but *all* the in-between stages. This includes the various 'Originals' *of Monarchies*, of which we can distinguish at least five different versions. But first, let us have a closer look at another

[270] 'De quorum omnium sedibus Bochartum in Phaleg & Paradiso consulas.' Yahuda Ms. 16.2, fol. 69^{v}, normalised.
[271] 'Macrisi an Arabian historian, cited by Vanslebius in his voyage into Ægypt…' NCL Ms. 361.1, fol. 127^{v}; J.M. Vansleb, *The present state of Egypt; or, A new relation of a late voyage into that Kingdom...1672 and 1673... Englished by M.D*. (London, 1678), 3 and *passim*. Newton owned a copy of the work, see *Library*, 225.
[272] NCL Ms. 361.1, fol. 116^{r}. The reference is in J. Selden, *De Jure Naturali et Gentium*…, Lib. VI, Cap. XIII, 'Unde Gergesai … aufugerunt in Africam...' ['Hence the Gergesites… fled to Africa…'], which is 772 of the 1665 Strasbourg edition Newton owned.

important fragment, the 'Original of Religions', which would play a dominant role in the development of Newton's chronological ideas.

3.3.2 Religion between the lines

The 'Original of Religions' concerns an incomplete draft, traditionally understood by historians of Newton's scholarship as closely related to the 'Origines' in terms of topic and date of composition.[273] With most of the latter work written before 1689, the common date assigned to the 'Original of Religions' is 1691–93.[274] Indeed, there are connections between the two writings, with themes, quotations, and passages from the 'Origines' returning in the 'Original of Religions', which shows that it was composed sometime later. However, the most direct relationship between the two manuscripts is a physical one. Among the pages of the manuscript that contains the 'Origines', there are a number of folios that distinguish themselves primarily through their lay-out, in particular a series of paragraph headings, see **Figure 13**. These are, consecutively:

> 14 ~~12~~ Quod Canaan sit etiam Busiris \& Canobus & Proteus/. Et quomodo Canaan divisit regnum suum inter filios
>
> 16 De Veneris nominibus
>
> 17 ~~Quod Venus et Adonis sunt Semiramis et Ninus~~ \That Venus & Adonis were Semiramis & Ninus & of the various names of Venus/

[273] See Westfall, 'Origines', 16-17; *Orig. of Civ.*, 146, 151; Westfall, in 'Theological Manuscripts', 136, explicitly grouped together the *'Origines'* and both 'Originals' as part of a 'new theological work that Newton undertook in the mid 80's… the most important theological treatise that Newton ever wrote.' Knoespel does not mention a date for the 'Original' *of Religions* but notes how Westfall in his discussion of the *'Origines'* 'confuse[s] related projects' and 'makes little distinction' between both works; 'Interpretive Strategies', 192-97, esp. 193 n.17.

[274] Buchwald and Feingold date the 'Original' *of Religions* as ca. 1691, see *Orig. of Civ.*, 146, 151; Westfall, in *Never at Rest*, 352, considered the 'Original' *of Religions* 'a more finished form' of the *'Origines'*. In the paper he devoted specifically to the *'Origines'*, Westfall dated the 'basic manuscript', Yahuda Ms. 16.2, as 'soon after late 1683,' based on the presence of Humphrey's hand, and the 'Original' *of Religions*, as around December 1692; id., 'Origines', 16-17 and 31. Iliffe dates an earlier Latin version of the 'Original' *of Religions* as mid-1680s, referring to Yahuda Ms. 17.3, fols. 14^{r}-15^{r}; see id., 'Newton's Anti-Catholicism', 104-5. It should be remembered that Manuel, in *Historian*, does not discuss the Yahuda manuscripts, including the *'Origines'* and the 'Original' *of Religions*, because at the time of writing he did not have access to these; see also Iliffe, 'Connected System', 149.

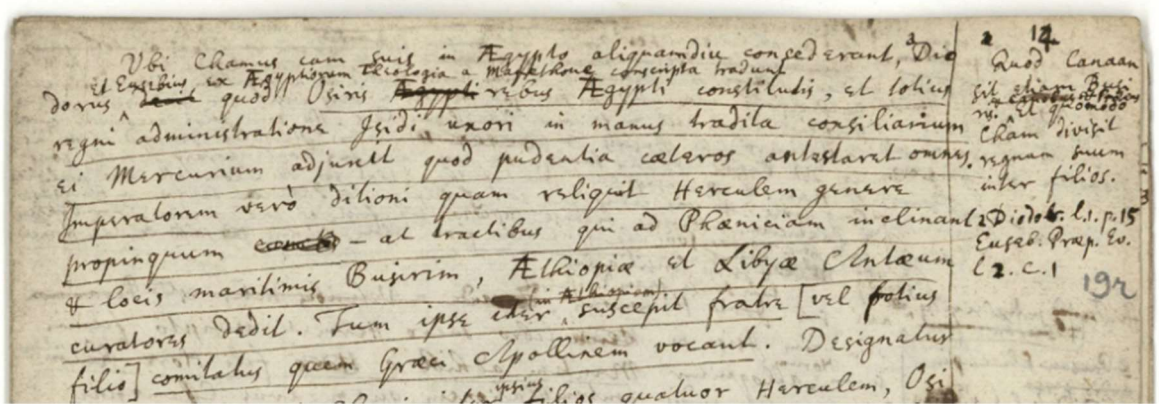


Figure 13. Marginal paragraph headings among the *'Origines'* papers, Yahuda Ms. 16.2, fol. 19[r].

> 18 ~~17~~ ~~15~~ De Dijs reliquis Ægyptijs Mercurio, Minerva, Latona, Apolline ac Diana[275]

Although the topics listed here return in the text of the 'Origines', the manuscript contains no other such paragraph headings. However, similar headings appear in a chapter connected with the 'Original of Religions', as I will show below.

Unlike 'Theologiae Gentilis Origines Philosophicae', 'The Original of Religions' is not in fact the title of a treatise, but the second chapter of a larger work. Indeed, halfway down one side of the manuscript there is another heading, 'Chap. 3. The history of the first ages & of the kingdom of Egypt'.[276] Newton subsequently deleted this heading and much of the surrounding text, wrote a new version of the deleted paragraphs, and continued with a shortened title, 'Chap. III. The history of the first Ages', contemplating a separate chapter for the history of Egypt.[277] There is also a deleted Latin version of the first paragraph of the manuscript, headed 'Cap. II De Origine Religionum', which clearly predates the English text. Whether the Latin version ever went beyond a single paragraph is unclear, as the text ends here and there are no variant versions elsewhere in the corpus, apart from the drafts in the 'Origines' manuscript. It appears that Newton soon switched languages and continued in English. The exact reason

[275]Yahuda Ms. 16.2, fols. 19[r] ['14 That Canaan is also Busiris \& Canobus & Proteus/. And how Cham divided his kingdom among his children], 20[r] ['16 About the name of Venus.'], 21[r], and 25[r] ['The other Egyptian gods Mercurius, Minerva, Latona, Apollo and Diana']. The 'Original' *of Religions* materials include fols. 19[r]-25[v].

[276] Yahuda Ms. 41, fol. 11[r].

[277] Yahuda Ms. 41, fols. 9[v], 10[v], and 26[r].

for this change is unclear, but it is reminiscent of the language switch between the 'Origines' and the 'Original of Monarchies'. Of course, when it came to his intellectual practice, Newton was entirely bilingual. In fact, in what must have been a slip of concentration, about a quarter way in the chapter on Egypt, following a Latin quote he did not return to English but continued the main text in Latin. He only returned to English following the next Latin quote, to eventually finish the chapter in Latin, after a few more linguistic lapses.[278]

In the 'Original of Religions' and the subsequent chapter on Egypt, Newton focused on the origins of a religion centred on the *prytaneum*. He described how this religion, which he traced back to Noah's antediluvian sacrificial practices, was not a local Mediterranean phenomenon, but spread out all over Europe and Asia, as far as India and China. Here Newton drew upon more than ancient sources: he included Medieval and contemporary travel literature, such as the writings of the Flemish Franciscan Willem van Ruysbroeck and Giovanni da Pian del Carpine.[279] In fact, he argued, Stonehenge too was once a *prytaneum*, and so was the sacred fire that burned in the monastery of St Brigid in Kildare in Ireland, possible until the sixteenth century when the monasteries were dissolved.[280] What is significant here is that those who performed the sacrifices in the *prytanea* were not priests, but representatives of the city council. As Newton wrote in the Keynes 'Original of Monarchies': 'So then the government of every city was at first complete & absolute in matters both civil & sacred. Every City had its Prytaneum or Vestal temple with a Court in it for the council \of the City/ to sacrifice and consult about civil affairs.' In the 'Original of Religions', he emphasized the religious aspects of these structures, and their universal occurrence, thus providing evidence for the global spread of the

[278] Yahuda Ms. 41, fols. 15^{r}-16^{r}; fols. 25^{r-v} are in English, but seem to be a later addition. There is an earlier lapse on fol. 13^{r}, where Newton seems to have copied out a passage from Yahuda Ms. 16.2, fol. 58^{r}, the last draft for the *'Origines'*. From the manuscripts it is clear that the Latin passages do not constitute part of the earlier Latin version, as the changes of language occur in the middles of paragraphs.

[279] Yahuda Ms. 41, fol. 3^{r}; I have been unable to identify Newton's source for these references. In both cases the reference is just a 'cap. 3', which makes it unlikely he actually read the original materials; they do not appear in his library as individual volumes.

[280] Yahuda Ms. 41, fols. 3^{r-v}. See also J.E. Force, 'Newton, the 'Ancients' and the 'Moderns'', in *CNI*, 237-57, esp. 253-56; *Priest*, 210-12.

Noachian worship and its decay into idolatry. 'The worshipping therefore of these fals Gods & Goddesses in y^e^ Prytanea was y^e^ first & most generall corruption of y^e^ primitive religion: but y^e^ grossest corruption was by introducing y^e^ worship of dead men & statues.' The *prytaneum* then was both the centre of worship and the centre of governance.[281]

At the same time, as Newton tried to prove from Plutarch, Pliny, Macrobius, and Dionysius Halicarnassus, the *prytaneum* was also a blueprint of the cosmos, thus testifying to the ancients' knowledge of heliocentrism and even the inverse square law of gravity. In an unpublished preface to the *Principia*, he wrote that '[t]he Chaldeans long ago believed that the planets revolved around the sun and that the comets do so in extremely eccentric orbits… it was also known to the ancients that the moon is heavy toward the earth, and that the stars are heavy toward one another, and that all bodies in a vacuum fall to the earth with equal velocity and thus are heavy in proportion to the quantity of matter in each of them… I did not invent it but have only tried to use the force of demonstrations to revive it.'[282] There are related materials, most notably the so-called 'Classical Scholia', which he showed to a select group of intimates, including Gregory, in the early 1690s.[283] These scholia were drafts for the second edition of the *Principia* and included ample references to ancient writers such as Pythagoras, Epicurus, and Lucretius, demonstrating a firm belief in a form of *prisca mathematica*. As such,

[281] Keynes Ms. 146, fol. 8^r^; Yahuda Ms. 41, fol. 9^r^.

[282] Yahuda Ms. 41, fols. 6^r^-7^r^; CUL Ms. Add. 3968, fol. 109^v^, trans. Cohen and Whitman, *Principia*, 53. See also Newton to Halley, 20 June 1686, in *Correspondence*, Vol. 2, 437; CUL Ms. Add. 3990, fol. 1^r^.

[283] J.E. McGuire and P.M. Rattansi, 'Newton and the 'Pipes of Pan'', *NRRS*, 21 (1966), pp, 108-43; Casini**,** *Classical Scholia*; P.M. Rattansi, 'Newton and the wisdom of the ancients', in J. Fauvel et al. (eds.), *Let Newton be! A new perspective on his life and works* (Oxford, 1988), 185-201; V. Schüller, 'Newton's scholia from David Gregory's Estate on the Propositions IV trough IX Book III of his Principia', in W. Lefèvre (ed.), *Between Leibniz, Newton, and Kant: Philosophy and Science in the Eighteenth Century* (Dordrecht, 2001), 213-66; R. Iliffe, 'Butter for Parsnips: Authorship, Audience, and the Incomprehensibility of the *Principia*', in M. Biagoli and P. Gallison (eds.), *Scientific Authorship: Credit and Intellectual Property in Science* (Abingdon, 2003), 33-66, esp. 56-57; D.B. Haycock, "The long-lost truth': Sir Isaac Newton and the Newtonian pursuit of ancient knowledge', *Studies in History and Philosophy of Science* 35 (2004), 605-23; S.D. Snobelen, 'The true frame of Nature': Isaac Newton, Heresy, and the Reformation of Natural Philosophy', in J.H. Brooke and I. Maclean (eds.), *Heterodoxy in Early Modern Science and Religion* (Oxford, 2005), 223-62, esp. 234-47. See also Iliffe, 'Connected System', 154-56; Guicciardini, *Reading the* Principia, 101-04; S.D. Snobelen, 'The Theology of Isaac Newton's Principia Mathematica: A Preliminary Survey', *Neue Zeitschrift für Systematische Theologie und Religionsphilosophie*, 52 (2010), 377-412, esp. 395-97.

he, Newton, was only discovering what had been known in ancient times but had been forgotten. From David Gregory's notes dated 5–7 May 1694, it seems likely that the materials found in these scholia, which never made it to the second or third edition of the *Principia*, included at one time the 'Origines': 'He has composed a tract on the origin of nations. Religion is the same at all times, but the religion which they received pure from Noah and the first men, the nations debased by their own inventions…'[284] What is intriguing, is that Gregory ended his summary of the materials he had seen with the words 'Christ reformed the religion of Moses.'[285] None of the materials in the 'Origines' agree with this description, nor those found in any of Newton's other writings. However, as I mentioned above, several pages from the 'Origines' in Humphrey's hand have gone missing, most likely because they were not recognised as Newton's, and something similar might have happened to the materials Gregory described.

With regards to the *prytaneum*, Newton wrote, '...twas one designe of y^{e} first institution of y^{e} true religion to propose to mankind by y^{e} frame of y^{e} ancient Temples, the study of the frame of the world as the true Temple of y^{e} great God they worshipped. And thence it was y^{t} y^{e} Priests anciently were above other men well skilled in y^{e} knowledge of y^{e} true frame of Nature & accounted it a great part of their Theology.'[286] In a suppressed 'liber secundus' of the *Principia*, posthumously translated and published in 1729 as 'Newton's System of the World', he wrote about 'that wise king of the Romans, Numa Pompilius, who, as a symbol of the figure of the world with the sun in the centre, erected a round temple in honour of Vesta, and ordained perpetual fire to be kept in the middle of it.'[287] In the manuscript that contains the 'Original of Religions', he subsequently reused much of the chronological scheme he had developed for

[284] 'Tractatum Conscripsit de Originatione Gentium. Religio Omni tempore eadem, sed quam a Noha primisque hominibus puram acceperunt, Ethnici inventis propriis deturparunt…', *Correspondence*, Vol. 3, 336-38 (translation amended).
[285] 'Christus Mosis Religionem reformavit', ibid.
[286] Yahuda Ms. 41, fol. 7^{r}, normalised.
[287] I. Newton, *Sir Isaac Newton's Mathematical Principles of Natural Philosophy and his System of the World Translated... by Andrew Motte in 1729. The translation revised... by Florian Cajori* (2 vols., Berkeley and Los Angeles, 1962 [1934]), Vol. 2, 549. See also Iliffe, 'Meaning of the *Principia*', 163-70, and *Priest*, 200-18.

the 'Origines', including the introduction of star worship, the primacy of the twelve major gods, and the Four Ages of Man. In particular the third chapter, 'The history of the first ages and of the kingdom of Egypt', was more or less grafted onto his earlier tract. It is here that a full series of paragraph headings appears, which together provide a clear and concise overview of the chapter:

> 1 The history of the first ages couched in that of y^{e} 12 Gods
>
> 2 The 12 Gods the ancestors of y^{e} Egyptians first worshipped in Egypt
>
> 4 ~~3~~ The 12 Gods ~~Noah & sons~~ lived in the times next after the flood,
>
> represented by the 4 ages of gold silver brass & iron
>
> 5 ~~4~~ Saturn & ♃ Jupiter who reined in the golden & Silver ages are Noah & Cham & that y^{e} wars in the brazen age were between y^{e} sons of Ham
>
> 6 ~~5~~ The difference between y^{e} theology of y^{e} Egyptians Chaldeans & Assyrians
>
> 7 ~~6~~ That Chus is Hercules
>
> 8 ~~7~~ That Hercules, Mars, Belus, Moloch, Bacchus, Pan are but several names of one & y^{e} same God Chus
>
> 9 ~~8~~ That Misraim is Osyris. ~~& Pl both are Pluto~~
>
> 10 ~~9~~ Osiris, Apis \Epaphus/, Serapis, Pluto, Menes, Menaetius \Hyperion/ the same man
>
> 11 ~~10~~ That Phut is Typhon, Python, ~~Ancas, Atlas, Neptunus~~; \Typhoeus/ Briareus, Enceladus, Neptunus, & y^{t} ~~Orus~~ Pathros is Orus
>
> 12 ~~11~~ Quod Phut sit etiam Antaeus et Atlas \et Astraeus et Athamas/
>
> 13 ~~11~~ Quod Canaan sit Vulcanus
>
> 16 ~~14~~ Quod ~~Canaan~~ \Prometheus/ et Epimetheus ~~sit etiam Busiris et Prometheus et Baetylus~~ \sint Chanaan et Chus/
>
> 15 ~~13~~ Quod \Ilus/ Dagon et Betylus sint \Chus/ Misraim et Chanaan: ~~quodque Eloim sint filij Chus et Titaea uxor Cham … ejusque filij Titanes~~ quodque hi & Phut sint Titanes ex matre Titaea et quod Elohim ~~sunt sint fi~~ Dioscum et Dij Cabiri sint filij Chus[288]

As is clear from the paragraph contents, which partially mirror, and partially expand the materials covered in the 'Origines', and from their numbers, Newton restructured the materials

[288] Yahuda Ms. 41, fols. 11^{r} (twice), 12^{r}, 12^{r}-13^{r}, 13^{r}, 14^{r-v} (two separate but identical drafts), 15^{r}, 16^{r}, 17^{r}, 19^{r}. 20^{r}, 21^{r}, 23^{r}, 24^{r}; ♃ is the astronomical and alchemical symbol for Jupiter. See also NCL Ms. 361.3, fol. 236^{v}: 'Let all this be inserted between sect 5 & sect. 6. with this title... The wars in the brazen age were waged wth clubs between the sons of Cham & in y^{e} end of that age they found out iron weapons.'

several times. Some paragraphs appear to be missing; others have been taken from previous drafts. It also turns out that the pages in between those of the 'Origines' contain older versions for what was once a paragraph 12, then 14, then 16, and three sections that continued the materials from the 'Original of Religions'. Clearly, Newton was working on the 'Original' with the 'Origines' close at hand.

What exactly is the relationship between these two works? It is clear that the 'Original of Religions' was written after the 'Origines', as can be deduced from a few lines on the back of one of the inserted 'Original' folios which refer to the Million Act and mention Sir Robert Howard, the Auditor of Exchequer.[289] The Million Act, meant to raise a million pounds to cover the cost of war with France, passed in January 1692/93.[290] Alas, in May 1693, the funds raised fell well short of their target, with little over £375.000 subscribed. This provided the opportunity for those involved to exchange their shares for a 14% life annuity.[291] It seems unlikely that Newton would have had any interest in these matters before he became Warden of the Mint in March 1696.[292] Since Robert Howard died 3 September 1698, this provides some fairly precise *termini* for the Latin 'Original of Religions', as the text on the recto belongs to the earlier version. Of course, it is possible that the lines referring to the Million Act were added afterwards; but there are good reasons why the reverse order is more plausible. The sheet is clearly torn from a full folio, supposedly to add to or replace a paragraph from the main Latin text. It seems highly unlikely that Newton would at a later moment reuse the sheet for Mint-related matters and then reinsert it in the manuscript. Obviously, it does not mean that the entire treatise was written between these two dates, but it is clear that Newton was working on it around 1696–98. From the various related Latin and English fragments, it is also clear

[289] Yahuda Ms. 16.2, fol. 20^{v}.
[290] See R.D. Richards, *The Early History of Banking in England* (New York, 2012 [1929]), 143-44; M.A. Milevski, *King William's Tontine: Why the retirement annuity of the future should resemble its past* (Cambridge, 2015), 13, 55.
[291] Ibid., 61.
[292] *Never at Rest*, 550.

that the English text postdates the Latin. As I will show below, the English ‘Original of Religions’ was composed at least five years later.

3.4 Order

So far, I have explored the various chronological treatises found among Newton’s writings, and briefly touched on some of their structural elements, such as marginal paragraph and chapters headings. These headings provide insight in the topics Newton covered, and how he ordered these. They also show that Newton did not have a clear picture in mind of the treatise he was writing. Instead, he seemed to have been experimenting with form and order, perhaps even language. The original ‘Origines’, written with the assistance of his amanuensis, Humphrey Newton, was very much a single tract, using chronological comparisons to prove that the origin of the perversion of the true Noachian religion should be sought in ancient Egypt. Adding more and more material, Newton eventually devised an eleven-fold chapter structure to order his materials, both for himself and for his intended audience. As I noticed earlier, his writing never went beyond a chapter 5. Instead, it seems he recasted the core of his materials in a new format, the Latin version of the ‘Original of Religions’.

The status of the ‘Original of Religions’ in relation to Newton’s other chronological writings appears rather unclear. Historians have discussed it mainly in connection with the ‘Origines’, for good reasons as I have shown above. There are indeed many similarities between both works, with the ‘Original of Religions’ clearly continuing the materials discussed in the earlier treatise. In contrast, the ‘Original of Monarchies’ is mainly discussed as belonging to a new phase in his ideas, in which, as the title suggests, his focus shifted from ancient religion to ancient civilizations. However, the relation between the ‘Original of Religions’ and Newton’s supposedly later writings has been misconstrued. One fact historians have so far either ignored or overlooked is that the ‘Original of Religions’ bears a chapter number. Clearly, Newton meant it as a second chapter to a larger work, followed by the chapter on Egypt. But

what about the first chapter? To find out more about the place of the 'Original of Religions', it is necessary to first acquire a deeper understanding of how Newton ordered his materials. These ordering methods will provide valuable information about the chronology of his chronology, the evolution of his thoughts, and the connections between his writings.

3.4.1 Significant details

It appears that Newton was never easily satisfied with a particular way of phrasing. He would draft sentences over and over again, deleting, adding, deleting the addition, and so on. Take the following passage, from a draft for the *Chronology*, where he was trying to come to grips with the various names of the Egyptian pharaoh Ammon and his son Sesostris:

> And therefore \Eridanus is the Nile &/ ~~Uranus \the Astronomer & first king of Cyrene/~~ is Ammon y^{e} father of Osiris, & Saturn the husband of Pandora ~~& their son Iupiter are Epimetheus (or Hercules) & Amenophis~~ \& brother of Atlas is Epimetheus ~~the brother~~ & his son Jupiter is/ Ammon ~~junior or Amenophis~~ \the younger/ whom the Greeks \call/ Memnon. And Uranus the first king of Cyrene is Ammon the father of Osiris who conquered Libya. ~~So far as his~~ \By his own & his sons ~~co~~/ conquests ~~extended so far he was worshipped as a God~~ |his worship as a God was propagated into many nations|.[293]

For all the deleting and adding, Newton did not insert any new information – the changes are simply a matter of phrasing and rephrasing. With other passages he used numbers to reorder particular words. Discussing the origins of the legendary Cecrops, king of Athens, Newton suggested he must have been one of the Shepherds who once reigned over Egypt 'because he brought into ~~Greece~~ Cyprus the sacrificing of men an impiety the Egyptians were free from. For there a man was yearly sacrificed to Agraulos the daughter of Cecrops.'[294] As **Figure 14a** shows, he then decided to reorder the last line, so it read 'For a man was there sacrificed yearly…', possibly to avoid textual ambiguity. In other passages, he ensured that he had the emphasis right. As he related in **Figure 14b**, 'Pausanias tells us that the first who passed in ships into y^{e} island Sardinia were the Libyans under the command of Sardus the son of

[293] NCL Ms. 361.3, fols. 155^{v}-156^{v}.
[294] NCL Ms. 361.2, fol. 22^{r}.

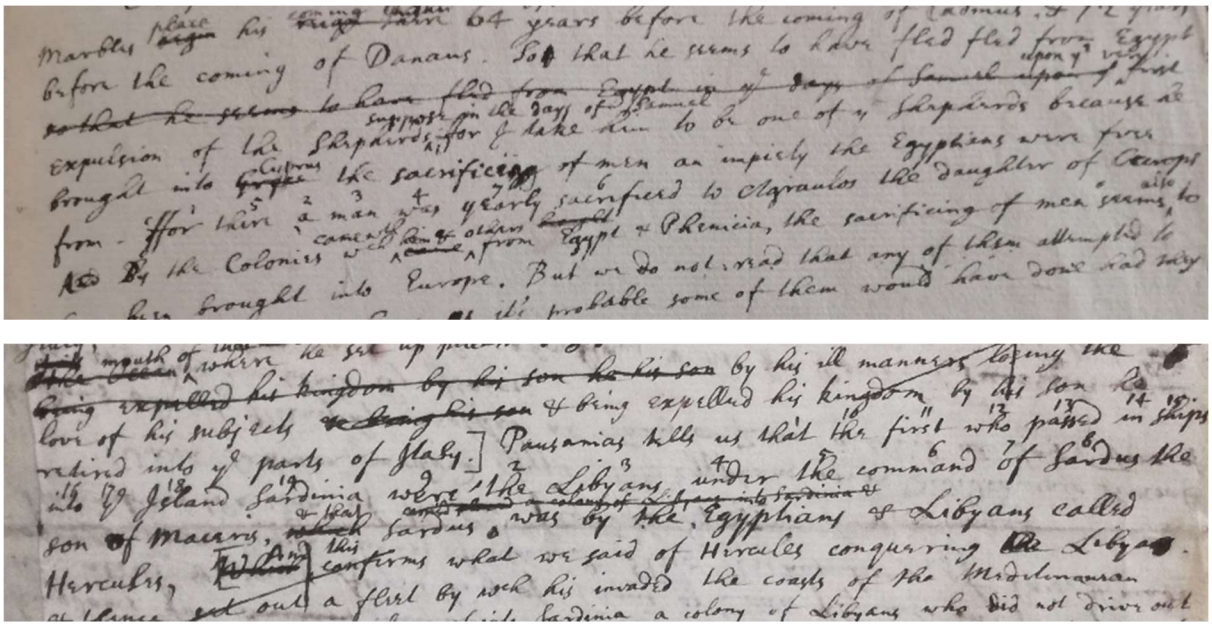


Figure 14a and **b**. Two examples of how Newton reordered sentences by numbering words. NCL Ms. 361.2, fols. 22^{r} and 33^{v}.

Maceris…' Unsatisfied with this word-for-word translation from the Latin, he moved the second part of the sentence to the beginning: 'Pausanias tells us that the Libyans under the command of Sardus the son of Maceris were the first who passed in ships into y^{e} island Sardinia', to highlight the Libya-Sardinia connection. Indeed, in other, presumably later drafts, he applied the latter order, also providing a more exact Pausanias reference and highlighting why this passage mattered: '...Sardus, the son of Maceris, \whom the Egyptians and Libyans called Hercules/….'[295] In this particular case, Newton seemed unsure whether he needed the Sardus story as evidence of Hercules's conquest of Libya, for in the final drafts he removed the passage from the main text. Instead, he included a paragraph on the opposing verso with 'Pausanias' in the main text replaced by 'Historians'; the footnote still read 'Pausan. in Phocis', this time without chapter number. In the end, the passage did not return in the *Chronology*.[296]

[295] NCL Ms. 361.2, fol. 31^{v}; Yahuda Ms. 25.2b, fol. 37^{r}; the reference is to 'Pausan. Phocica c. 17', which reads 'Primi in eam transmigrasse navibus Libyes dicuntur, duce Sardo Maciridis filio', taken from 836 of the 1696 edition Newton owned; the 1613 edition Newton used previously presents *Phocica* without chapter division.

[296] CUL Ms. Add. 3987, fol. 65^{v}; the equivalent main text, with other emendations, is in CUL Ms. Add. 3988, fols. 66^{r}-67^{r}.

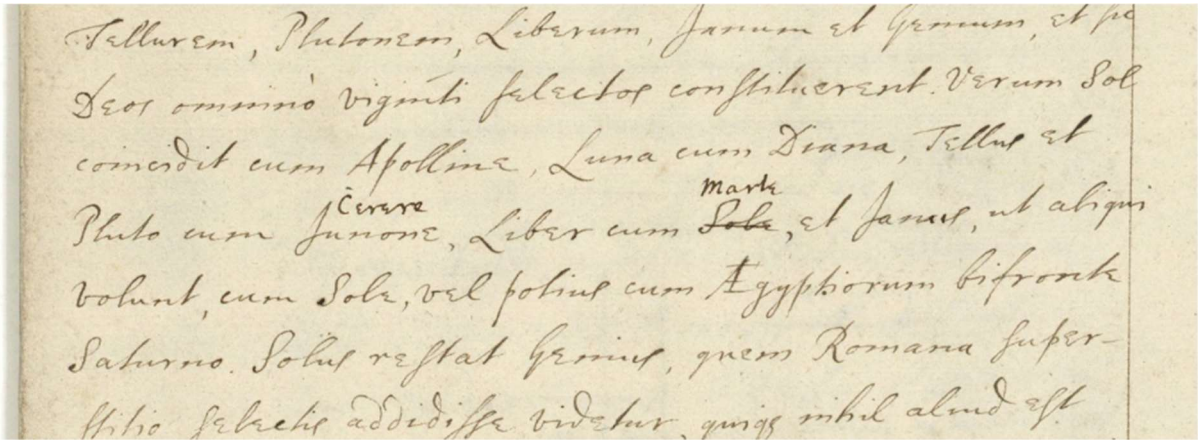


Figure 15. When in doubt… Newton added 'Cerere' above 'Junone', without deleting the latter, illustrating his difficulties with identifying the quintessence. Yahuda Ms. 16.2, fol. 7^{r}.

It appears that in many cases Newton was simply refining his prose. But sometimes seemingly innocuous additions reveal intense intellectual struggles. As an example, take **Figure 15,** from the 'Origines', where Newton tried to identify a list of twelve Egyptian gods found in the surviving lines of a poem by Ennius with the seven planets, the four elements, and the quintessence.[297] Above the text, which is in Humphrey's hand, Newton added two words. The first, 'Marte', was simply a correction, as Humphrey wrote down 'Sole', but 'Sun' had already been equated with Apollo in the previous line. The other addition, 'Cerere', was meant to replace 'Juno', but it seems Newton was not so sure about this and hence did not delete the original. In the earliest version of the text, **OR-1**, he had first equated Tellus with Ceres and Pluto with Juno, but edited the text to read 'Tellus & Pluto with Juno', which is also how the text returned in **OR-2**.[298] Now, he again changed his mind, and for good reason. The identification of either Juno or Ceres with Pluto and 'Tellus' was not straightforward, nor for that matter the exact meaning of the term 'Tellus', Newton's name for the quintessence. He did not elaborate on this fifth element – which is to be distinguished from the regular element Earth, Terra – but only informed us that 'Tellus, which is represented by the four elements, is

[297] Yahuda Ms. 16.2, fol. 7^{r}. The lines from Ennius appear on fol. 5^{r}, and amount to no more than a list of twelve gods: 'Juno, Vesta, Minerva, Ceres, Diana, Venus, Mars, Mercurius, Jovis, Neptunus, Vulcanus, Apollo'. See also J. Fisher, *The* Annals *of Quintus Ennius and the Italic Tradition* (Baltimore, 2014), 10.

[298] 'Tellus ~~cum~~ \&/ ~~Cerere,~~ Pluto cum Junone…', Yahuda Ms. 16.2, fol. 9^{r}

the fifth essence and completes the number twelve.'[299] It is quite probable that he took this description from Servius, who referred to Tellus as the goddess of the Earth in his commentary to Virgil's *Aeneid*.[300] Servius made a clear distinction between the element (Terra) and the goddess (Tellus) and drew parallels between other Roman deities and what they represented: Vulcan and fire, Ceres and produce, Liber and wine. However, the quintessence was traditionally associated with aether, and thus more air-like than earth-like.

In an earlier passage in **OR-B** where Newton tried to harmonise the twelve major gods of the Egyptians with the thirteen gods of the Latins, he provided a revised list of Latin gods and grouped these as follows: 'the Seven Planets (Saturn, Jupiter, Mars, Venus, Mercury, Apollo, Diana), the four Elements (Vulcan, Minerva, Neptune, Ceres), and the Globe of the Earth, Juno.'[301] Here, the quintessence had become 'the Globe of the Earth'. Newton then discussed whether Juno was not actually the same goddess as Minerva, as some writers equated Juno with the element air instead, and from Eusebius and Diodorus he understood that the Egyptians called the air Minerva. It is not entirely clear how – or whether, indeed – Newton settled the debate, and why he decided on Juno over Minerva. He did refer to Varro, though, who equated Juno with Terra and Tellus.[302] But then, where did the sudden change from Juno to Ceres come from? After all, in the list above he identified Ceres with one of the four regular elements, earth. In fact, the confusion might have arisen from another work by the same Varro, *De re rustica* (*On Agriculture*), where Newton would have read: 'And not without reason they called Terra both Mater and Ceres,' referring to Terra Mater, the goddess of the earth, and therefore Tellus.[303]

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[299] 'Tellus quae per Elementa quatuor adumbratur \Quinta~~ssentia~~ essentia est et/ numerum duodenarium complet.' Yahuda Ms. 16.2, fol. 3^{r}.

[300] Servius, *Commentary on the Aeneid of Vergil*, 1.171.

[301] '...Planetas Septem Saturnum, Jovem, Martem, Venerem, Mercurium, Apollinem, Dianam, et Elementa quatuor Vulcanum, Minervam, Neptunum, Cererem & Terrae Globum Junonem.' Yahuda Ms. 16.2, fol. 5^{r}.

[302] 'Sed et Varro l. 3 de lingua latina Junonem Terram et Tellurem esse dicit.' Yahuda Ms. 16.2, fols. 6^{r}-7^{r}.

[303] Varro**,** *On Agriculture*, 3.1.5. See also H. Wagenvoort, *Studies in Roman Literature, Culture and Religion* (Leiden, 1956), 150-68, esp. 161.

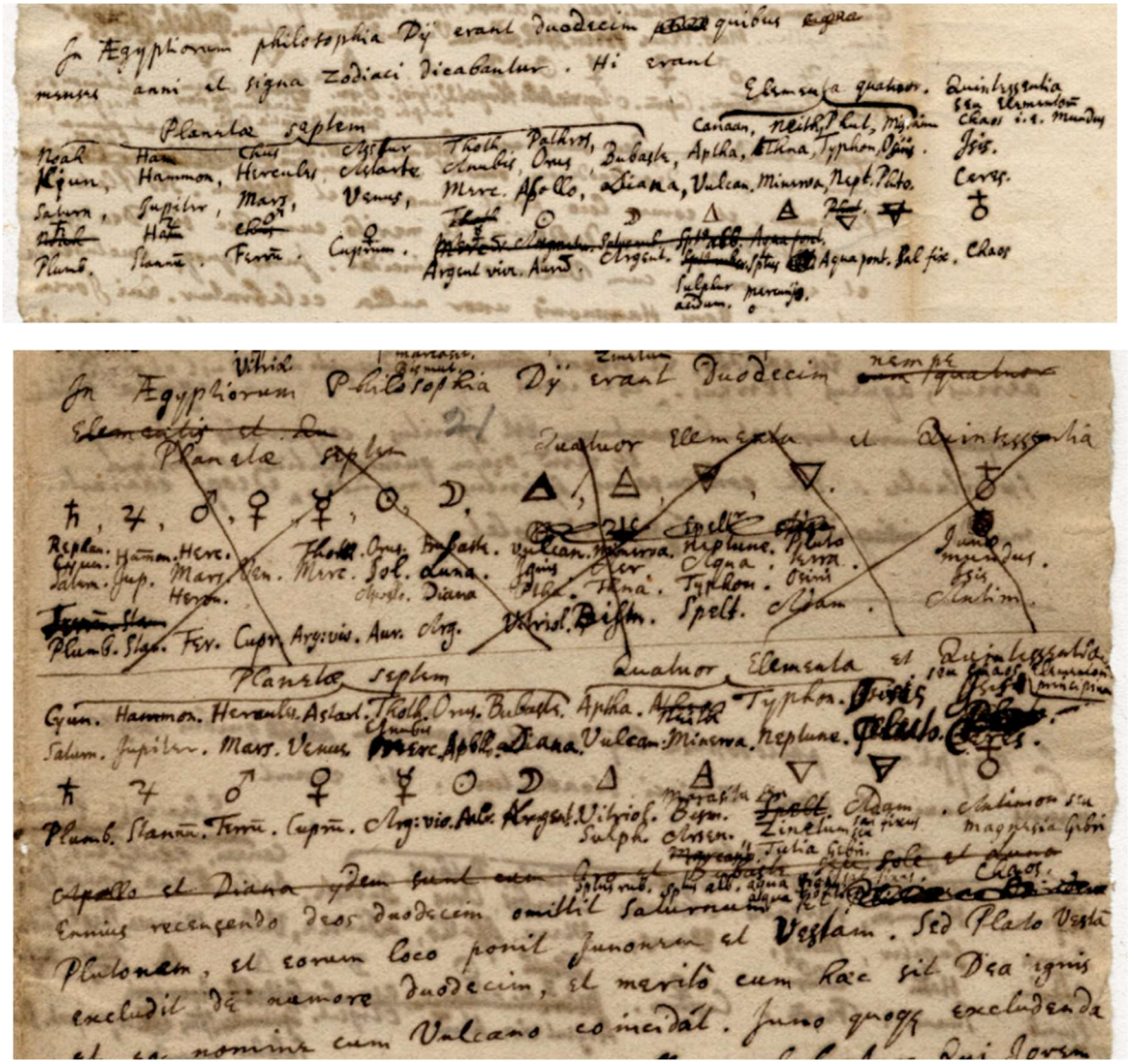


Figure 16a and **b.** Newton's scheme for mapping Noah and his progeny onto the twelve Egyptian and Greek gods, the planets and elements, and their alchemical equivalence, with especially the drafts **(b**) displaying a similar struggle with the quintessence as in the *'Origines'*. Babson Ms. 420, n.f.

Newton's struggle to identify the quintessence is perhaps best illustrated by another manuscript, where he drew a scheme of the various pantheons he attempted to align in the 'Origines'; see **Figure 16a**. This scheme has been discussed, though not in detail, by scholars of Newton's chronology and of his alchemy, as it features on the first pages of what is otherwise an alchemical treatise commonly known as the 'Praxis'.[304] It reminds us that when it came to mythology, Newton drew from a variety of sources, including the works of the

[304] Babson Ms. 420. See B.J.T. Dobbs, *The Janus face of genius: The role of alchemy in Newton's thought* (Cambridge, 1991), 171-72 and 293-305; *Never at Rest*, 359-61; *Orig. of Civ.*, 147-48; K. Figala, 'Newton's Alchemy', in *CCtN*, 370-86.

alchemists Michael Maier and Michael Sendivogius, with references to the twelve major Egyptian gods appearing frequently throughout his alchemical notes.[305] What has so far not been discussed is that the lines directly underneath the drafts for this scheme return in the 'Origines', and explicitly connect the gods with various chemical elements; see **Figure 16b**.[306] Here Newton indeed replaced Juno by Ceres, adding to the quintessence the term 'elementum chaos i.e. mundum', 'the element chaos which is the world'. Likewise, little attention has been paid to Newton's editing of these schemes, which in fact displays the exact same struggle between Juno and Ceres as in the 'Origines'. In the first scheme, under 'Quintessentia', Newton wrote 'Juno, mundus, Isis, Antim', the latter referring to the metal antimony. There is no Ceres, her role instead taken by Pluto.[307] In the second scheme, under the heading 'Quintessentia seu chaos elementum principium', 'Quintessence or chaos, the principal element', and that of the fourth element just left of it, Earth, Newton's inky deletions and additions reveal he originally swapped Isis and Osiris, which he subsequently undid, but also replaced Pluto with another god – here the deletions are too messy to decipher.[308] What can easily be seen though is that under quintessence, Newton overwrote Pluto with Ceres, and that Juno is no longer there. This Juno-Ceres, air-earth ambivalence is also illustrated by his description of the associated chemical element, antimony: 'It is not fire, it is not air, nor water

[305] See, for example, Keynes Mss. 29, fol. 2^{r}, and 32, fol. 2^{v}.

[306] It is clear that Newton went to great lengths to interpret the various alchemical emblems and identify each with their appropriate chemical substance, resulting in particular in the 'Index Chemicus', Keynes Ms. 30.1; see also Keynes Mss. 30.2-5. See R. Westfall, 'Isaac Newton's 'Index Chemicus'', *Ambix*, 22 (1975), 174-85; Figala, 'Newton's Alchemy', 376; L. Kassell, 'Reading for the philosophers' stone', in Frasca-Spada and Jardine, *Books and the Sciences in History*, 132-50, esp. 143-44; id., 'Secrets Revealed: Alchemical Books in Early-Modern England', *History of Science*, 49 (2011), 61-A38, esp. 73. See also K. Figala et al., '*De Scriptoribus Chemicis*: sources for the establishment of Isaac Newton's (al)chemical library', in Harman and Shapiro, *The investigation of difficult things*, 135-80; P. Greenham, 'Isaac Newton, scholar: An exceptional example of normal erudition', *History Compass*, 15 (2017), e12389 (dig. publ.).

[307] Which, when we recall the mythological story from the previous chapter, is slightly ironical.

[308] 'Quintessence or principal element of chaos'. See also Yahuda Ms. 16.2, fol. 44^{r}, where Newton summed up the ambivalence that surrounded Isis and Osiris in mythology: 'Osiris et Isis quandoque tellure et Elemento terrae quandoque de Nilo et terra Ægypti, quandoque etiam de Sole et Luna exponi solent' – 'Osiris and Isis are sometimes interpreted as being the earth [Tellus] and the Element earth, and sometimes the Nile and the land of Egypt, and sometimes even the Sun and Moon'; normalised.

nor earth, but everything. It is fiery, airy, watery, earthy. \It is hot, dry, wet, cold./ It is a watery fire and a fiery water. It is a corporeal spirit and a spiritual body. It is the condensed spirit of the world; it is the noblest quintessence of all things, and therefore it is customarily depicted by the symbol for the world.'[309] The quintessence, then, appeared to be an intriguing subject. With Newton connecting his chronological-religious research to his alchemical reading and practice, which in turn might have informed his search for the cause of gravity, it seems a topic that deserves more attention.[310]

To return to the topic of Newton's ordering principles, the above analysis began with a single added name and a non-deleted original. It is an illustration of what careful and detailed analysis of Newton's editing practices can reveal about his thought processes, and why it matters to gain a deeper understanding of the rationale between his deletions and additions. Obviously, in many cases these deletions were just meant to repair basic writing errors: a misspelling, a doubled word, a mix up of terms or names. At times, Newton would delete entire paragraphs to rewrite these on the opposing or following verso, insert them elsewhere in the text, or indeed remove them altogether. Although some deletions were rather thorough, completely blotting out a passage, this seems to be more a matter of paper and ink, or of repeated deleting and overwriting, than of intended erasure. Most often his deletions consisted of a single strikethrough, be it words, lines, or entire paragraphs where he usually employed a simple cross-out. This had the added advantage of still being able to reuse the deleted passage. Just as with words and sentences, Newton did sometimes think long and hard about whether to delete a passage or not. Here he employed angled brackets, [marking a passage for deletion]. Often, he cancelled the passage indeed, but sometimes he just bracketed it and left it there. At other times, Newton would reconsider a marked passage and delete the angular

[309] 'Magnesia [i.e. 'Antimon seu Magnesia Gebri', 'Antimony or Geber's magnesium'] nec ignis est nec aer nec aqua nec terra, sed omnia. Est igneas, aereus, aqueus terreus. \Est calidus et siccus… humidus et frigidus./ Est ignis aquosus et aqua ignea. Est spiritus corporalis et corpus spirituale. Est condensatus spiritus mundi et rerum omnium quintessentia nobilissima ideoque charactere mundi insigniri solet.' Corrected and expanded translation from W.R. Newman, 'The background to Newton's Chymistry', in *CCtN*, 358-69, quoted from 366.

[310] See in particular Dobbs, *Janus Faces*, 89 ff. and *passim*.

brackets, or even delete the deletion. As I will show, these forms of micro-editing closely mimicked how he ordered and reordered larger structures: paragraphs and chapters.

3.4.2 From words to paragraphs

Just as with sentences, Newton painstakingly crafted each and every paragraph. For every comparatively neat version there are dozens of drafts, and even those neat lines show many emendations. In the second chapter of the *Chronology*, he described how Egypt became divided into small kingdoms, and, thus weakened, 'was invaded & conquered by the Ethiopians under Sabacon, who slew Bocchoris & Nechus & made Anysis fly.' Here Newton tried to prove that Egypt had only briefly been a dominant united monarchy, in the times of Sesac and Rehoboam, the son of Solomon, before it dissolved once again into separate kingdoms that were easily overcome by invaders such as Sabacon. According to Newton, most of the three hundred and thirty kings on Manetho's kings list had not reigned successively but simultaneously, each over their own small kingdom, an argument he most likely took from Vossius; other names on the list were simply fabrications or copying errors.[311] In a later chapter, Newton mentioned again how 'Sabacon the Ethiopian invaded Egypt, & made great multitudes of Egyptians fly from him into Chaldea, & carry \thither/ their Astronomy & Astrology & Architecture, & the form of their year which they preserved there in the Æra of Nabonassar.[312] Both these lines had been reused from folios connected with the New College 'Original of Monarchies' – which I will discuss below – and copied more or less verbatim; the second sentence originally ended with '& carried thither the Egyptian yeare & the study of Astronomy & Astrology. & founded the Æra of Nabonassar.'[313] In fact, Newton had been struggling to describe Sabacon's efforts, as **Figure 17** shows. He discarded his original

[311] *Chronology*, 196-7; the argument can be found in Vossius, *De Theologia Gentili*, 206-12, were Newton dog-eared various passages. See also *Orig. of Civ.*, 222-23; Grafton, 'Rise and Fall', 170-72.
[312] Newton, *Chronology*, 251, 327; CUL Ms. Add. 3988, fols. 71^{r} and 95^{r}.
[313] NCL Ms. 361.1, fols. 123^{r}-124^{r}.

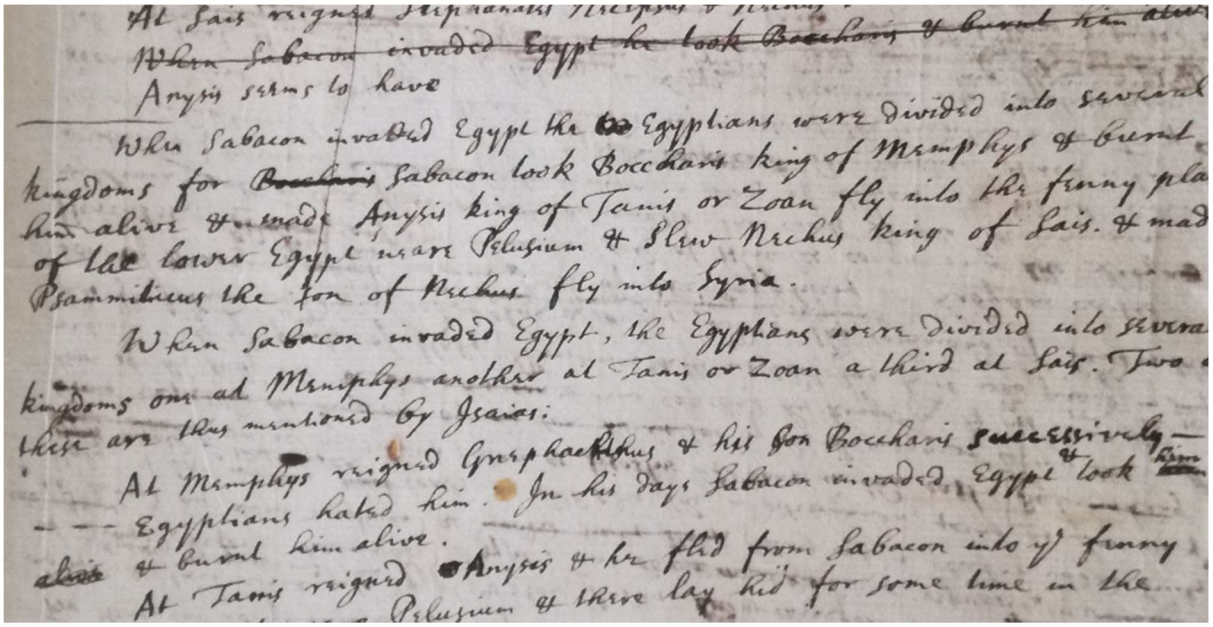


Figure 17. Various drafts for a paragraph on the invasion of Egypt by the Ethiopian Sabacon. NCL Ms. 361.2, fol. 31r.

attempt, 'When Sabacon invaded Egypt he took Boccharis & burnt him alive', and next tried 'When Sabacon invaded Egypt, the Egyptians were divided into several kingdoms for ~~Boccharis~~ Sabacon took Boccharis king of Memphys & burnt him alive & made Anysis king of Tanis or Zoan fly into the fenny places of the lower Egypt mare Pelusium & slew Nechus king of Sais. & made Psammiticus the son of Nechus fly into Syria.' Here he used Sabacon's invasion to highlight the many kings and thus kingdoms present in Egypt, which he originally presented in a separate paragraph written above these lines.

Alas, still not satisfied, Newton crossed out all of this and attempted a third version, in which he initially omitted much of the details of Sabacon's conquests and simply stated that in his time Egypt was divided into several kingdoms, '…one at Memphys another at Tanis or Zoan a third at Sais…' using the references to two of these kingdoms provided by the prophet Isaiah.[314] That is, after 'thus mentioned by Isaias' he added a colon, but subsequently did not provide these passages, nor any information about his sources for the earlier details. In yet another version, Newton provided a variant of the latter passage, but with significant changes: 'At this time Ægypt was divided into two or more kingdomes. One kingdom was at Memphys

[314] NCL Ms. 361.2, fol. 31r.

another at Tanis or Zoan & perhaps a third at Sais. the two first are mentioned by Isaias I will set, saith he, the Egyptians – – – – – shall serve the Assyrians.'[315] Here Newton referred to an existing passage, abbreviated in the same fashion as the notes I discussed in the previous chapter. It is clear that he was no longer so sure about the kingdom of Sais. In the manuscript from which the *Chronology* was printed, then, he wrote that '[o]ne of those Kingdoms was \I think/ at Memphis, under Gnephactus, and his son and successor Bocchoris. \Africanus calls Bocchoris a Saite; but Sais at this time had other Kings/… Another of those Kingdoms was at Anysis (or Hanes Isa XXX.4) under its King Anysis or Amosis. A third was at Sais under Stephanates, Nechepsos & Nechus. And a fourth was at Tanis or Zoan under Petubastes, Osorchon & Psammis.'[316] This time, Newton apparently no longer doubted whether there had been a kingdom at Sais, but, as the added 'I think' shows, was reconsidering Memphis, or more likely the dating of the reign of Gnephactus and Boccharis there. It shows that Newton was still trying to come to terms with the many sources discussing ancient Egypt when he died.

In the same manuscript, the abbreviated quotation from Isaiah – to which he briefly alluded in the passage above when discussing the kingdom at Anysis – had now been moved several paragraphs down, to be used as evidence for both the division of Egypt and its subsequent conquest by the Assyrian king Asserhadon: 'The division of Egypt into more Kingdoms than one both before & after the reign of the Ethiopians, & the conquest of the Egyptians by Asserhadon, the prophet Isaiah seems to allude unto in these words. I will set, saith he, the Egyptians against the Egyptians, & they shall fight every one against against his neighbour, city against city, & Kingdom against Kingdom, & the Spirit of Egypt shall fail. — And the Egyptians will I give over into the hand of a cruel Lord [viz^{t} Asserhadon] & a fierce King shall reign over them… In that day there shall be a high way out of Egypt into Assyria, & the Egyptians shall serve the Assyrians.'[317] Thus Newton wrote and rewrote, ordered and

[315] NCL Ms. 361.3, fol. 96^{r}.
[316] CUL Ms. Add. 3988, fols. 70^{r}-71^{r}.
[317] Ibid., fols. 72^{r}-73^{r}.

reordered the materials he had gathered and was still collecting new materials, judging from the publication dates of the books in his library and the reading tracing found in those. As the above example shows, he used Scripture not just for historical facts: prophetic words were important, and, as I will show in Chapter 4, carried greater historical meaning than recorded history.[318]

3.4.3 Keeping track of chapters

As the plethora of drafts for the *Chronology* show, Newton frequently moved materials from one section to another, and changed the order in which particular topics were discussed. When it came to materials contained within one or two folios, he would often just renumber the paragraphs involved. But with chapters becoming more elaborate, at some point he started to order paragraphs by listing the first words or lines, as can be seen in **Figure 18**. Here Newton listed a series of sections, some spanning more than one paragraph, identified by their first and last words, and by page numbers.[319] This list represents the final transformational scheme Newton applied to the first chapter of the *Chronology*, turning it into the chapter that was eventually published, and to which I will return in Chapter 4.

Newton kept many, if not all of his drafts related to a particular topic or chapter, not just the latest or most polished versions. To keep track of all these materials, Newton used spare folios as files, adding a chapter title as a label. Later, archivists would often use these sheets as title

[318] For example, Pierre-Daniel Huet's *Histoire du commerce et de la navigation des anciens* (Paris, 1716), which Newton read cover to cover, or Johann Fabricius's eigth-volume *Bibliotheca Graeca* (Hamburg, 1705-19); *Library*, 142, 164.
[319] NCL Ms. 361.2, fol. 134^{v}.

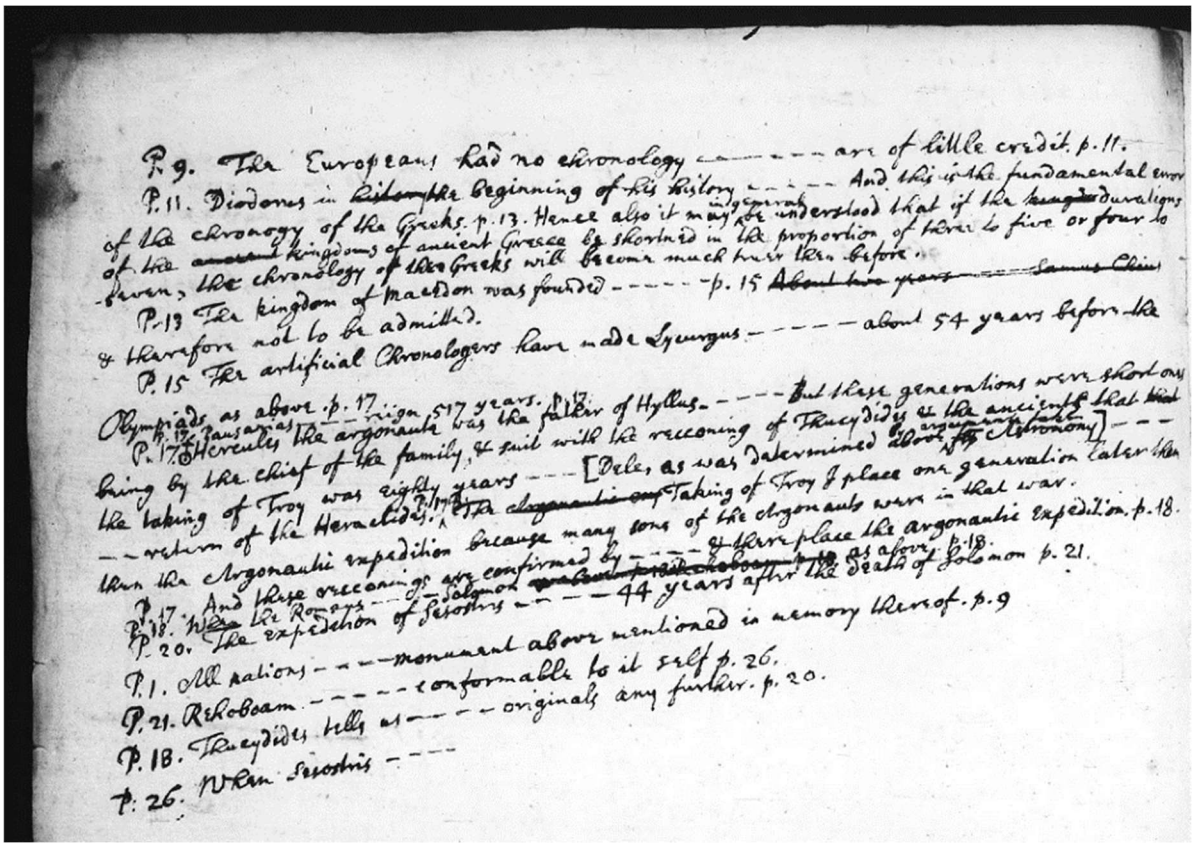


Figure 18. From CUL Ms. Add. 3987 to Ms. Add. 3988: Newton reordering the first chapter of the *Chronology*. NCL Ms. 361.2, fol. 134^{v}.

pages or content dividers. In one of the manuscripts for the *Chronology*, the first three chapters are each preceded by a bifolio with a variant of the chapter title, and an empty second folio. The spine of the bifolio clearly shows the wear and tear of its original use as a file.[320] This is even more visible on the overall master file Newton used to contain the various chapter files as can be seen in **Figure 19**, with its list of six chapters reflecting a particular stage in Newton's writing and editing of around 1726.[321] The file for the second chapter, on the Egyptian monarchy, has two different titles, the first in Latin. With all of his later work in English, one might be tempted to think Newton had been using the file since the 1690s. However, it seems more likely that at a later stage he once more considered writing up and publishing his

[320] See also NCL Ms. 361.2, fols. 245-46, another file for 'Chap. III Of the Assyrian Empire'.

[321] CUL Ms. Add. 3987, fols. 1^{r}-2^{v} (master file), 3^{r}-4^{v}, 49^{r}-50^{v}, and 75^{r}-76^{v} once were files for the first three chapters. Other files can be found in Yahuda Mss. 25.2f, fols. 59^{r-v} (for two chapters relating to the chronology of the Greeks before and since the Trojan war) and 26.2 fols. 0a^{r-v} (another file for Chapter 1). There are similar files for the chapters relating to the prophecies, such as Keynes Ms. 5, fol. 56A.

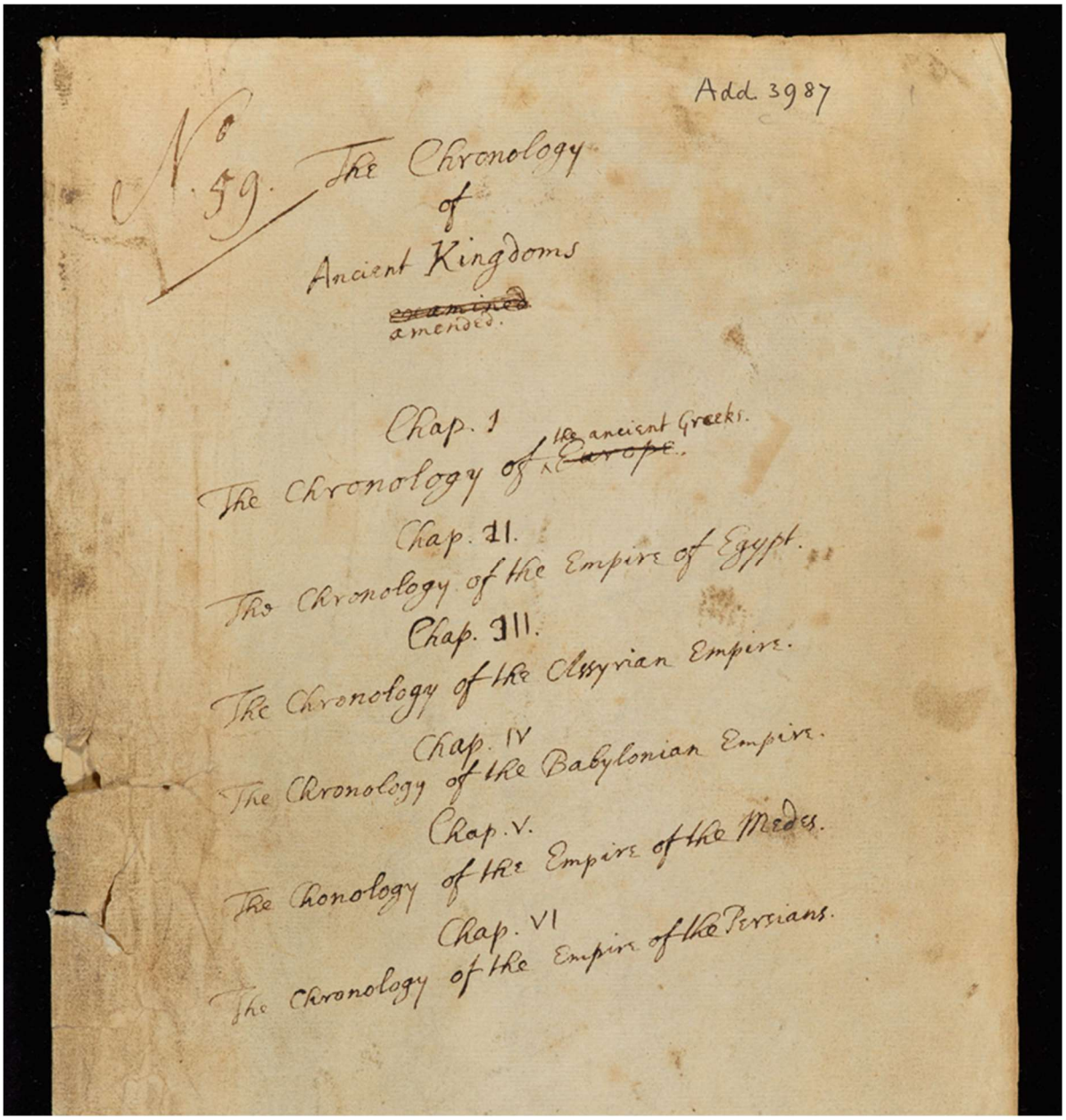


Figure 19. The bifolio Newton used as a master file to contain the various draft chapters related to the *Chronology*, with clearly visible wear. CUL Ms. Add. 3987, fol. 1^{r}.

chronological studies in Latin, perhaps inspired by the French challenge following the *Short Chronicle* which I discussed in Chapter 1. This is evidenced by a nine-page Latin text, headed 'Cap. 1 Chronologia veterum Graecorum & Latinorum emendata', which is a word for word translation of a mature version of first chapter of the *Chronology* – although the odd English word or sentence marks lapses in attention.[322] Apart from Latin versions of the *Short Chronicle*,

[322] The translation covers most of CUL Ms. 3987, fols. 5^{r}-13^{r}. See also Yahuda Ms. 7.1d, fols. 1^{r}-10^{r}.

there are no other such translations among Newton's writings, suggesting he briefly entertained a Latin edition, but eventually decided against it.[323]

From the discussion above and that of the 'Origines' earlier in this chapter, it is evident that Newton's work was in a continuous state of flux. By focussing on how he restructured words and sentences, paragraphs, and chapters, I have shown how he was continuously reordering his materials. Careful analysis of these changes reveals a wealth of information about his thought processes: a single added name – Ceres for Juno – hides a complex struggle for meaning and interpretation.

3.5 Lost in space and time

With so many draft manuscripts, most of which Newton reused and edited at a later stage, it is impossible to establish exact dates for each and every draft, or parts thereof. However, by reconstructing the order in which Newton composed his main writings, such as the 'Original of Religions' and the 'Original of Monarchies', we can at least gain insight in how his thoughts and ideas developed. As I have shown above, the Latin 'Original of Religions' (1696–98) seems to be a direct continuation of the 'Origines'. I will soon return to the English version and establish its place in the chronology of Newton's chronology. First, it is necessary to discuss the various manuscripts generally referred to as the 'Original of Monarchies', which are far less coherent than has been assumed so far.

3.5.1 The 'Originals' of Monarchies

The New College 'Original of Monarchies', bound with other chronological papers, is preceded by an outline that includes setups for at least three chapters; see **Figure 20**. 'Original of

[323] NCL Ms. 361.1, fols. 72^{r}-85^{r}.

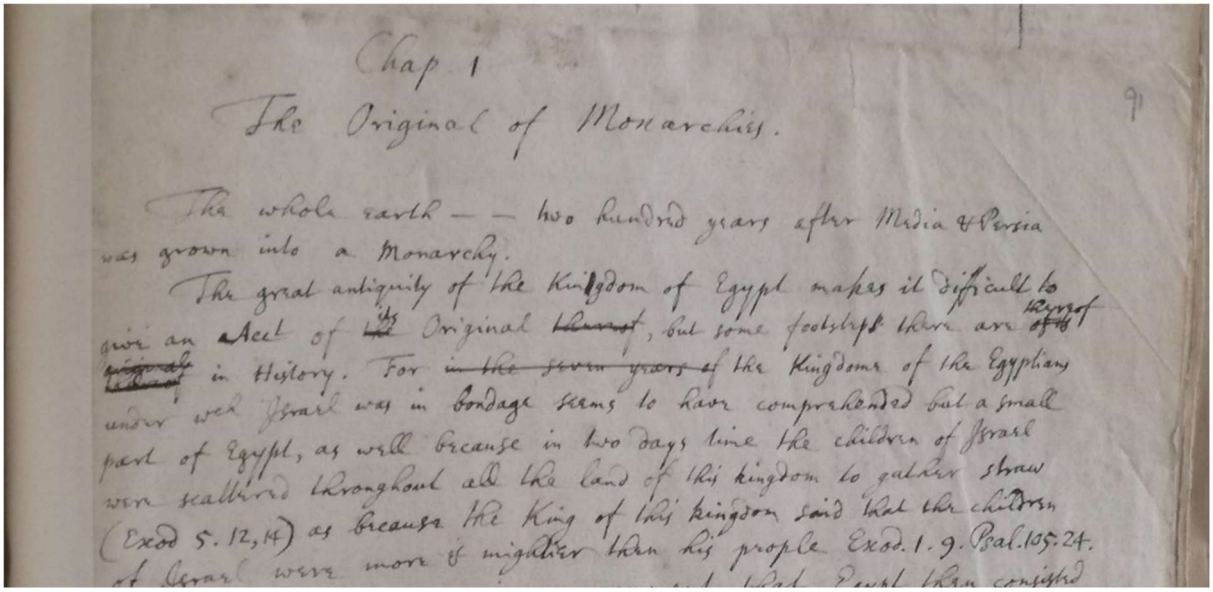

Chap 1
The Original of Monarchies.
The whole earth — — two hundred years after Media & Persia was grown into a Monarchy.
The great antiquity of the Kingdom of Egypt makes it difficult to give an Acct of ~~the~~ its Original ~~thereof~~, but some footsteps there are of it ~~originall thereof~~ in History. For ~~in the seven years~~ of the Kingdome of the Egyptians under wch Israel was in bondage seems to have comprehended but a small part of Egypt, as well because in two days time the children of Israel were scattered throughout all the land of this kingdom to gather straw (Exod 5. 12, 14) as because the King of this kingdom said that the children of Israel were more & mightier than his people Exod. 1. 9. Psal. 105. 24.

Figure 20. The first lines of one of many setups for a work that included the 'Original of Monarchies'. NCL Ms. 361.1, fol. 91^{r}.

Monarchies' was meant as the title of the first chapter of a projected much larger work. A second chapter dealt with the Phoenicians, and a third with the monarchy of Egypt.[324] From the many dashes, it is clear that with the first and second chapter outline Newton was ordering existing drafts. After his outline for the beginning of the third chapter, he started redrafting the following paragraphs, but after two pages the chapter breaks off. What follows are the first pages of a different version of 'Chap.1 The original of Monarchies' from the one described in the outline, which also does not match the Keynes 'Original of Monarchies'. After a few pages of rough draft materials, the next chapter is titled 'Chap. III The Monarchy of Egypt', but again, it is a different chapter from the one mentioned in the outline, which only appears further down the manuscript as 'Chap II. \The Original/ Of the Kingdome of Egypt ~~and chronology of the first ages~~.' Although the heading for the chapter on the Phoenicians is also nowhere to be found, the paragraphs as outlined appear in the additional chapter on Egypt, suggesting that although Newton intended to split the chapter, he never did.[325]

[324] NCL Ms. 361.1, fols. 91^{r}-92^{r}.
[325] See also Yahuda Ms. 25.1e, fols. 8^{r} ff.

From Newton's outline, it is possible to reconstruct the version of the 'Original of Monarchies' he was considering at the time. The first line, 'The whole earth — — two hundred years after Media & Persia was grown into a Monarchy', corresponds to the first twenty-two folios of the Keynes version, but the following full paragraph is a draft for the version found in the Keynes manuscript, and thus precedes it. However, just as with the 'Origines', there are other drafts for parts of the 'Original of Monarchies', though they are much more dispersed and therefore less easily recognisable. In one Yahuda manuscript, there is a partial draft that starts halfway a quote from Dionysius Halicarnassus. The same quote returns in the Keynes version, but after this the text diverges.[326] Textual comparison shows that the Yahuda manuscript contains an earlier version of the text of the second half of the Keynes 'Original'. And indeed, this version has a paragraph ending with 'two hundred years after Media & Persia was grown into a Monarchy', as described in the outline, followed by materials Newton later decided to abandon.[327] The third section in Newton's outline, 'In the seven years of plenty Joseph — — — — And then Sesack made a new regulation of the Nomes & built their Temples more sumptuously' returns in the Keynes manuscript, but must again refer to an earlier version.[328] There is one such version in the previously mentioned Yahuda manuscript, which however starts with '*For* in the seven years…' which is also how the passage returns in several other drafts.[329] The fourth section then, from 'Manetho an Egyptian Priest' to 'who in the Dynasties are named before him', appears in the chapter on the origins of the kingdom of Egypt in the New College manuscript and in a related draft, but must refer to yet another draft, which I have not been able to identify.[330]

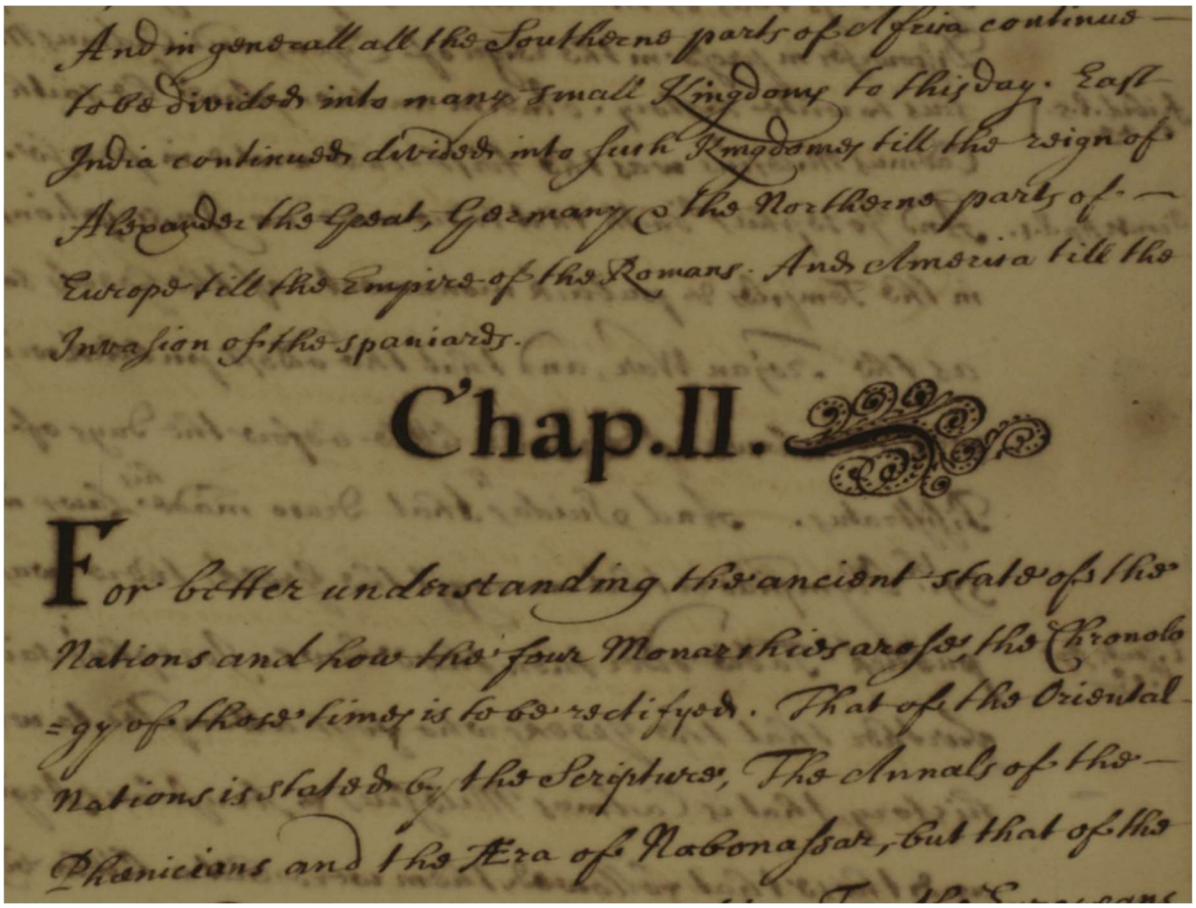
To briefly summarize, the New College 'Original of Monarchies' has in fact only a few pages that can justifiably be said to belong to the eponymous chapter. What follows are drafts for a chapter on Egypt and a long chapter titled 'Chap. 1 \The Introduction/ Of the Chronology of

[326] Keynes Ms. 146, fols. 12^{r}-14^{r}.
[327] Yahuda Ms. 25.2f, fol. 46^{r}.
[328] Keynes Ms. 146, fols. 22^{r}-26^{r}
[329] Yahuda Ms. 25.2f, fols. 47^{r}-50^{r}; drafts in Yahuda Mss. 41, fol. 25^{r}; 25.1e, fol. 1^{r}; and 25.2f, fol. 47^{r}.
[330] NCL Ms. 361.1, fols. 133^{r}-137^{r}; Yahuda Ms. 25.1e, fols. 5^{r}-8^{r}.

the first ages', which contains many sections that return in the *Chronology*. This then is the earliest draft for what would eventually become the first chapter of the *Chronology of Ancient Kingdoms Amended*. The six remaining pages of the New College manuscript, titled 'Chap. 1 The original of Monarchies' appear to be a longer but earlier draft for the first paragraphs of the Keynes version, which in turn consists of two parts, with the second half a rewriting of the materials found among the Yahuda papers.

So far, I have identified three partially different versions of the 'Original of Monarchies': the short New College fragment, the Keynes/Yahuda version, and the Keynes version. Yet Newton produced at least two other versions of the 'Original of Monarchies'. In another Yahuda manuscript are twenty pages in a scribal hand that contain a copy of a different version of the 'Original of Monarchies' from the ones discussed so far.[331] The section is incomplete: it starts and ends in the middle of a paragraph; from Newton's numbering of the bifolios we can infer that it was originally preceded by another twenty pages. Approximately halfway, there is a neat heading for a second chapter, without a title, see **Figure 21**, suggesting that Manuel might have been right after all that Newton at one time considered 'The Original of Monarchies' as an overall title for the work.[332] It is clear that this copy is made from a version that postdates the Keynes manuscript, since passages that Newton deleted there do not return in the main text, while added sections do. With the Keynes version branching off halfway where the older Yahuda fragment had a much longer continuation of the Dionysius quote after 'Afterwards' – the scribal version cut the quote short before that: the word 'Afterwards' is written down, but subsequently deleted.[333] It is in fact one of the few deletions in the entire manuscript, which is unusually neat and seemingly ready for circulation or even publication.

[331] Yahuda Ms. 25.2f, fols. 34^{r}-43^{v}.
[332] See *Historian*, 133, where he suggests that 'at one stage Newton contemplated an overall title such as 'The Original of Monarchies,' or 'The Origin of Kingdoms'', but does not provide evidence for this conjecture.
[333] See Yahuda Ms. 25.2f, fol. 35^{r}.


And in generall all the Southerne parts of Affrica continue
to be divided into many small Kingdoms to this day. East
India continued divided into such Kingdoms till the reign of
Alexander the Great, Germany & the Northern parts of
Europe till the Empire of the Romans. And America till the
Invasion of the Spaniards.

Chap. II.

For better understanding the ancient state of the
Nations and how their four Monarchies arose, the Chronol-
-ogy of those times is to be rectified. That of the Oriental
Nations is stated by the Scriptures, The Annals of the
Phenicians and the Æra of Nabonassar, but that of the

Figure 21. Scribal copy of parts of two chapters, related to the Keynes 'Original of Monarchies'. Yahuda Ms. 25.2f, fol. 39^{r}.

There are some very intriguing aspects about this fragment. For one, it contains significant additions to the main text of the Keynes/Yahuda version, including entire paragraphs that do not return in future reworkings of the 'Original of Monarchies' into the *Chronology*. For example, in his discussion of how kingdoms emerged from cities, Newton now also included ample passages from the book of Genesis on how the cities that Abraham encountered were all still rather small. Likewise, in his discussion of how people originally lived in caves, he referred to the travel stories of Jean Baptise Tavernier who described similar dwellings in Syria, Mesopotamia and Assyria.[334] Perhaps more striking is the fact that these unique additions are found nowhere else in the corpus: there are no matching drafts in Newton's

[334] Ibid., fols. 35^{v}-37^{r}; Mesopotamia and Assyria correspond to modern day Iraq and south-eastern Turkey. Newton owned a copy of Tavernier's *Collections of travels through Turky into Persia, and the East-Indies...* (London, 1684) and took notes from it whilst reading for the *'Origines'*; see APS Ms. Temp. 3. Miss., fol. 23; see also *Library*, 248.

hand.[335] From the deleted 'Afterwards', and from the difference in ink and spacing of the words in the following text, it appears the scribe was copying from the Keynes manuscript until Newton instructed him to stop there. Lest one assumes that he subsequently started dictating new materials, the added text – which at times covers entire pages – appears far too neat to have been communicated orally. It might not be possible to solve the mystery of this particular copy, but it can be dated relative to the other materials. In a paragraph that does return in the Keynes version, Newton, referring to Spain, wrote 'For Strabo speaking in generall of the Collonies which the Greeks sent abroad into this and other Nations said The reason why the Greeks wandered to the barbarous nations seems to be the distraction of those Nations into small parties and Dynasties as such as through haughtiness would not combine with one another.'[336] There is another version of this passage in the same manuscript, in the precursor for the second half of the Keynes 'Original of Monarchies', where the words 'in general' and 'into this & other nations' are added above the line, which thus predates the scribal copy.[337] Although it does not match the scribal copy word for word, it seems highly likely that the scribe copied from these folios. The fragment then postdates both the Keynes/Yahuda and the Keynes 'Original of Monarchies'.

There is one other version of the 'Original of Monarchies' which seems to represent the first stage after the 'Origines'. It is a single bifolio that connects with a sheet from another manuscript, preceding it, titled 'Chap. 1. Of the Original of Monarchies', which starts with the same words as the New College version: 'The whole earth was by the first inhabitants divided into many coordinate governments according to y^{e} number of families.'[338] Although the folio with which it was once connected at first appears to start anew, 'The world was at first governed by kings & kings were then both Law-givers & Judges…', this turns out to be

[335] There are some abbreviated paragraphs in the New College manuscripts that seem related, see NCL Ms. 361.3, fols 1^{r}, 166^{r} and 215^{r}, related to Yahuda Mss. 25.2f, fols. 39^{r}, 43^{r}, and 34^{r}, respectively.
[336] Yahuda Ms. 25.2f, fols. 38^{r}-^{v}.
[337] Ibid., fol. 45^{r}.
[338] Yahuda Mss. 25.1d, fols. 1^{r}-2^{v}, and 7.1a, fol. 1^{r-v}; see also NCL Ms. 361.1, fol. 93^{r}.

Newton's partial translation of the Latin quote with which the first sheet ends, 'Principio rerum, gentium nationumque imperium penes reges erat...' In the New College version, where the quote returns, Newton decided to refrain from a translation, instead – by using a larger font – highlighting the key passage that kings only reigned 'intra suam cuique patriam...', 'within their own country...'[339] In the remainder of the short fragment, and in the subsequent New College version, Newton connected with his pilot research: 'Every father at first was a king. For y^{e} four ~~ages~~ first ages so much celebrated by y^{e} Poets are y^{e} ages of the four first generations of Kings \& those kings were only fathers/ ~~Noah was y^{e} first king~~ Noah \is that Saturn who/ reigned in y^{e} golden age ~~...the division~~ & Ham that Jupiter who reigned in y^{e} silver age. For this theology was originally Egyptian & the Egyptian Jupiter is Jupiter Hammon.'[340] Here Newton reappropriated the research he began with the 'Origines': instead of unravelling mythological chronology and mapping the various pantheons onto each other to trace back the origin of idolatry, he now used his data to establish the origin of monarchies, and, more importantly, their extent in time and space. Returning to the Four Ages of Man described in Ovid, Hesiod, and Virgil, he related how the sons and grandsons of Noah's son Ham were indeed called kings, but 'each reigned over nothing more then his Family,' demonstrating that 'untill y^{e} rise of y^{e} four Monarchies' kingdoms were small.[341] These four monarchies were the monarchies from the prophetical visions in the book of Daniel, which I discussed in the first chapter, and to which I will return in Chapter 4.

3.5.2 From 'Origines' to 'Originals'

The Four Ages of Man would remain Newton's framework for the earliest generations after the Flood throughout his chronological writings, all the way to the *Chronology*. What originally began as a very short introduction, spanning less than two folios, had by then developed into a forty-folio chapter, almost as long as the other five chapters of the *Chronology* combined.

[339] Yahuda Ms. 7.1a, fol. 1^{v}; NCL Ms. 361.1, fol. 94^{v}.
[340] Yahuda Ms. 25.1d, fol. 1^{r}.
[341] NCL Ms. 361.1, fol. 94^{v}; Yahuda Ms. 25.1d, fol. 1^{v}.

But there was one important, intermediate stage, where the Four Ages framework seems surprisingly absent: the Keynes 'Original of Monarchies'. Neither in the earlier Keynes/Yahuda version, nor in the Keynes version as it is preserved today, did Newton ever mention the Golden or Silver Age, or Jupiter Hammon. These did however return in the 'Original of Religions', of which I have so far not dated the English parts, nor incorporated it in the chronology of Newton's chronology. What is important here is that the 'Original of Religions', in both its Latin and English instalment, had always been a second chapter, begging the question of which chapter ought to precede it. That chapter turns out to be *Chap. I. The* 'Original of Monarchies'. In the first paragraph of the 'Original of Religions', Newton wrote that 'the religion most ancient and most generally received… was that of the Prytanea or Vestal Temples… [T]he Greeks had Prytanea in all their cities, as you may understand by y^{e} passages newly cited out of Thucydides \~~Halicarnasseus~~ & Plutarch/.'[342] The passages he referred to are both in the 'Original of Monarchies'. In the Keynes version, Newton quoted from Thucydides 'Under Cecrops, saith he, & the ancient kings untill Theseus, Attica always κατὰ πολεῖς ὠκειτο, πρυτανεῖα τι ἔχουσα καὶ ἄρχοντας was inhabited city by city, having… magistrates & Prytanea or Courts with y^{e} Vestal fire adjoyning.'[343] And, as he continued, '[t]o the same purpose Plutarch also relates... [of] the Prytanea & Courts & Magistracy w^{ch} they had in their several cities & erected in Athens one Prytaneum & Court common to them all, w^{ch}, saith Plutarch is still there to be seen.'[344] Though not underlined here, from an earlier draft of the passage it is clear that this, too, is a citation.[345] The deleted reference to Dionysius Halicarnassus above relates to the New College fragment, where the Thucydides quote is followed by a short paragraph on the rise of kingdoms in Italy. Here Newton wrote 'For when Romulus founded Rome the dominion of the Latins was but |a| small \part of Italy/ & yet consisted of 30 Courts or Councils in so many towns each wth the sacred fire in the kept in the

[342] Yahuda Ms. 41, fol. 1^{r}.
[343] Keynes Ms. 146, fol. 7^{r}; see also NCL Ms. 361.1, fol. 94^{r}, where the passage returns.
[344] Keynes Ms. 146, fol. 8^{r}.
[345] See NCL Ms. 361.3, fol. 181^{r}.

Prytanaeum or Court…' with a note referring to Dionysius.[346] This suggests that Newton wrote these lines from the 'Original of Religions' with the Keynes 'Original of Monarchies' in front of him, perhaps while still working on it, where he had not immediately marked the Plutarch quote as such but had indeed removed the passage from Dionysus he used in the earlier New College draft. Likewise, Newton began the second paragraph of the 'Original of Religions' with: 'The like custome was in the cities of Italy before y^{e} founding of Rome as you have heard above.'[347] The custom Newton discussed was the performance of sacred rites by the magistrates of the city, who took on a dual role as priest, much like the enigmatic Melchizedek found in Scripture.[348] 'Above' here again referred to the Keynes 'Original of Monarchies', where Newton discussed the rise of kingdoms in Italy.[349]

That the 'Original of Monarchies' and the 'Original of Religions' were part of the same work has significant implications for our understanding of both of these chapters, and of the project Newton was working on as a whole. But what did that project look like? With the 'Origines', Newton provided a content overview; with the *Chronology*, there are the master files I discussed above, which show its evolution, and the finished volume. But there are no such outlines or files for the various in-between phases. What we do have are at least five different versions of a first chapter titled 'Original of Monarchies', and hundreds of other chapters that clearly predate the *Chronology*. Many of these are incomplete; others are dispersed over several manuscripts. Most have chapter headings, others are less easily recognisable.

To see how the 'Origines' evolved into the 'Originals' – the work that at some point included the 'Original of Monarchies' and the 'Original of Religions' – I provide a tentative order of the chapters I have been able to identify. This overview is non-exhaustive: it is clear that not all

[346] NCL 361.1, fol. 94^{v}.
[347] Yahuda Ms. 41, fol. 1^{r}.
[348] See Gen. 14:18, Ps. 110:4, and Heb. 7:1 ff.
[349] Keynes Ms. 146, fol. 11^{r}.

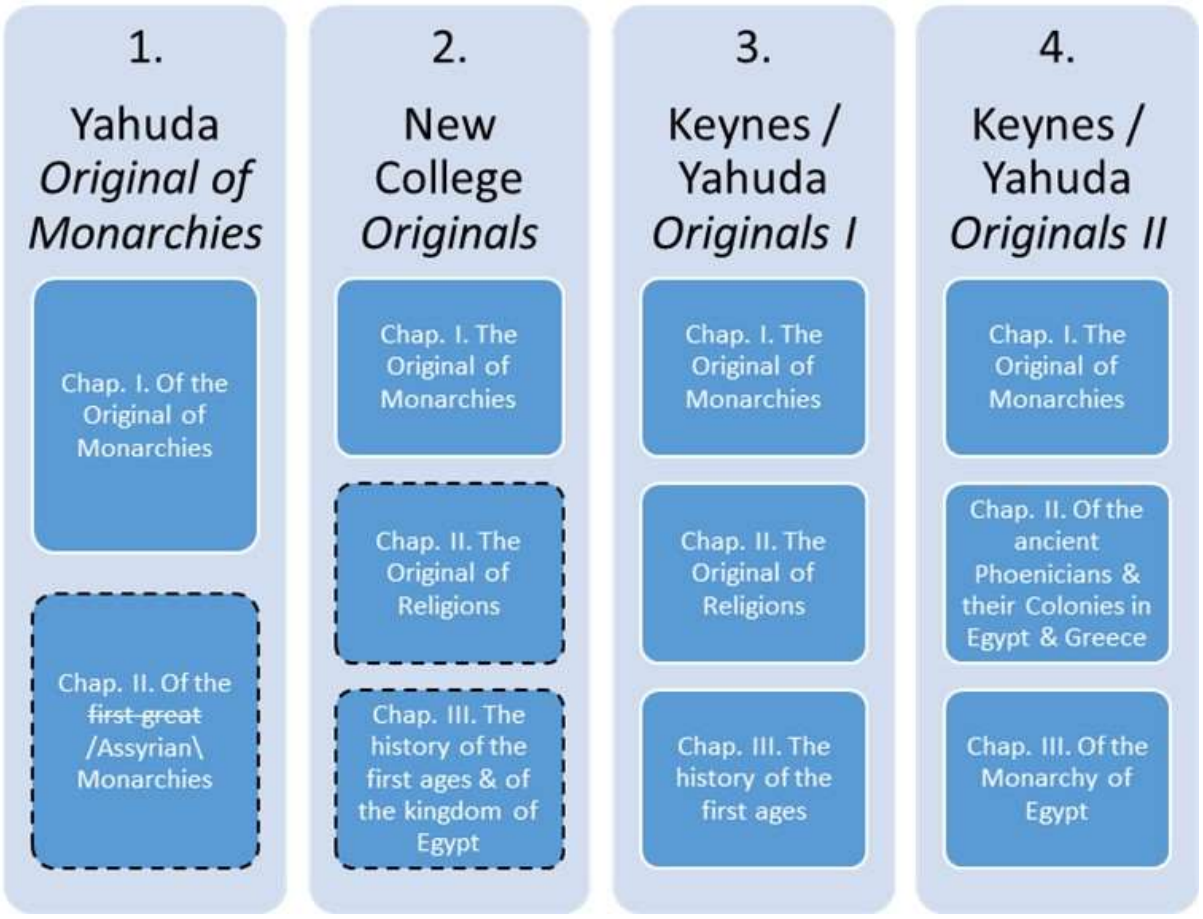


Figure 22a. Phases **1**-**4** from *'Origines'* to proto-*Chronology*; dashed sections are conjectural.

the manuscripts have survived, and it is not always clear what the missing chapters contained. **Figures 22a** and **b** show how Newton continued from the Latin version of the 'Original of Religions' he composed during the mid-1690s; for a detailed description of the various manuscript fragments, see Appendix B. 'Chap. 1. Of the Original of Monarchies', contained in various Yahuda manuscripts, is clearly the oldest version of the chapter **(1)**. It is incomplete, and includes an added heading for a second chapter on the Assyrian Monarchies. It is succeeded by **(2)** the fragmentary New College version of the 'Original of Monarchies', which might have continued with the chapters on the origin of religion and Egypt. By the time Newton had composed the first version **(3)** of what is now the Keynes 'Original of Monarchies', those chapters were clearly present, as I discussed above. Before Newton arrived at the Keynes version, the chapter outline in the *New College* manuscript shows an in-between stage **(4)** in which Newton considered devoting a separate chapter to the Phoenicians and reordered his

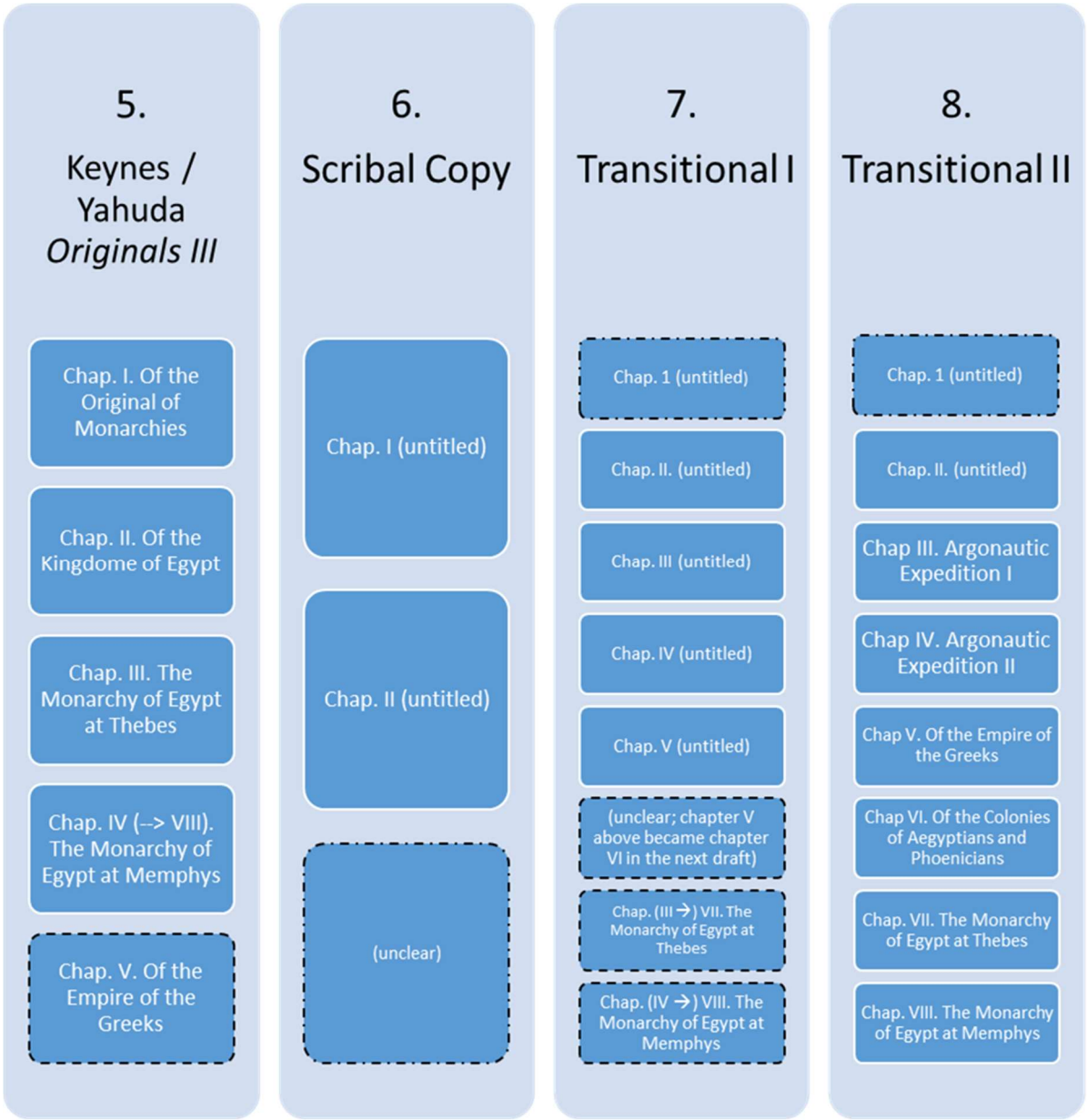


Figure 22b. Phases **5**-**8** from *'Origines'* to proto-*Chronology*; dashed sections are conjectural.

materials on Egypt, but it is not known whether he actually wrote these chapters. What is clear is that the 'Original of Religions' is no longer present as a separate chapter. Instead, with **(5)** Newton had included a short paragraph at the end of the first chapter, once more describing the dual politico-religious function of the *prytaneum* and reiterating that all ancient kings had been priests. This implied that every city that had a *prytaneum* had once been a capital city or small kingdom. In Egypt, these kingdoms grew large until in the days of King Solomon they had become a single, great monarchy. Here, Newton also quoted approvingly from Pliny and

Strabo that Thebes, Egypt's capital at the time and modern-day Luxor, had been famous in the days of Homer, whilst the poet did not even mention the Assyrians or Medes.[350] He worked out these details in a second chapter, with two more chapters devoted to the kingdoms of Egypt at Thebes and Memphis, where according to Herodotus and Diodorus the first Egyptian kings had reigned. Of **(6)**, all that remains is the copy Newton had made at some point by an unknown scribe, which contains part of a first and second chapter, numbered but untitled. Neither of these can be identified as a direct continuation of the 'Original of Monarchies' chapter from previous versions. Instead, it seems Newton had divided up the 'Original', with the first chapter containing the now familiar narrative of how small kingdoms had grown large. The second chapter then was devoted to a technical analysis of the dates of the Olympiads and the average reigns of ancient and modern kings. It was a calculation designed to rebuke the often lengthy reigns found in Manetho and other ancient historians, which Newton first included in **(3)** and which would remain a hallmark of his chronology; I will return to this below.

The absence of chapter titles is also witnessed in **(7)**, dealing with ancient Egypt but also in more and more detail with the history of Greece, in which Newton divided up a long second chapter into four separate chapters which he then worked out in **(8)**. What had so far been a by-line, the expedition of the Argonauts led by Jason, now became a focal point. It is here, in **(7)** and **(8)**, that Newton first began to use the technical arguments from astronomy that would return in the *Chronology*; hence why I named these versions 'transitional'. In earlier renditions of the passage, Newton had briefly alluded to Chiron the Centaur whom he had identified as an astronomer in the mid-1690s.[351] In a draft related to the Latin 'Original of Religions', he wrote that all the constellations were derived from Greek and Egyptian mythology. There, Newton employed this observation to show how the Greeks had learned astronomy from the Egyptians. Here, Newton focussed even more closely on exactly what the constellations depicted, and argued that they had to have been delineated at the time of the Argonautic

[350] Keynes Ms. 146, fols. 25^{r}-26^{r}; see also *Orig. of Civ.*, 230.
[351] Yahuda Mss. 17.2, fol. 6^{r-v}; 25.1aV, fol. 6^{r}.

Expedition.[352] Using his understanding of the precession of the equinoxes, which results in a shift of the positions of the stars relatively to Earth by about one degree in every 72 years, he calculated dates for the Expedition and the Fall of Troy. Although he never explicitly mentioned any dates in this chapter, and worked primarily with generations, it is clear Newton must have had at least a partial timeline at hand, as illustrated by lines like '…the Argonautic Expedition was about 413 years earlier then the death of Cyrus, & by consequence about 39 years later then the death of Solomon.'[353] What also returned, this time in full, was a chapter on the Egyptian and Phoenician colonies, for which Newton borrowed from Selden as I discussed above. This chapter dealt mainly with the elusive Shepherds, or *Hyksos*, a people who at one time ruled over Egypt and were expelled in the days of the earliest kings of Israel. Often mistaken for the Israelites in the times of Moses, Newton suggested that they were the Canaanites driven out of Israel by Joshua, some four hundred and fifty years later.[354] Later, multitudes of these Shepherds fled to Philistia, Phoenicia, and further north to Greece, where they introduced a mixture of their own and Egyptian culture, thus supporting his argument that civilization, including ancestor worship, had spread from Egypt.

Eventually, **(8)** would evolve into the first chapters of *Chronology of Ancient Kingdoms Amended*. What is notably absent from each of the eight versions of the 'Origines', is a prolonged discussion of the empires of the Assyrians, Babylonians, Medes, and Persians as found in his final work. There, Newton devoted entire chapters to these kingdoms, but here only the earliest version contained a short chapter that dealt with Assyria. True, in the 'Original of Monarchies' chapters, Newton briefly covered some of the particulars of these four empires, but nowhere did he ever elevate these descriptions to the status of chapters as he would later do. Yet from his discussion of their details and their sporadic inclusion in other chapters, it is

[352] Yahuda Ms. 25.2d, fols. 2^{r}-3^{r} and 7^{r}. See *Orig. of Civ.*, 246-99 for an elaborate discussion of how Newton employed astronomical data in his chronological research. See also *Historian*, 81-87;
Y. Nazé, 'Astronomie et chronologie chez Newton - arguments astronomiques à l'appui de la chronologie de Newton', *Archives Internationales d'Histoire des Sciences*, 62 (2012), 717-65.
[353] Yahuda Ms. 25.2e, fols. 5^{r}-6^{r}.
[354] Yahuda Ms. 25.2c, fols. 1^{r}-2^{r}; Joshua 3:10 and *passim*. See also *Chronology*, 9-11 and *passim*.

clear that he had studied the chronology of these empires in depth. As I will show in Chapter 4, he had indeed done so, coming at it from a different yet closely related project.

So far, I have discussed the various stages in which Newton's chronological work developed, from the 'Origines' to the 'Originals'. The identification of the 'Original of Religions' as part of the same treatise as the 'Original of Monarchies' has far-reaching consequences for our understanding of Newton's chronological research, which I will discuss below. First, I will use the results of the above reconstruction to establish a revised and much more precise dating of these writings than has been provided so far.

3.5.3 Dating royalty

When the Keynes manuscripts became available, in the 1950s, it did not take long for Frank Manuel to single out one manuscript, the Keynes 'Original of Monarchies' – **(5-I)** above – as having 'an individual quality… it stands out in its own right, for its sets forth Newton's theory on the beginning, growth, and consolidation of ancient empires in a manner not found in any of his printed historical writings.'[355] In fact, many of the materials found in the Keynes version of the 'Original of Monarchies' returned in the *Chronology*, and in a much more elaborate fashion. Based on his analysis of Newton's handwriting, Manuel concluded that a 1693–94 date for the 'Original of Monarchies' was probable, and that Newton must have written it before he left Cambridge for London.[356] Richard Westfall, who grouped together most of Newton's pre-*Chronology* writings, suggested that the work was written in the mid-1680s, and that **(6)**, the scribal copy, might have been prepared for Princess Caroline, before Newton decided on the *Short Chronicle*. The 'Original of Religions', which Manuel did not inspect, Westfall considered to date from the early 1690s.[357]

[355] *Historian*, 12.
[356] Ibid., 198.
[357] Westfall, 'Theological Manuscripts', 136, 141-42; id., 'Origines', 17.

Manuel did not explain *why* a past 1696 date for the Keynes 'Original of Monarchies' would be so unlikely. Ironically, it is exactly in the contents he so deeply studied where he would have found rather precise *termini post* and *ante quem*: 8 March 1701/02 and 1 August 1714. These two termini can be derived from Newton's use of ancient and contemporary monarchical data, in a passage which would also return in the *Chronology*. As part of an argument to reduce what he considered exaggerated monarchical reigns to more acceptable figures, he computed the average lengths of the reigns of various rulers, including '[t]he 28 Kings of England (William the Conqueror & his successors) 635 ½ years w^{ch} is 22 ⅔ years a piece.'[358] With William's reign commencing Christmas Day 1066, adding 635 ½ years (a rounded figure) brings us to the middle of 1702, which coincides with William of Orange's death in March 1702. Hence this version of the 'Original of Monarchies' must have been composed after that date, during the reign of the next monarch.[359] And indeed, in a draft for the *Chronology* Newton included different figures: 'The 29 Kings of England (William the Conqueror &c) reigned 648 years, w^{ch} is 22 ⅓ years a piece.'[360] Lest we too easily assume that this version was written after 1 August 1714, when Queen Anne died, and Newton would have been able to add another completed reign to his calculations, a closer inspection shows that Newton edited the figures in the manuscript, overwriting 28 with 29, 635 ⅔ with 648, and 22 ⅔ with 22 ⅓. Obviously, these emendations were made after 1 August 1714, but it shows that the passage and the surrounding text were probably composed before then.

How Newton actually arrived at 28 and 29 kings, appears slightly more mysterious, as he never provided any detailed list of kings in his drafts. Fortunately, among the thousands of draft pages and snippets, there is an envelope addressed to him at St Martin's street – where he lived from the middle of 1710 until early 1725 – on the edge of which he listed the reigns

[358] Keynes Ms. 146, fol. 15^{r}.
[359] But not, as Buchwald and Feingold claim, during the summer of 1702, immediately after Orange's death. With one exception, which I address in the text, Newton invariably used completed reigns. *Orig. of Civ.*, 195.
[360] NCL Ms. 361.1, fol. 105^{r}.

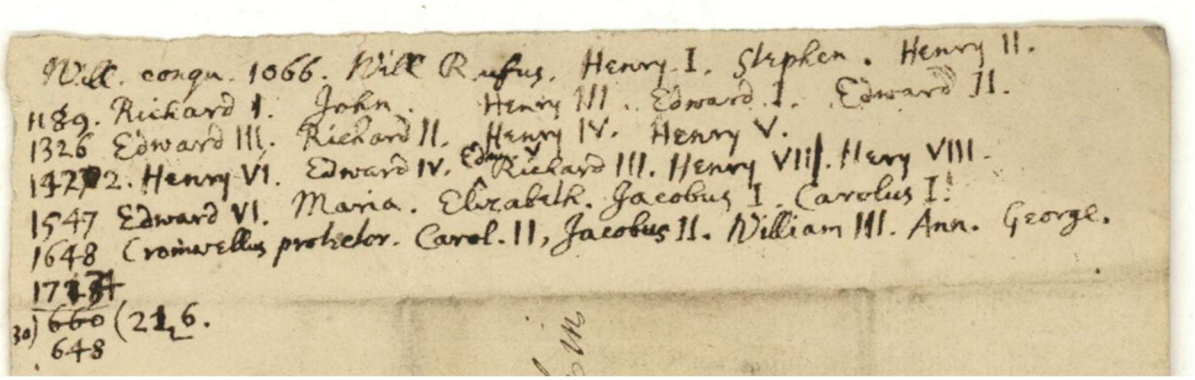


Figure 23. Newton's calculations for the average length of the reigns of the kings of England, written on the back of an envelope in 1726. Yahuda Ms. 7.3o, fol. 4ʳ.

he included; see **Figure 23**.[361] What is remarkable is not so much that Newton listed 'Cromwellus protector' as one of his kings – a reign is a reign – but that it has 31 names, including George, who was still reigning. Although he made corrections to both total and average, the divisor remained at 30. From the overwritten figures on the left, it appears Newton tried out a few things. From the onset, he counted the two reigns of both Henry VI and Edward IV as one each.[362] With the average reign for the kings of England rather high compared to his overall spread, of 18 to 20 years, he first decided to include the incomplete reign of George I, totalling up to 660 years for an average of exactly 22 years.[363] Incidentally, this also allows us to date the calculation as done in 1726, adding 660 to 1066; which is indeed the year Newton wrote down initially.[364] It seems he then decided against the inclusion of George; perhaps it felt too much like cheating to add an incomplete reign, or perhaps because the resulting average was not significantly lower than the 22 ⅓ he arrived at earlier. He subsequently decided to remove George and instead add Edward V's zero-year reign, as if

[361] *Never at Rest*, 670-71, 866; Yahuda Ms. 7.3o, fol. 4ʳ.
[362] During the Wars of the Roses (1455-85), the throne passed back and forth. Beginning with Henry VI's first reign (1422-61), the throne passed to Edward IV (1460-71), then back to Henry VI (1470-71), and then again to Edward IV (1471-83). See M.A. Hicks, *The Wars of the Roses* (New Haven and London, 2010), xiii-xv.
[363] *Chronology*, 8, 52.
[364] Newton wrote several numbers one over the other. The 1 over the 2 is clearly identifiable; and so is the final 4, returning to the original 1714 when Anne's reign ended. It also appears that the final digit was once a 7, but 1717 does not make sense, nor did Newton live long enough to see 1727: he died 20 March 1726 OS.

accidentally forgotten, allowing him to divide 648 by 30 instead of 29 and arriving at an average of 21.6 years. This explains why, in the manuscript from which the *Chronology* was printed, he overwrote 29 with 30, kept the same total number of years, but changed the average to 21½.[365]

So far, when it comes to dating the various versions of the 'Originals', those that include the Keynes 'Original of Monarchies', **(3)** and **(4)**, must be dated as written between March 1702 and August 1714, and equally so other draft versions that mention 28 kings of England. That is, the pages on which these calculations appear, and, most likely, the surrounding pages. It is clear that the scribal copy **(6)**, which also has 28 kings, must have been written before August 1714 and thus cannot have been meant as a presentation copy for Caroline, as Westfall suggested. As the early draft for the *Chronology* shows, in which Newton overwrote 28 with 29, sometime before August 1714 Newton started rewriting the first chapter of the 'Originals', which would evolve into the long first chapter of the *Chronology*. Since the 'Original of Religions' was part of the older Keynes/Yahuda 'Originals' **(3)**, it too must have been composed after 1702 and before 1714, at least a decade later than traditionally assumed.

In fact, it is possible to narrow down the window of composition of the 'Originals' much further, because there are other sections in Newton chronological writings that can be dated. These involve the astronomical data he employed to calculate the Argonautic expedition. Most these he took from Hevelius' *Prodromus* (1679), whose data related to the epoch 1660, and the epoch 1689–90 materials from John Flamsteed, which he acquired in 1705.[366] According to

[365] CUL Ms. Add. 3988, fol. 15^{r}; CUL Ms. Add. 3987, fol. 16^{r}, still has 29 kings. Buchwald and Feingold state that in 1702 (their date for the Keynes 'Original of Monarchies') Newton 'did not consider Oliver Cromwell as a ruler. His final list of English kings attests to his continual struggle with the issue. He jotted down Cromwell's name, only to remove it from his final calculation', but they provide no source for this; see *Orig. of Civ.*, 195 n.1. I can only suppose they refer to a remark – in Thomas Pellet's hand? – on a damaged folio, once used as a wrapper containing 'Loose papers related to the Chronology' which reads that '[i]In one there is a computation [of] the reigns in England for w[^{ch}] he reckons - Cromwell's…', NCL Ms. 361.2, fol. 4^{r}. No such computation can be found in the manuscript, suggesting that the loose sheets and reused letters now in Yahuda 7.3o were once bound together with these materials.

[366] *Orig. of Civ.*, 272.

Newton, the sphere had been created for the use of the Argonauts, a pivotal assumption that allowed him to date the expedition and thus provide an anchor point for his chronology: '[A]s Chiron & Musaeus formed the Asterisms & delineated them upon the globe for the use of the Argonauts, so Palamedes reformed the globe & delineated set the stars upon it more exactly for the use of the Greeks in their expedition against Troy, & did it in such manner that the middle of the cardinal signes might fall upon the solstices & Equinoxes observed by himself.'[367] In the relevant chapters from the 'Originals', **(7-III)** and **(8-III)**, Newton invariably used Hevelius' 1660 data.

However, in the *Short Chronicle*, written in 1717, Newton refrained from mentioning any astronomical data and only included the results of his calculations.[368] By then, he had realized that Flamsteed's data yielded different results from Hevelius'. In **(8-III)**, Newton had calculated that the Trojan War had happened in around 920 BCE, which would place the Argonautic Expedition in around 952 BCE, much later than the date of 1209 BCE calculated by Selden or 1226 BCE calculated by Petavius.[369] In the *Short Chronicle*, Newton provided even earlier dates, 904 and 937 BCE, for these events, based on Flamsteed's data as his calculations in the *Chronology* show. In a draft for the passage as it would appear in the *Chronology*, Newton first drew up a paragraph using Hevelius' 1660 data, immediately followed by a version of the same paragraph but with Flamsteed's 1689–90 data.[370] It might be that he started using Flamsteed's data for the first time when writing this passage; from the earlier discussion about the kings of England it is clear that he began converting his materials from the 'Originals' before March 1714.[371] At one point in his writing, Newton reused a draft folio for *Optice*, the Latin version of *Opticks*, published in 1706, where he still used only the 1660 data, suggesting

[367] Yahuda Ms. 25.2d, fol. 7[r]. In the *Chronology*, Newton would forego Palamedes, the son of one of the Argonauts, and attribute the invention of the sphere and the asterisms solely to Chiron and Musaeus. See also *Historian*, 81-8; *Orig. of Civ.*, 247 n. 6.
[368] *Chronology*, 25.
[369] J. Selden, *Marmora Arundelliana, sive Saxa Graeca incisa* (London, 1629), 95; Petavius, *Rationarium Temporum*, 36-40.
[370] NCL Ms. 361.2, fol. 7[r].
[371] See also *Orig. of Civ*, 448.

that around that time he had not yet studied Flamsteed's data.[372] As the passage contains a draft for **(7-III)**, this chapter and the worked-out version in **(8-III)** must be dated to 1706. Had he been working on these chapters sometime after 1706, he would have certainly included Flamsteed's 1689–90 observations. Thus, I suggest that all of the 'Origines' materials were written between 1702 and 1706, with the possible exception of the fragments that comprise **(1)**.

3.5.4 When Kings were Priests

The identification of the 'Original of Religions' and the 'Original of Monarchies' as part of the same work has far-reaching consequences. It clearly shows that Newton did not change course, from a comparative theological study of the four generations after the Flood to a chronological discourse on the major monarchies, but that these two topics remained both intellectually and physically connected in his writings. Included with the materials for the 'Original of Religions', there is in fact a setup for a chapter titled 'The history of the first Ages', where Newton returned to the materials from the *Theologiae Gentiles* 'Origines' *Philosophicae*, including his struggle with defining the quintessence. It is a connection I will explore in more detail in Chapter 4. The 'Originals', then, shows the same dual nature as the 'Origines', containing both theological and chronological elements. The 'Origines' reflects Newton's search for the cause of idolatry, which he firmly located in ancient Egypt. Here, the original religion of Noah and his sons had been perverted; instead of worshipping the maker of heaven and earth, the Egyptians began to worship the bodies of heaven – the sun and moon, the planets, the stars – and the bodies of earth – Noah and his descendants – under the names of Saturn, Jupiter, and others. From Egypt, this religion spread all over the world, as Newton proved by tracing back the origins of their ancestors, now worshipped as gods, to their Egyptian roots. Although he never anchored Noah's days to exact dates, it would necessarily imply that the kingdom of Egypt had risen during or soon after Noah's days, and

[372] NCL 361.2, fol. 146^{r}.

likewise all other monarchies, who shared the same origins story. This meant that shortly after the Flood, none of these kingdoms could have had any meaningful size.

In the chapter titled 'Original of Monarchies', then, Newton set out to prove that all kingdoms of the world had originally been small city states, drawing upon both Scripture and pagan authors. Kings were local leaders, hardly worthy of the term king, and often the people of the city would rule themselves, as in Athens or Attica, consulting in their *prytaneum* as he related from Thucydides and Plutarch. It was only after the times of Moses that these kingdoms 'by conquering one another grew bigger & bigger till the rise of the four Monarchies.'[373] In the Keynes 'Original of Monarchies', in a passage that would become a staple of the *Chronology*, Newton set out to deal with what he saw as the inflated antiquities of all of these kingdoms: 'Now all nations before they began to keep exact accompts of time have been prone to raise their antiquities & make the lives of their first fathers longer then they really were.' This contention did not pertain to the heathen peoples only, as he continued 'And ~~in imitation of the Egyptians~~ the seventy have added to the ages of the Patriarchs', referring to the legendary editors of the Septuagint, the Greek translation of the Hebrew Bible, a line which he would remove later.[374] To battle these historical aberrations and keep within the limits of sacred chronology, he added his calculations on the average reigns of kings, including those of the kings of England I discussed above.

By the time of **(5)**, the Keynes 'Original of Monarchies' was followed by two chapters on the Egyptian kingdoms at Thebes and Memphis. In its final lines, Newton wrote: 'We have shewn how the cities of Egypt united very early ~~into~~ into small kingdoms, & how those kingdoms grew at length into one Monarchy seated \first/ at Thebes \& then at Memphys/ remains now to be explained.'[375] However, the preceding Keynes/Yahuda version **(4)** instead returned to its religion. Quoting from Strabo and Lucian, Newton discussed how the Egyptians worshipped

[373] Keynes Ms. 146, fol. 3^{r}.
[374] Ibid., fol. 14^{r}.
[375] Ibid., fol. 26^{r}.

animals, but that 'the birds beasts & fishes w^{ch} they worshipped were nothing else then the ~~symbols~~ Hieroglyphicks symbols or banners of their first kings,' and he added that their worship must have predated Moses because it was 'described & prohibited in the second commandment', which he subsequently quoted in full.[376] As this worship was clearly related to the reverence of ancestors, this was again proof of how Egypt had been the root of all evil: 'The worshipping of such Kings gave a beginning to ~~Astrology~~ Idolatry in Egypt Chaldea & the neighbouring nations from whom it spread into Europe & other places. And the multitude of cities in Egypt which had their several Temples, Gods, Conventions, High Priests & modes of worship argues the multitude of kingdoms & nations in Egypt when idolatry began.'[377] Following a general explanation of how the cities of Egypt grew into kingdoms, and how this process predated that of Greece, at the end of the chapter Newton returned to the *prytaneum*. Here he explicitly detailed the relation between the Egyptian monarchies and their religion: '[As] the Prytanea in the several cities of Greece were the remains of ancient kingdoms, so were the temples conventions & religions in Egypt... These capital cities with \their/ Prytaneums & Conventions seem to have laid the foundation of the Nomes or ~~Tales~~ \nations/ of Egypt, every Nome having a capital city with a Temple & Priest & God & annual conventions for the whole Nome… so that the Nomes ~~were~~ \seem to be/ the remains of ancient kingdoms the Priests of the capital cities retaining their Priesthood ~~& judicial power~~ long after they lost their armies & power as kings. For in the first ages all Kings were high Priests & Judges, [& all high Priests were Kings…]'[378] In the manuscript, there is a clear difference in handwriting and especially line and word spacing between this paragraph and the preceding text. From this, it appears that the entire section about the *prytanea*, and the relation between these temples and the Egyptian monarchies, is a later addition, meant to replace the 'Original of Religions' chapter.

[376] Yahuda Ms. 25.2f, fol. 48^{r}.
[377] Ibid., fol. 49^{r}.
[378] Ibid., fols. 49^{r}-50^{r}. As the square brackets show, Newton was in two minds about the high priesthood of the Egyptian priests; not surprisingly, as it would set them on the same footing as Jesus; see Heb. 6-7.

With the placement of the 'Original of Religions' alongside the 'Original of Monarchies' and the reconstruction of their evolution, much of what modern scholars have said about these chapters is no longer valid. For example, throughout the various versions of the 'Original of Monarchies', Newton discussed and questioned the trustworthiness of ancient sources like the writings of Manetho or the Parian Marble. Historians have expressed surprise that Newton did not take on Sanchuniathon, whose authority he invoked in the 'Original of Religions' but no longer considered reliable when he started drafting the *Chronology*.[379] It is now clear that at the time of writing the 'Original of Monarchies', he was still relying on Sanchuniathon, to whom he also frequently referred in the chapter on Egypt associated with the 'Original of Religions' **(2-III)** and in the chapters on the monarchy of Egypt at Thebes in **(5-III)** and **(7/8-VII)**.[380] It was only after 1706 that Newton gave up on the Phoenician historian and paid more credit to Herodotus.

Likewise, any suggestions about the *Theologiae Gentiles* 'Origines' *Philosophicae* and the 'Original of Religions' as two closely connected stages of the same project must be discarded: they were composed about fifteen years apart, one as an independent treatise, the other as part of a much larger narrative. From unravelling the New College 'Original of Monarchies', it is now clear that only the first three folios belong to the eponymous chapter, and that these were written before the Keynes version. Yet historians have invariably based their comparisons of the versions on the reverse order – first Keynes, then New College – from the 29 kings calculation found further down in the New College manuscript, which is a completely unrelated fragment. Thus, when Newton included a line in the New College version that 'the fathers of families should assemble & consult together for y^{e} common good of their families & agree upon such laws as should be common to them all & appoint a common Judge to judge between family & family according to those laws', Buchwald and Feingold consider that Newton was refining the narrative from the Keynes 'Original', where the line is absent.

[379] *Orig. of Civ*, 200, 222.

[380] Yahuda Mss. 25.1f, fol. 2^{r}; 25.2a, fol. 26^{r}; 41, fol. 14^{r} ff; 25.2b, fols. 11^{r} ff. See also NCL Ms. 361.3, fols. 187^{r} ff.

However, Newton had in fact rewritten the passage, which in the Keynes version read 'the fathers of families became y^{e} elders of the city composing a Council with y^{e} same legislative & judicial power over the whole body of all their families w^{ch} every father had before over his own apart…'[381] Obviously, the literature on Newton's historical and chronological researches contains many similar inferences based upon an incorrect ordering and dating of the manuscripts, all of which will have to be revised.

3.6 Conclusion

In this chapter, I have explored how Newton ordered his materials, and reconstructed the chronology of his writings up until the first drafts for what would become the *Chronology of Ancient Kingdoms Amended*. I have shown how Newton employed various ordering mechanisms to keep track of the plethora of paragraphs and chapters he was working on, and how his editorial interventions inform us about his intellectual considerations. It is clear that most of the current manuscript structure is highly artificial and the combined result of Newton's own reordering practices and the interference of later editors. His earliest chronological treatise, the *Theologiae Gentiles* 'Origines' *Philosophicae*, composed during the mid-to-late 1680s, shows a complex editorial history. In four phases, Newton first focussed on the Egyptian origins of idolatry through star worship, which he subsequently expanded to show that all Mediterranean religions had derived from Noah and his progeny. He then transformed his project into the 'Originals', which he started working on in the mid-1690s – in Latin – but which only fully came to fruition between 1702 and 1706. With the 'Originals', at least eight phases can be reconstructed based on the manuscript evidence, several of which at one point contained both the 'Original of Religions' and the 'Original of Monarchies'. Of the latter chapter, the New College version traditionally dated as 1 August 1714 or later is in fact older than the Keynes version. In the earlier phases of the 'Originals', Newton still focused on Egypt as the

[381] NCL Ms. 361.1, fol. 93^{v}; Keynes Ms. 146, fol. 2^{r}; *Orig. of Civ*., 195.

origin of religion and civilization. In the later, transitional phases, Newton expanded the chapters on ancient Greece and introduced the astronomical calculations for the Fall of Troy and the Argonautic Expedition that would become the backbone of the *Chronology of Ancient Kingdoms Amended*.

One of the more surprising results of this reconstruction is the clear continuity between the 'Origines' and the 'Originals', which show the same connection between religious and political history, as exemplified by Newton's use of the *prytaneum*. The 'original' of religions and that of kingdoms were two sides of the same coin, with magistrates fulfilling the dual role of priest and king. But there is another connection that has so far remained unexplored. In both the 'Origines' and the 'Originals', Newton made use of the framework of the Four Monarchies from the book of Daniel. Yet apart from the odd casual mention, the histories of the monarchies involved – Assyria, Babylonia, Persia, Media, the Empire of Alexander the Great and the Roman Empire – do not return in the 'Originals'. In the *Chronology* and the related drafts, Newton devoted entire chapters to the Assyrians, Babylonians, Persians and Medes, in shifting configurations. Likewise, key moments in the history of these empires appeared in the timeline that he wrote up for the *Short Chronicle* in 1717. Lest we assume that Newton only started working on the chronology of these monarchies after the final version of the 'Originals', there are ample materials among the manuscripts that deal with the kings that ruled over Babylon during the Jewish exile that seem to predate even the 'Origines'. Yet none of these materials were ever part of the 'Origines' or the 'Originals'. It appears that until about 1714, these histories were contained in a different project, his studies of the prophecies in Scripture. In the next chapter, I will discuss how these chapters emerged, and how Newton integrated his chronological and prophetical studies.

4. Sacred Chronology

4.1 Introduction

After composing the 'Originals' and the *Short Chronicle*, Newton continued working on his reconstruction of ancient chronology. Now in his seventies, he still displayed a tremendous energy and zeal when it came to writing. With the help of various assistants, he published a second, expanded edition of *Opticks*, and was working towards a third edition of the *Principia*, when in the fall of 1725 he received an unpleasant surprise in the form of the *Abregé*. As I have shown in Chapter 1, Newton's response was short and to the point. In his eyes, the French translation of the *Short Chronicle* contained many errors, and showed an even greater misunderstanding of its key arguments. It is unclear whether he considered publication of his revised chronology before writing his rebuttal, but from that moment onward he frantically began drafting up chapter after chapter of materials that would eventually become the *Chronology of Ancient Kingdoms Amended*.

The posthumously published *Chronology* consisted of six chapters of variable length, preceded by the *Short Chronicle*. The first chapter alone, titled 'Of the Chronology of the First Ages of the Greeks', took up almost half of the 376-page volume and contained most of the materials found in the final versions of the 'Originals'. After a brief introduction, Newton immediately introduced his calculations for the average lengths of kings' reigns, followed by an analysis of ancient calendars and his arguments for dating based on astronomy. Having thus anchored Greek history, in the remainder of the chapter and in Chapters 2, 3, 4, and 6, Newton worked out his revised chronology for the various Greek kingdoms, those of Egypt – collected in a single chapter – Assyria, the contemporary empires of the Babylonians and Medes, and, in the final chapter, the Persians. Chapter 5, which only emerged from his drafts at the very last moment, dealt with a seemingly wholly different matter: the Temple of Solomon.

In an early draft for what was then still a combined chapter on the empires of the Medes and Persians, Newton began with a concise overview of the various kings who reigned before Cyrus the Great conquered Babylon in 538 BCE. Drawing on Ptolemy's *Canon* and ancient historians such as Xenophon, Pliny, Herodotus, and the ever-present Eusebius, Newton provided a rough timeline of the period up to Cyrus' days, when 'this kingdom was arrived to its greatness.' What followed was a description of Persia and Media taken not from history, but from prophecy:

> Daniel represents this kingdom by the silver breast & arms of the Image the two arms denoting Media. He represents it also by a Bear which raised it self up on one side: the kingdom of Persia rising up after that of Media. The three ribs which this Bear held in his mouth are Sardes Babylon & Memphys the three strong imperial cities of the Kingdoms of the Lydians Assyrians & Egyptians. He holds them in his mouth between his teeth as if he were eating them to signify that they are conquered nations distinct from his own original body. & he is bid to arise & eat much flesh to signify the largeness of his conquests & of the riches he should draw from them.[382]

Anyone in Newton's days would have immediately understood the reference, its context, and its wider implications. Daniel's words pertained to the rise and fall of four monarchies, which in the works of various ancient and contemporary commentators included those of Assyria, Babylon, the Medes and Persians, the Greek or Macedonian Empire of Alexander the Great, and the Roman Empire. Closely connected with the prophecies found in the book of Revelation or the Apocalypse, parts of Daniel's text were also understood to depict the second coming of Christ and the Day of Judgment. As I have shown in Chapter 1, historical discussions of these empires were thus invariably connected with their role in the economy of salvation. Moreover, through the concept of *translatio imperii*, the fourth monarchy lived on as the Holy Roman Empire, with the Pope at its head, a person considered by most Protestants to be the Antichrist prophesied in Scripture.

[382] NCL Ms. 361.3, fols. 112A^{r-v}, normalised.

For Newton too, chronology, church history, and the interpretation of Scriptural prophecy were much more closely connected than is apparent at first glance. As I will show in this chapter, passages, paragraphs, and in fact entire chapters were moved and transformed between the different projects on which he was working. Historians of Newton's scholarly work have discussed these topics primarily in isolation, triggered by modern disciplinary categorization, the fragmentary state of the manuscripts, the separate posthumous publication of the chronological and prophetical materials, and, indeed, Newton's own ordering and reordering practices. A superficial reading of the *Chronology of Ancient Kingdoms Amended* shows no immediate connections with his studies of the prophecies, yet they are present. Moreover, evaluating Newton's chronological studies solely on the basis of the posthumously published *Chronology* fails to take into account that the choice of manuscript was never his, as he passed away while the work was still in progress. Indeed, the manuscript from which the book was printed differed significantly from all the preliminary drafts. No, in order to understand Newton's chronological writings and their purpose, one needs to dig a little deeper.

In this chapter, I examine Newton's studies of the prophecies, and the strategies he developed to decipher their symbolism. To be able to correctly identify the kingdoms and kings mentioned in Scripture, in particular in the books of Daniel, Ezra, and Nehemiah, Newton needed a reliable timeline. In the second half of this chapter, I explore how he established the distinction between what he considered fact from fiction, and the various chronological problems he had to solve. Having established from Greek and Latin sources the lineage of kings that ruled over Babylon before, during, and after the Jewish Exile, I explain how Newton attempted to harmonize his genealogy with the record found in Scripture. I show how he initially clung to traditional interpretations that preserved the order of events recorded in Ezra and Nehemiah, but soon resorted to a highly text-critical approach. I subsequently explore the intrinsic connections between Newton's chronological and prophetical studies, and show how he firmly believed that *all* four monarchies, and not just the Roman Empire, were still present, and had their role to play in the end times.

4.2 Newton and prophecy

Newton pursued the study of the prophecies with religious zeal. It was the duty of every Christian to study the Scriptures, for God revealed Himself and his plans with the world through his Word. If the Jews had paid heed to the prophets in their days, they would not have failed to recognize Jesus as the Messiah they had been expecting for so long.[383] Obviously, the prophecies with their obscure language were not easy to understand, which made diligent study of these words even more relevant. As he explained in an early treatise, Jesus spoke to the Jews in a similar fashion, through parables; and so 'y^{e} mystical scriptures were written to try us.' Alas, the Jews heard Jesus' words and saw the miracles he performed, but while hearing and seeing they did not understand. Therefore, Newton added, 'beware that thou be not found wanting in this tryall.'[384] At the same time, after His resurrection, Christ revealed himself to his disciples and explained from the prophecies in Scripture that he had to suffer and die, and would rise again. According to Newton, this showed that the prophecies concerning Christ were given to the early Church for their conversion, and for the establishment of the faith. Therefore, as he put it, '...if it was their duty to search diligently into those Prophesies: why should we not think that the Prophesies w^{ch} concern the latter times into w^{ch} we are fallen were in like manner intended for our use that in the midst of Apostacies we might be able to discern the truth & be established in the faith thereof, & consequently that it is also our duty to search with all diligence into these Prophesies.'[385] As Newton saw it, the study of the prophecies in Scripture was not to be taken lightly, but a matter of utmost importance, a sacred duty, and not just for learned men.

[383] Yahuda Ms. 1.1, fols. 2^{r}-3^{r}; *Priest*, 233-4; Goldish, *Judaism*, 66-67.
[384] Yahuda Ms. 1.1, fol. 2^{v}.
[385] Ibid., fols. 2^{r}-3^{r}.

4.2.1 Providing guidance

Like many of his contemporaries, Newton did not consider the Apocalypse as an event sometime in the far future; indeed, he believed he was living in the end times. The 'latter times' he mentioned were a direct reference to various passages in Scriptures where Jesus talked about his return.[386] As the letters from Paul, Peter, James, and John, and the book of Revelation testified, these would be times of great tribulation for the faithful. In another passage, Newton admonished his audience, in language reminiscent of the Puritan sermons he had heard as a child:

> Consider also the designe of the Apocalyps. Was it not given for y^{e} use of the Church to guide & direct her in the right way, and is not this the end of all prophetick Scripture? If there was no need of it, or if it cannot be understood, then why did God give it? Does he trifle? But if it was necessary for the Church then why doest thou neglect it, or how knowest thou that thou art in the right way, and yet doest not understand it?[387]

Indeed, Newton thought it 'a duty of the greatest moment' that men – *all* men – should earnestly study the prophecies, and not just the learned. However, without guidance, these prophecies were rather difficult to understand. Thus, Newton added, 'such a guide I hope this \Book/ will prove,' supposing the reader would accept the interpretive rules he provided.[388]

It is not entirely clear when Newton wrote these lines – sometime between the early 1670s and 1690s – but the ominous events of the decades before would have been fresh in his memory. We do not have any autobiographical notes by Newton from the fateful year of 1666 referring directly to the plague, or the Great Fire, but its numerical significance would not have escaped him. Nor would he have been surprised with the interpretations of the Fifth Monarchists or James Janeway, which I discussed in the first chapter, for these echoed the

[386] See e.g. R.W. Cogley, 'Seventeenth Century English Millenarianism', *Religion*, 17 (1987), 379-96, esp. 390-91.
[387] Yahuda Ms. 1.1, fol. 4^{r}.
[388] Ibid., fols. 7^{r}-8^{r}. See also Mandelbrote, 'Newton and Biblical criticism', 281-302.

ideology and language he had been brought up with. In his religious biography of Newton, Rob Iliffe sketches a vivid picture of Newton's upbringing in the parish of Colsterworth, with the Civil War raging at his doorstep.[389] As a young boy, he would have had to take notes on the Bible and instructional texts, as well as on the sermons he regularly attended and whose contents he was supposed to memorize. He would on occasion have heard the Puritan minister Francis (or Frances) Browne deliver his homilies in Colsterworth; in Grantham, where he went to Grammar School, he was instructed by Henry Stokes, another staunch Puritan.[390] At the same time, there were other divines in Newton's immediate surroundings, in particular his uncle William Ayscough, and Humphrey Babington, later Fellow at Trinity College, Cambridge, whom he knew from his grammar school days in Grantham, all Anglicans.[391] Although we do not have full details about Newton's religious upbringing, we do have the results. Newton's famous list of sins, drawn up in shorthand to provide some protection from peeping eyes, shows several trespasses that only a Puritan boy would worry about: 'Eating an apple at Thy house…. Caring for worldly things more than God… Idle discourse on Thy day and at other times… Neglecting to pray…'[392] The latter item was added to a list of sins committed after Whitsunday 1662, showing how for a short period the nineteen-year old continued to keep track of his transgressions. It would not take long before the comets appeared in the sky, and thus it does not seem too farfetched to assume that Newton read the signs of the times in similar Puritan fashion.

None of this sentiment ever returned in his religious writings, although there are clear Puritan traces. When required to deliver a sermon in Trinity College chapel in the late 1670s, he chose for his topic a passage from the second book of Kings that dealt with King Jeroboam's

[389] *Priest*, 34-35, 43-45.
[390] Ibid., 41. See also K.A. Baird, 'Some influences upon the young Isaac Newton', *NRRS*, 41 (1987), 169-79, esp. 173.
[391] *Priest*, 32-4; Baird, 'Influences', 173-75.
[392] Fitzwilliam Notebook, fols. 3^{r}-4^{v}; Iliffe, in *Priest*, 44, also emphasizes the Sabbatarian – and hence Puritan – nature of several entries, i.e. those referring to 'Thy Day'. On Puritans and the sabbath, see also A. Walsham, *Providence in Early Modern England* (Oxford: 2001), 68-115; B. Capp, *England's Culture Wars: Puritan Reformation and its Enemies in the Interregnum, 1649-1660* (Oxford, 2012), 100-09.

instigation of idol worship through the images of two golden calves.[393] Those calves were obviously reminiscent of the golden calf the people of Israel worshipped in the desert, shortly after the Lord had led them out of Egypt. Throughout sacred history, the Exodus had been read as a salvation episode, as a rebirth of the people of Israel with God freeing his people from the tyranny of slavery, through the Red Sea, and to the Promised Land. That same episode was seen as symbolic for the salvation of the Christian through the redemptive work of Christ. Likewise, Egypt was synonymous with evil, with decay, with death. It was impossible for Newton's audience to read these lines and hear his sermon and not draw lines with their own lives, including when it came to idol-worship.[394] What *did* remain from his Puritan upbringing was an emphasis on serious study of the Scriptures, and a strong belief that these were the 'latter days' in which parts of the prophecies in Revelation had been fulfilled already, and others were about to become reality.

4.2.2 Interpreting images

Just as with the chronological materials, Newton left behind thousands of draft pages related to his studies of the prophecies in Scripture, including lists of notes, drafts for paragraphs, chapters, and entire treatises. At one point, he sat down with his Bible and recorded every single verse of the Old Testament that dealt directly or indirectly with Christ's first or second coming.[395] In his chronological research, Newton used genealogical trees; in his study of the prophets, his schematics included large tables where he mapped various passages from the book of Revelation onto each other and onto a historical timeline.[396] In recent years, Newton's reading of the Apocalypse and the methods he employed have received serious scholarly

[393] Yahuda Ms. 21, fol. 1^{r}, Newton's words, differing from the KJV in the passage 'y^{e} Lord had said', where the KJV reads 'y^{e} Lord had charged them'. There are two other manuscripts dealing with the same passage. HRHRC Ms. 130 seems intended as a draft for a follow-up, referring to a 'former... occasion to dis[c]ourse of these words' and summing up the earlier sermon. Babson Ms. 437 seems a draft for Yahuda Ms. 21. See also *Priest*, 138-40.
[394] Yahuda Ms. 21, fol.14^{r}.
[395] See ASC Ms. N47 HER, fols. 1-32.
[396] See *Priest*, plates 17 and 18.

attention.[397] As Iliffe and others have shown, Newton created a substantial systematic interpretative framework which to a large extent drew upon the work of Joseph Mede, in particular his synchronisms. Mede understood several passages from the book of Revelation to refer to one and the same event, using different imagery. This also meant that the order in which the visions were presented by the book's author, John the Apostle, did not necessarily imply their temporal sequence. Newton took Mede's ideas much further and insisted that two entire series of prophecies, the first concerning seven vials, the second seven trumpets, were in fact congruent and described the same events twice, and could thus be synchronised. One other important aspect in which Newton's interpretation differed from that of Mede, and others, most notably Henry More, was the length of the time period between the so called 'Great Apostasy' and Christ's second coming. In the latter days there would be many false teachers professing perverted forms of the original, true, religion that Christ had come to restore. In the first letter of Paul to the Thessalonians, the apostle warned the Christians gathered there to '[l]et no man deceive you by any means: for [the] day [of Christ] shall not come, except there come a falling away first, and that man of sin be revealed, the son of perdition. Who opposeth and exalteth himself above all that is called God, or that is worshipped.'[398] The 'son of perdition', Antichrist, would be revealed before Christ's second coming, but alas, not all would recognize him. As Paul's warning continued, many would follow Antichrist in this 'Great Apostasy', which most Protestants believed referred to the Roman Catholic Church, with either the Church or the Papacy being Antichrist.[399]

Newton situated the Great Apostasy in the fourth century, several decades earlier than More and Mede. Whereas they focussed on various religio-political events, in particular the division of the Roman Empire after the death of Theodosius the Great in 395, Newton firmly put key-

[397] See Hutton, 'More, Newton, and the language of Biblical prophecy'; id., 'Seven Trumpets'; Iliffe, 'Making a Shew'; id., 'The Religion of Isaac Newton', in *CCtN*[2], 494-501; *Priest*, 219-59; M. Murrin, 'Newton's Apocalypse', in *CNI*, 203-20; M. Mamiani, 'Newton on prophecy and the Apocalypse', in *CCtN*, 387-408; P. Greenham, 'A Concord of Alchemy with Theology: Isaac Newton's Hermeneutics of the Symbolic Texts of Chymistry and Biblical Prophecy' (University of Toronto, diss., 2015), 127-49.
[398] 2 Thess. 2:3-4, KJV.
[399] For exceptions, see *Priest*, 229.

episodes from the introduction of the Trinitarian heresy at its core.[400] Both More and Mede added a period of 1,260 years to their calculations of the time of the Great Apostasy, a figure found in Daniel and Revelations, to arrive at key dates for the Day of Judgement in the immediate future.[401] This was partially based on their interpretation of the Reformation and the emergence of the Church of England as pivotal events corresponding with key prophecies. But Newton interpreted these prophecies in a different way, which necessitated a much longer period between the fourth century and Christ's return, as I will show below. In his notes, he eventually wrote down that the Day of Judgement would not come 'before 2060', but that date, or any other for that matter, did not return in any of the materials that were published in 1733.[402]

In order to correctly understand the prophecies, Newton had developed a systematic method, alternatively titled 'Rules for interpreting y^{e} words & language in Scripture' and 'Rules for methodising | construing the Apocalyps'.[403] Set up in axiomatic fashion, he first provided a series of methodological principles, such as '[t]o keep \as/ close \as may be/ to the same sense of words, especially in the same vision… [t]o ~~prefer~~ \chose/ those interpretations w^{ch} are most according to y^{e} litterall meaning of y^{e} scriptures unles where the tenour & circumstances of y^{e} place plainly require an Allegory… [t]o choose those constructions which without straining reduce contemporary visions to the greatest harmony of their parts', and [t]o choose those constructions which without straining reduce things to the greatest simplicity,' each followed

[400] *Priest*, 249, 269-73; R. Iliffe, 'Prosecuting Athanasius: Protestant forensics and the mirrors of persecution', in J.E. Force and S. Hutton (eds.), *Newton and Newtonianism: New Studies* (Dordrecht, 2004), 113-54; id., 'Religion of Isaac Newton', 495-96.
[401] *Priest*, 266.
[402] Yahuda Mss. 7.3g, fol. 13^{r-v}, and 7.3o, fol. 8^{r}. See also R. Delgado-Moreira, 'Newton's treatise on Revelation: The use of a mathematical discourse', *Historical research*, 79 (2006), 224-46; S. Mandelbrote, 'Isaac Newton and the exegesis of the book of Daniel', in Bracht and Du Toit, *Geschichte der Daniel-Auslegung*, 351-75, esp. 355; S.D. Snobelen, 'Isaac Newton, heretic: the strategies of a Nicodemite', *BJHS*, 32 (1999), 381-419, esp. 391-93; id., ''A Time and Times and the Dividing of Time': Isaac Newton, the Apocalypse and 2060 A.D.', *Canadian Journal of History / Annales Canadiennes d'Histoire*, 38 (2003), 2-13.
[403] Yahuda Ms. 1.1, fol. 12^{r}. See also Iliffe, 'Making a Shew', 63-68; Mandelbrote, 'Exegesis', 363-64; S.D. Snobelen, 'Not in the language of Astronomers': Isaac Newton, the Scriptures, and the Hermeneutics of Accommodation', in J. M. van der Meer and S. Mandelbrote (eds.), *Nature and Scripture in the Abrahamic Religions: Up to 1700* (Leiden, 2008), 491-530.

by short examples. These principles closely resemble his 'Rules for Reasoning' from in Book 3 of the *Principia*, the first and second of which state that 'No more causes of natural things should be admitted than are both true and sufficient to explain their phenomena' and '[t]he causes assigned to natural effects of the same kind must be, so far as possible, the same.'[404] What followed were several postulates, which Newton initially called 'Definitions', before he relabelled them more appropriately 'Prophetic figures'. Far from definitions, these prophetic figures took the form of conjectural statements, following the rules he had outlined earlier: '...the Sun signifies y^{e} ~~supreme~~ King \and Kingly power/… a Mountain signifies a city & more especially the head City as Jerusalem or Babylon… Earthquakes wars & commotions…' Although, as Newton stated, 'these interpretations… may seem plain enough,' he continued by providing evidence from various places in Scripture under the heading 'The Proof'.[405]

With regards to the visions from Daniel, which included four wild animals, Newton wrote:

> Wild beasts… by reason of their feeding upon vegetables, & preying upon one another signify Kingdoms of the Earth with their armies. A particular Beast, as in Daniels prophesies, signifies a particular kingdom, & Beasts in general kingdoms in general. Come ye, assemble all the Beasts of the feild, come to devour. Chal. Paraphr. Those that slay with the sword shall be assembled from all sides: Kings of nations & their armies shall come to spoile. Ier 12.9.[406]

The abbreviation 'Chal. Paraphr.' here referred to the Aramaic Targum of Jonathan ben Uzziel, the 'Chaldaean Paraphrast', substantiating his identification with both Jewish oral tradition and Scripture. Having established the correct interpretation of large animals in prophecy, he then uses this to derive the meaning of the dragon as it appeared in the book of Revelation:

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[404] 'Causas rerum naturalium non plures admitti debere, quam quae & verae sint & earum Phaenomenis explicandis sufficiant… Effectum naturalium ejusdem generis eaedem sunt causae.' I. Newton, *Philosophiae Natural Principia Mathematica* (London, 1687), 402; trans. Cohen and Whitman, *Principia*, 795-6; in the first edition, Newton used the term 'hypotheses' instead of 'rules', as he would do in the second and third edition.

[405] Yahuda Ms. 1.1., fols. 20^{r}, 28^{r},

[406] Ibid., fol. 33^{r}.

> Among the Beasts that represent Kingdoms I reccon the Dragon one. A Dragon signifies the person of a hostile King & serpents according to their bigness the persons of other greater or lesser enemies. If a Dragon appeare to a King in a dream, he shall be troubled with the rumor of another King. If any one happen upon a very great golden Dragon adorned on his back with scales as it were of Iewels, & make him his own: he shal obtein a Kingdom & dominion over the people. Achm. c. 288 ex Ind. Pers. Ægypt. According to this Doctrine the Apocalyptic Dragon is a very proper emblem as well of the Roman Emperors & Empire which was so great an enemy to the church as of the Devil that arch-enemy to mankind.[407]

The underlined passage is a quote Newton took from Mede, who referred to *Achmetis Oneirocritis*, the Dream Book of Achmet, an unidentified Arab scholar reporting on inscriptions found on ancient Indian, Persian, and Egyptian monuments.[408] Using the rules and definitions he outlined in his scheme, Newton began to systematically interpret the prophecies in Scripture.[409] The beasts from Daniel prophecies to which he referred to above, where of course those from the vision of the four animals. Newton considered that they were in fact the same prophecy, given in different forms, and with subtle differences, following various ancient interpreters including Jerome.[410]

As he wrote in the materials that were published posthumously as *Observations upon the Prophecies of Daniel and the Apocalypse of St John* (1733), the four empires represented by the parts of the statue were that of Babylon, of the Persians and the Medes, the Greeks under Alexander the Great, and the Romans. In his interpretation of the four animals, Newton put it slightly differently: the first monarchy, the two-winged lion, represented the empires of the Babylonians and Medes, who together conquered the Assyrian empire. Then followed the Persians, the Greeks, and the Roman Empire. This discrepancy might be explained by noting

[407] Ibid., fol. 38^{r}.
[408] *Priest*, 224-40; K.L. Haugen, 'Apocalypse (A User's Manual): Joseph Mede, the Interpretation of Prophecy, and the Dream Book of Achmet', *Seventeenth Century*, 25 (2010), 215-39, esp. 216-22.
[409] *Priest*, 219-314.
[410] See Jerome, *Commentary on Daniel*, 73 and *passim*.

that the *Observations* was never Newton's making, but that of a collective of editors who inspected Newton's papers after his death and collated what they considered a coherent treatise from the available drafts, as I discuss in Chapter 5. Just like the chapters for the *Chronology*, all of this was still work in progress. Both of these projects show how Newton was still not entirely sure about the exact configuration of the first and second empire.

During the reign of Theodosius the Great, the Roman Empire broke into ten smaller kingdoms, the ten horns, which Newton subsequently listed, drawing upon Orosius. He devoted ample attention to the eleventh horn, the little horn which replaced three of the ten horns, had eyes, and spoke great things, which he interpreted as a small kingdom that had come forth from the Latin or Roman Empire. However, he continued, 'it was a kingdom of a different kind from the other ten kingdoms, having a life or soul peculiar to itself, with eyes and a mouth. By its eyes it was a Seer; and by its mouth speaking great things and changing times and laws, it was a Prophet as well as a King. And such a Seer, a Prophet and a King, is the Church of Rome.' Newton arrived at this conclusion by arguing that the Greek word for seer was the exact same word as that for bishop, Ἐπίσκοπος, and that the see of Rome had claimed the universal Bishoprick, just as the little horn ruled over the other Roman horns. In fact, just as the little horn had uprooted three other horns, so had the Church of Rome subdued the exarchate of Ravenna, the kingdom of Lombardy, and Rome itself, in the eighth century. In yet another prophecy, found in Daniel 8, the kingdoms of the Medes and Persians were represented by a ram with two horns sprouting forth from its head, one higher than the other; likewise, the Greeks were depicted by a male goat, with one massive horn replaced by four smaller, which according to both ancient and modern interpreters was a clear reference to the way Alexander's kingdom was divided among four of his generals.[411]

[411] *Observations*, 24-127, quoted from 74-75.

4.2.3 The need for chronology

To properly assess how the events prophesied in the books of Daniel and Revelation were connected to past, present, and future, Newton needed a detailed chronology of the four monarchies and the other nations involved. As Humphrey Prideaux put it in his own studies of the prophecies, 'How could the completion of the Prophecy, which we have of Xerxes, and his stirring up of all against the Realm of Grecia… be understood, without having an account of the war which he made against Grecia? Or how could the fulfilling of the Prophecies, which were delivered of Alexander, his swift victories, and his breaking by them the power of Persia… be brought into a clear light, without laying before the Reader the whole Series of those wars, whereby it was effected?'[412] For Newton, as for Prideaux, the study of chronology was not a goal per se, but a necessary element for understanding the prophecies. He focussed primarily on the Roman Empire and its ten horns, and in particular on the eleventh horn with its common interpretation as Antichrist. The many related drafts included elaborate and precise chronologies of the decline of the Roman Empire and the invasions by the Ostrogoths, Visigoths and Vandals in the fourth and the fifth centuries. These chronologies went far beyond those of his contemporaries, as Iliffe convincingly argues: 'Few historians before him offered anything as richly textured as he did in his unpublished writings on the Gothic invasions, and no one offered the completely sanitised account of Goths' morals and religion that he did.'[413] Newton's narrative also included the history of the Church and how it succumbed to idolatrous practices, in particular the introduction of the Trinitarian heresy, as Newton saw it.

What is less obvious, is that many of the chapters from the *Chronology* arose from Newton's studies of these same prophecies. Early drafts for his histories of Assyria, Babylonia, Persia and Media relate directly to the prophecies found in Daniel, and to the histories recorded there and in the books of Ezra and Nehemiah. In the second half of this chapter, I will discuss these

[412] H. Prideaux, *The Old and New Testament Connected in the History of the Jews and Neighbouring Nations… Part 1* (1725 [London, 1716]), xxxi.
[413] *Priest*, 275-79, esp. 276.

relations, the chronological problems Newton tried to solve, and the development of his understanding of the sacred and profane sources involved.

4.3 Rooted in Scripture

As I established in the previous chapters, Newton did not write the 'Theologiae Gentilis Origines Philosophicae' overnight. Originally begun in the middle of the 1680s as a modest treatise on the origins of idolatry, before the end of the decade he had rewritten it twice and subsequently expanded it to include a projected eleven chapters. Here, Newton employed chronology to prove that the origins of all major Mediterranean civilizations could be traced back to Noah and his sons. Although he abandoned the project in favour of the 'Originals', from the list of chapter headings, and in particular from the title of the final chapter, it is clear that Newton intended to go beyond a mere history of the first generations after the Flood and their practices of star worship: 'What the true religion of the children of Noah was like before it began to be corrupted by the worship of false Gods. And that the Christian religion became no more true nor less corrupt.'[414] This concept, of the original Noachian religion, returned in many of his other writings, including various manuscripts related to the history of the Church.[415] One of the drafts for the *Irenicum*, in which he worked out the principles of Christianity as he understood it, began with the claim that '[a]ll nations were originally of the Religion comprehended in the Precepts of the sons of Noah.' These precepts involved to have one God, to worship him alone, to not use his name in vain, no murder, theft, or fornication, to abstain from blood, be merciful to animals, and to set up courts of justice to put these laws in

[414] 'Qualis fuit vera Noachidarum religio antequam per cultum falsorum Deorum corrumpi caepit. Et quod religio Christiana non magis vera nec minus corrupta evasit.' Yahuda Ms. 16.2, fol. 43a^{v}; normalised.

[415] See Keynes Ms. 3, fols. 5, 27; Yahuda Mss. 15.3, fol. 57^{r} and 26.3, fol. 4^{r}; Bodmer Ms., *passim*; see also Goldish, *Judaism*, 40-43, 49-55, 63-64; id., 'Newton's 'Of the Church': Its contents and implications', in *CNI*, 145-64, esp. 145-46.

execution. He had learned about the rabbinic concepts of these seven Noachide laws via the works of John Selden, which, as I have shown earlier, he studied in depth.[416]

4.3.1 Return of the 'Origines'

How prevalent the concept of the original, pure, Noachian religion was for Newton, might be inferred from the fact that he included the entire passage from the *Irenicum* in the *Chronology of Ancient Kingdoms Amended*, in a much-expanded version:

> Several of the laws and precepts in which this primitive religion consisted are mentioned in the book of Job, chap. i. ver. 5, and chap, xxxi, viz. not to blaspheme God, nor to worship the Sun or Moon, nor to kill, nor steal, nor to commit adultery, nor trust in riches, nor oppress the poor or fatherless, nor curse your enemies, nor rejoyce at their misfortunes: but to be friendly, and hospitable and merciful, and to relieve the poor and needy, and to set up Judges. This was the morality and religion of the first ages, still called by the Jews, The precepts of the sons of Noah: this was the religion of Moses and the Prophets, comprehended in the two great commandments, of loving the Lord our God with all our heart and soul and mind, and our neighbour as our selves: this was the religion enjoyned by Moses to the uncircumcised stranger within the gates of Israel, as well as to the Israelites: and this is the primitive religion of both Jews and Christians, and ought to be the standing religion of all nations, it being for the honour of God, and good of mankind…. So then, the believing that the world was framed by one supreme God, and is governed by him; and the loving and worshipping him, and honouring our parents, and loving our neighbour as our selves, and being merciful even to brute beasts, is the oldest of all religions.[417]

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[416] Keynes Ms. 3, fol. 5; NCL Ms. 361.3, fol. 48b^{v}. Goldish, *Judaism*, 42, seems unfamiliar with this passage but lists Selden's *De jure naturali et gentium*… and *De synedriis et prefecturis juridicis veterum Ebraeorum* (Amsterdam, 1650–55) as the most probable sources. See also J.E. Force, 'Newton, the Lord God of Israel, and knowledge of nature', in R.H. Popkin and G.M. Weiner (eds.), *Jewish Christians and Christian Jews: From the Renaissance to the Enlightenment* (Dordrecht, 1994), 131-58, esp. 140-47; Hutton, 'Seven Trumpets', 173-78; Mandelbrote, 'Newton and Biblical criticism', 283-86.

[417] *Chronology*, 188-90. See CUL Ms. Add. 3988, fols. 51^{r}-52^{r} and 3987, fol. 48^{r}; see also Yahuda Ms. 41, fols. 4^{r}-5^{r}.

With these words, Newton ended the long first chapter in which he had employed astronomy and the average of reigns and generations to arrive at a revised Greek chronology. This then formed the basis for his revision of the antiquities of Egypt, Assyria, Babylon, and the empires of the Medes and the Persians. In the chapter on the latter, included by the editors of the *Chronology* but clearly a draft Newton left unfinished, a similar passage appeared. Beginning with Cyrus the Great, who conquered Babylon in 538 BCE, Newton discussed some of his immediate successors, before he arrived at Darius Hystaspes, who had 'reformed the constitution of the Magi.' Drawing on the Roman historians Porphyry and Quintius Curtius Rufus, and on the Suda, he then explained that these Magi were skilled astronomers, and were 'instructed in the mysteries of religion and philosophy' by Darius' father Hystaspes, who had been taught by the Indian 'Gymnosophists', and the legendary Zoroaster.[418] These two had trained their disciples to become priests of a new physico-theological religion, with elements from the Chaldaean tradition in which Zoroaster was brought up, and 'of the institutions of the ancient Brachmans, who are supposed to derive even their name from the Abrahamans, or sons of Abraham, born of his second wife Keturah, instructed by their father in the worship of One God without images,' which Hystaspes had learned when he was in India. From Eusebius' *Praeparatio Evangelica*, Newton then quoted a passage ascribed to Zoroaster, in which he referred to God as 'the first, incorruptible, eternal… indivisible… their doctor, physicist and perfect and wise, and the sole inventor of the sacred physics.'[419] This, Newton declared, was the ancient god and religion of the Persian Magi; but soon, their worship declined into idolatry. How important Newton considered the Magi and their restoration of the ancient, original religion becomes apparent from the *Short Chronicle*, where a summary of the passage returns.[420]

[418] *Chronology*, 347-49. For the growing interest in the eastern philosopher-priest during Newton's days, see S. Gaukroger, *The Emergence of a Scientific Culture: Science and the Shaping of Modernity, 1210–1685* (Oxford, 2006), 24-25, 152-53, 227.
[419] 'Deus est... primus, incorruptibilis, aeternus… sine partibus…. ipse sui doctor, physicus & perfectus & sapiens & sacri physici unicus inventor', *Chronology*, 351-52.
[420] *Chronology*, 40-41.

If Newton's goal had indeed been just to produce a revised chronology that fitted the temporal scheme presented in Scripture, why include such poignant passages on ancient religion? Moreover, Newton did not refer to these as just 'the oldest of all religions.' As he wrote, 'this… ought to be the standing religion of all nations', past *and* present. Those two great commandments he cited, 'loving the Lord our God with all our heart and soul and mind, and our neighbour as our selves,' were, and are still, the main tenets of Christianity, the summary Christ gave to the Pharisees when they asked him, 'Teacher, which is the greatest commandment in the Law?'[421] Thus, the *Chronology* maintained part of what Newton set out to show in the 'Origines', namely the nature of the original Noachian religion; which makes one wonder whether he also intended to include the other half of the title of the final chapter, 'that the Christian religion became no more true nor less corrupt.' In fact, as I will show below, there is evidence that Newton at some point did indeed consider connecting his chronological and theological projects.

4.3.2 Mutual support

Throughout the *Chronology*, Newton emphasized the primacy of Jewish historiography. For example, when discussing the age of the Assyrian empire, Newton argued that the fifth century BCE Greek historian Ctesias could not be relied on. The first six books of his *History of Persia*, which dealt with the Assyrian and Babylonian monarchies, contained many names that did not agree with the Assyrian names found in Scripture, and thus had to be made up. Likewise, he argued from a verse in the book of Nehemiah that the Assyrian monarchy had only begun to gain momentum during the days of Pul – known to us as Tiglath-Pileser III – who ruled between 744 and 727 BCE, and could not have been have been as old as Ctesias would have it. However, these were not the only reasons he had for disagreeing with the Greek historian. Ctesias had significantly misdated the reign of queen Semiramis, placing her life too far back in time compared to the information provided by Herodotus, whom Newton considered

[421] Matt. 22:36-40, NIV.

generally trustworthy. He also argued that the city Nineveh was founded by Ninus, and Babylon by Semiramis, which Newton thought were both founded by either Nimrod or Assur; likewise, Ctesias had extended the reign of the Assyrian monarchs to 1360 years, whereas Newton argued that the time allotted by Herodotus, 500 years, was already much too long.[422]

This did not mean that Scriptural chronology was complete, or infallible; on the contrary, in many cases Scripture needed support. For instance, having identified the god Osiris with the Greek Bacchus and the Egyptian pharaoh Sesostris, Newton argued that 'this King can be no other than [the Biblical] Sesac. All Egypt, including Thebais, Ethiopia and Libya, had no common King before the expulsion of the Shepherds who Reigned in the lower Egypt; no Conqueror of Syria, India, Asia minor and Thrace, before Sesac; and the sacred history admits of no Egyptian conqueror of Palestine before this King.'[423] That the Biblical chronology did not allow for an Egyptian pharaoh to have conquered Palestine before Sesac was not a strong enough argument to stand on its own. The other two arguments, that Egypt remained divided until the times of the Shepherds or Hyksos, and that Sesostris was the first king who conquered all the realms Newton mentioned, were both established without resorting to Scripture, and were not meant to support, but rather to complement it.

In fact, Newton stated, the Biblical record was at times incomplete, and the absence of particular kings or monarchies from Scripture did not mean they had not existed. As he wrote in the chapter on the Persians, 'I have hitherto stated the times of this Monarchy out of the Greek and Latin writers: for the Jews knew nothing more of the Babylonian and Medo-Persian Empires than what they have out of the sacred books of the old Testament; and therefore own no more Kings, nor years of Kings, than they can find in those books...'[424] Moreover, what had

[422] *Chronology*, 265-68; see also Yahuda Ms. 7.3i, fol. 2[r]; *Orig. of Civ.*, 115-16. For Ctesias and the remaining fragments of the *History of Persia* – once a twenty-three volume work that enjoyed tremendous popularity among ancient writers – see *Ctesias' History of Persia*, trans. L. Llewellyn-Jones and J. Robson (New York, 2010). For the identification of Pul as Tiglath-Pileser III, see A.K. Grayson, 'Assyria: Tiglath-pileser III to Sargon II (744–705 B.C.)', in *CAH*, 71-85, esp. 73.
[423] *Chronology*, 193-94.
[424] Ibid., 356. It seems highly likely that Newton's inspiration for this quote was Richard Simon, who in his *Histoire critique du Vieux Testament* (Paris, 1678), Bk. II, 31 of the 1682 London translation

been written down in sacred writ had not always come down unscathed. Newton considered parts of the books of Ezra and Nehemiah to have been mixed up, possibly during the turmoil of the Jewish Revolt of the second century BCE, and he collated these with the apocryphal book of Esdras – a Greek translation of Ezra – to establish a corrected chronology.[425]

4.3.3 The Babylonian Exile

From the days of Solomon's successors onwards, Israel had been in turmoil. The nation had suffered a painful rift in around 925 BCE, when ten of the original twelve tribes split off to form the separate Kingdom of Israel under the rebel king Jeroboam I, who instigated his own idolatrous worship – the episode that Newton had chosen for his 1670s sermon. In around 732 BCE, during the reign of Pekah, the kingdom was first sacked by Tiglath-Pileser III, and again invaded in around 722 BCE, when most of its population was deported to Assyria.[426]

The Kingdom of Judah, consisting of the two remaining tribes, Judah and Benjamin, including Jerusalem, were all that was left of a once prosperous nation; but they would suffer a similar fate. During the early years of the sixth century BCE, under the rule of king Jehoiakim (r. 609–598 BCE), the country was invaded by the Babylonian king Nebuchadnezzar II (r. c. 605–c. 562 BCE) and its people – including a young Daniel, that is, according to the book that bears his name – were subsequently deported to Babylon. After a period of some sixty years, the Persian king Cyrus the Great who had captured Babylon in 538 BCE, allowed the exiled Jews

Newton owned, wrote that 'the chronology… of the Kings of Persia is not at all exact… Some Jewish doctors who would make an entire chronology of the Kings of Persia, from what is contained in the Bible, have made themselves ridiculous.' See also id., Bk. I, 5-6.

[425] See Yahuda Mss. 25.1c, fol. 5^{r}-8^{r}, and 25.1d, fols. 8^{r}-11^{v}; see also Simon, *Critical History*, sig. a(5), who stated that the order of the leaves on which the books of the Jewish Bible were written, had not always been preserved, 'a misfortune which has happened to all ancient books'; but he did not mention the Jewish Revolt. Although Simon did not discuss the discrepancies between Ezra and Nehemiah, he did mention the books of Jeremiah and Job, 'where there are transpositions of verses and whole chapters' found in copies of the Septuagint, as Origen and Jerome had established; Simon, *Critical History*, Bk. 1, 6. What Simon did not provide were possible solutions, like Newton did. See also Schilt, 'Hints of Things', 62-63.

[426] N.P. Lemche, *Ancient Israel: A new history of Israel* (London, 2015 [1988]), 132-35.

to return to Judah and start rebuilding their cities and Temple under the guidance of Zerubbabel.[427] As Newton and his contemporaries were slowly discovering, the Biblical record of these events and the narratives of Jewish historians such as Josephus did not always agree with profane sources, in particular regarding the duration of the captivity. The prophet Jeremiah, who was active during the reigns of the last kings of Judah, had predicted the coming destruction: 'For thus saith the Lord, That after seventy years be accomplished at Babylon I will visit you, and perform my good word toward you, in causing you to return to this place.'[428] Those seventy years remained firmly fixed in the hearts and minds of those held captive in Babylon, including Daniel. When according to his reckoning, seventy years had passed, during the first year of the reign of 'Darius, the son of Ahasuerus', he earnestly sought the Lord in prayer and asked him to make good on his promise.[429]

Those seventy years were also important for Newton, although he suggested they had only begun with the destruction of the Temple of Solomon in 588 BCE, according to his reckoning.[430] Of equal importance were the names of the various Babylonian, Median, and Persian kings reported in Scripture such as the Darius mentioned above. Most of these references appeared in the historical books of Ezra and Nehemiah. Ezra was a scribe and priest who lived during the final years of the exile and returned to Judea in about 457 BCE. He was soon followed by Nehemiah, who would become governor of the now Persian district, and together they were instrumental in the rebuilding of the city of Jerusalem, and the Temple. All their endeavours, including the struggles they encountered with the Samaritan population that had made Judea theirs in the absence of the Jews, were recorded in Scripture with

[427] Modern historians generally assume the exilic period between 586/7 and 538/9 BCE, when Cyrus the Great conquered Babylon; see T.C. Mitchell, 'The Babylonian Exile and the Restoration of the Jews in Palestine (586–c. 500 B.C.)', in *CAH*, 410-60; Lemche, *Ancient Israel*, 180.
[428] Jer. 29:10 and 40:5-10, KJV.
[429] Dan. 9:1-4, KJV. Modern historians put the first deportation of the Jews to Babylon in 597 BCE (Lemche, *Ancient History*, 186); yet it is possible that Daniel, as a young nobleman, had been taken to Babylon following Nebuchadnezzar's conquest of Judea, and thus roughly a decade before the first wave of Jewish captives.
[430] *Chronology*, 295-97. See e.g. Lemche, *Ancient History*, 220, for 587 BCE as the commonly accepted modern dating.

reference to the reigning monarch. Thus Ezra left Babylon 'in the reign of Artaxerxes, king of Persia.' The Jews that returned with Ezra started rebuilding the Temple during 'the days of Cyrus King of Persia', and were hampered by the people of the land 'even until the reign of Darius king of Persia.' Mention is made of letters of protest written to 'Ahasuerus, in the beginning of his reign' and to 'Artaxerxes king of Persia.'[431]

The history of Persia found in non-Biblical sources, such as Berosus the Chaldean, Flavius Josephus, Herodotus, Xenophon, and the *Canon* of Ptolemy, made mention of more than one Artaxerxes and Darius, and no Ahasuerus. To make matters worse, just as with Ctesias and Herodotus on the Assyrian empires, these sources did not always agree with one another, or with the record in Scripture. For instance, according to Josephus, the Samaritan leader Sanballat, who played an important role in the local sabotaging of the building of the walls of Jerusalem and the Temple, lived during the reign of Darius III. But Darius III, also known as Codomannus, reigned more than a century later, from 336 to 330 BCE, his empire being invaded by Alexander the Great in 334. Likewise, although the Greek historian Xenophon (c. 430–354 BCE) seemed reliable in his account of Cyrus the Great, because he wrote of recent events, and had 'framed his book very like true history', he had 'erred in most of the main strokes of y^{e} history'; thus, as Newton put it, 'I cannot forbeare to reccon his book much better then a romance, contrived only to represent Cyrus a Hero.' This did not mean that Xenophon's writings were entirely useless, but could only be trusted 'where he is backt by other authors of good credit who did not borrow from him.'[432] Although John Marsham, who proved to be such a useful source for Newton, had tried to salvage various aspects of Xenophon's account, Newton was not impressed, referring to one of Marsham's solutions as 'a new invention' with 'no foundation in antiquity.'[433] Initially, Newton was also unsure whether he could trust the versions of Ptolemy's *Canon* to which he had access, since at various points they seemed to disagree with one another: 'All y^{e} Canons have been tampered with', he

[431] Ezra 7:1-6 and 4:1-7, KJV.
[432] Yahuda Ms. 7.3i, fol. 2^{r}.
[433] Ibid., fol. 3^{r}.

exclaimed, including the edition presented by Petau in his *Rationarium temporum* (1633) which he could not harmonize with Petau's own writings on the topic.[434]

4.3.4 Getting Scripture right

There were also serious problems with the record as Newton found it in Scripture. Having established from Ptolemy, Berosus, and other sources including Marsham's *Canon chronicus* which Babylonian kings reigned during the captivity, he then had to work out the intricacies of the kingdoms of the Medes and Persians before and at Babylon, and reconcile these with the names presented in Ezra, Nehemiah, and other books. As an example, Daniel 2 tells that Nebuchadnezzar received the dream of the statue during the *second* year of his reign, which was subsequently explained to him by Daniel who served at the court. However, this verse is problematic because it does not agree with the chronology established in the first chapter. There it reads that Nebuchadnezzar besieged Jerusalem in the third year of Jehoiakim, the vassal king appointed by Necho II of Egypt in 608 BCE, and subsequently carried a young Daniel and other noble Hebrews away to Babylon. According to the fifth verse of the chapter, they were subsequently trained in the Chaldean arts and sciences for a period of three years, before they were deemed fit to serve the king. Thus Daniel could not have had a position at the court before the *fourth* year of Nebuchadnezzar's reign.

This issue had obviously not escaped early historians. In the greater Jewish chronicle, *Seder Olam Rabah*, which probably dates from the second century CE, a simple solution was

[434] Yahuda Ms. 10b, fol. 7^{v}. Newton listed four editions of the *Canon*: Scaliger's – imperfect – edition of Ptolemy's *Handy Tables*, of which the *Canon* forms an integral part, included in his *Thesaurus Temporum* (Leiden, 1606), to which he in one passage mysteriously referred to as the 'Genethlic' (fol. 7^{v}); but *genethliac* is a term from astrology found in Ptolemy's *Tetrabiblos*, and not in the *Handy Tables*; that of Petavius, of which he owned the 1694 edition printed in Franeker; the 'depraved Ecclesiastic one' (fol. 9^{v}), which is found in the *Extract of Chronography* of Syncellus; and the one 'reputed most correct ...found in a manuscript of Theon', which he elsewhere abbreviated as 'cod. Angl Theonis' (fol. 8^{v}), which must refer to the fourth century mathematician associated with the Alexandrian Museum who wrote two commentaries on the *Handy Tables*; see Depuydt, 'Ptolemy's Royal Canon', 104.

provided: 'Scripture counts the years after the destruction of the Temple.'[435] Thus the second year of Nebuchadnezzar should be understood as the second year after the destruction of the Temple, which only happened in about 587 BCE. Writing a century before the Jewish chronicle, Josephus chose to interpret the text as referring to 'the second year from the sack of Egypt', after which Nebuchadnezzar had returned to Babylon.[436] Scaliger, in his *De Emendatione Temporum* of 1583, also provided a simple solution: he ignored the matter; and so did Ussher, who seemed oblivious of any chronological problems. Prideaux, writing in the early eighteenth century, devoted ample time to the question, explaining that the Jewish historians made the reign of Nebuchadnezzar begin at the end of the third year of Jehoiakim, when his father Nabopolassar had sent him with an army to Syria and Palestine to oppose Necho. However, towards the end of the fifth year of Jehoiakim, Nebuchadnezzar returned to Babylon upon the death of his father, which is when the Babylonian account began. As he explained, when Daniel in chapter 2 referred to the second year of Nebuchadnezzar, he used the Babylonian reckoning, which agreed with the seventh year of Jehoiakim and the fourth year of Nebuchadnezzar according to the Jewish calculations.[437] Although Newton took great pains in explaining the differences between the Babylonian and Judean timekeeping, he did not mention the passage from Daniel 2 in the *Chronology*. Instead, he explained that

[435] H.W. Guggenheimer (ed.), *Seder Olam* (Lanham, MD, 2005 [1998]), 237. For dating the *Seder Olam*, see C.J. Milikowsky, 'Seder Olam: A Rabbinic Chronography' (Yale, diss., 1981), 12-24, and id., ''Seder Olam' and Jewish Chronography in the Hellenistic and Roman Periods', *Proceedings of the American Academy for Jewish Research*, 52 (1985), 115-39. The work is not to be confused with *Seder Olam, or the Order of the Ages* (London, 1694), an originally Latin treatise by J.B. van Helmont on the prophecies in the book of Revelation, or, as Brian Copenhaver calls it, 'a medley of apocalyptic chronology and Cabalist exegesis'; see B.P. Copenhaver, 'Jewish theologies of space in the scientific revolution: Henry More, Joseph Raphson, Isaac Newton and their predecessors', *Annals of Science*, 37 (1980), 489-548, esp. 540; Cf. G.W. Trompf, 'Isaac Newton and the Kabbalistic Noah: Natural Law Between Mediaevalia and the Enlightenment', *Aries*, 5 (2005), 91-118, esp. 100-01, who asserts (p. 101 n. 55) that Newton owned two copies of *Seder Olam*, listing Harrison nos. 751 and 1479. The latter is Van Helmont's *Seder Olam*; the former is another work by Van Helmont that has no relation to the subject matter.

[436] Josephus, *Jewish Antiquities*, 10.195.

[437] Prideaux, *Old and New Testament Connected*, 83-95.

Nebuchadnezzar was made king by his father two years before Nabopolassar died, in the fourth year of Jehoiakim, and that the Jews reckoned this to be the first year of his kingship.[438]

Another precarious issue was the person of Darius the Mede. Frequently mentioned in the book of Daniel in direct connection with a series of prophecies, the identity of Darius the Mede, 'the son of Ahasuerus', was hotly debated.[439] Apparently not one non-Jewish source knew about a Darius the Mede that lived just before or after Cyrus the great, or at least, by that name. In Daniel, Darius the Mede was presented as the one who 'took the kingdom' from the Babylonians; but this feat was also ascribed to Cyrus, as recorded in various other places of Scripture and unanimously testified to by all classical writers. Controversially, Scaliger had identified Darius with Nabonidus – or Belshazzar – the last king of Babylon, and had suggested that the taking over of the kingdom had been a peaceful affair, thus providing space for Cyrus to do the real conquering seventeen years later.[440] James Ussher and, sometime later, Peter Heylyn, following Josephus, Jerome, and Calvin, decided that Darius had to be Cyaxeres, the son of Assuerus or Astyages, who ruled as king of the Medes, and that he was a brother of Cyrus' mother. When Cyrus had taken over the Babylonian empire he handed it over to Darius, although Ussher did not explain why.[441] Prideaux explained that, though Darius might have been king, this was all by the grace of Cyrus, who had 'the whole power of the Army, and the chief conduct of all affairs… still in his hands', with Darius having 'no more than the name and the shadow of sovereignty' and therefore left out of Ptolemy's Canon.[442]

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[438] *Chronology*, 292-301, 313. See also Yahuda Ms. 7.1a, fols. 3^{r}-4^{r}.

[439] Dan. 5:32, 9:1, and 11:1.

[440] Scaliger, *De Emendatione Temporum*, 278-80.

[441] Ussher, *Annales Veteris Testamenti*, Vol. 1, 138, 145; P. Heylyn, *Cosmography, The Third Book, Containing the Chorography & History of the Lesser and Greater Asia...* (London, 1668), 121-22. Neither Ussher nor Heylyn provided any references to support their claims, apart from Xenophon and passages from Scripture, but Josephus, *Judean Antiquities*, 10.248, has 'Darius, who crushed the Babylonian hegemony with his relative Cyrus, was sixty-two years old when he took Babylon. He was a son of Astyages, but was called another name among the Greeks'; trans. C.T. Begg and P. Spilsbury, 'Judean Antiquities 10, Whiston 11.4, Niese 245-249', in S. Mason (ed.) *Flavius Josephus Online.* See also Jerome, *Commentary on Daniel*, 5; J. Calvin, *Praelectionis Ioannes Calvini in librum Prophetarium Danielis…* (Leiden, 1571 [1561]), 99^{v}.

[442] Prideaux, *Old and New Testament Connected*, 177. The debate about the identity of Darius the Mede continues to this day. In 1935, Harold H. Rowley argued against the historicity of Darius,

Arthur Bedford, writing in 1730, solved the issue by suggesting that Darius was granted a joint title by Cyrus and reigned in Cyrus' stead – but only nominally, until Cyrus returned from his campaign through Syria and Egypt.[443] Meanwhile, in the 1680s, Henry More also insisted that it was indeed Cyrus who had conquered Babylon, and that he 'delivered the Empire to his Uncle Darius the Mede', but that Darius died soon after and was succeeded by Cyrus.[444] However, according to More, Darius was not Cyaxeres, but Cyaxerxes' son. His argument revolved around a series of linguistic exercises showing that 'Artaxerxes' in fact meant 'great magnificent Xerxes' and thus that Ahasuerus, Xerxes, and Artaxerxes all referred to the same person; 'Cyaxeres' then meant 'father of Xerxes'. Darius in turn was not a name, but a title bestowed upon their kings by the Medes. Likewise, as he informed his readers, the 'Darius who was vanquished by Alexander, is, as Grotius has noted, called Artaxerxes by Jacchiades', further justifying his identification of Darius the Mede with Artaxerxes.[445] With Grotius, More seemed to have had a love-hate relationship. On the one hand, he praised him for his assiduous scholarship, which he used to his advantage; on the other, he fiercely rebuked Grotius for his refusal to identify Antichrist with the Pope.[446]

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considering him a fictional character made up by the author of Daniel. Although other explanations have been presented, including the controversial – and ill-substantiated – identification of Darius the Mede with none other than Cyrus the Great, by Donald J. Wiseman, Rowley's theories have remained the scholarly consensus. See Rowley, *Darius the Mede*, 44-60, esp. 59; D.J. Wiseman, 'Some Historical Problems in the Book of Daniel', in id., *Notes on Some Problems in the Book of Daniel* (London, 1965), 9-16. See L.L. Grabbe, 'Another look at the Gestalt of 'Darius the Mede'', *Catholic Bible Quarterly*, 50 (1988), 198-213, and B.E. Colless, 'Cyrus the Persian as Darius the Mede in the book of Daniel', *Journal for the Study of the Old Testament*, 56 (1992), 113-26, for a revival of Wiseman's theories.

[443] A. Bedford, *The Scripture Chronology demonstrated by Astronomical Calculations...* (London, 1730), 711.

[444] More, *Exposition,* 9.

[445] Ibid., 115-19, quoted from 118.

[446] Ibid., xxxvii-iii, 119. Grotius is considered the first Protestant theologian who adopted a preterist view on the prophecies in Daniel and the Apocalypse. In his *Annotationes in Novum Testamentum* (3 vols., Amsterdam and Paris, 1641–50), he suggested that most of these prophecies – including the coming of Antichrist – had been fulfilled during the first centuries CE. See J.-P. Heering, *Hugo Grotius as apologist for the Christian religion: a study of his work* De veritate religionis Christianae*, 1640* (Leiden, 2004). See also J. van den Berg, 'Grotius' views on the Antichrist and Apocalyptic thought in England', in H.J.M. Nellen and E. Rabbie, *Hugo Grotius, Theologian: Essays in Honour of G.H.M. Posthumus Meyjes* (Leiden, 1994), 169-83, esp. 179; Levitin, *Ancient Wisdom*, 468-69.

Newton, from the earliest drafts onwards, took a route that very much echoed More's, but with some subtle differences. In Daniel 9 he read that Darius was the son of Assuerus; claiming that 'Achsuerus, Oxyares, & Axeres or Cy-Axeres that is Prince Axeres' were all variants of the same name, Darius was therefore the son of Cyaxeres.[447] He supported this claim by arguing that in the apocryphal book of Tobit, the king who took Nineveh was called Assuerus. Since Herodotus called him Cyaxeres, both names had to refer to the same person. He further included a few lines from the poet Aeschylus, where mention was made that 'he that led the army was a Mede; the next, who was his son, finished the work… the third one was Cyrus, a happy man.'[448] As Newton understood the verse, the Medo-Persian Empire had been founded by the two immediate predecessors of Cyrus, namely the Mede who led the army, and his son, who had to be Darius, the immediate predecessor of Cyrus. His father then had to be the other Assuerus whom together with Nebuchadnezzar conquered the Assyrians.[449] With the Medes reigning over the Medo-Persian Empire, Cyrus could never have been general of the entire army, let alone king, but might have led a body of Persian forces. Returning victoriously, it did not take long before he revolted against Darius and various battles ensued, the last one fought at Pasargadae, where Darius was captured by Cyrus, who thus assumed the throne.

Newton corroborated all of this with passages from the Suda, Strabo, Herodotus, and Xenophon, although, as he readily admitted, the latter two stated that the Median king whom Cyrus defeated was named Cyaxeres or Astyages.[450] However, as he asserted, 'these Kings were dead before, and Daniel lets us know that Darius was the true name of the last King, and Herodotus, that the last King was conquered by Cyrus in the manner above described; and

[447] Yahuda 7.1a, fol. 4^{r}; *Chronology*, 307. In other versions of the text Newton added that 'Ctesias & Alexander Polyhistor call him Astirbares that is Astivares or Assueris', Yahuda 25.1d, fol. 5^{r}; see also ibid., fol. 3^{v}. In the *Chronology*, 299 and 309, Newton retained the identification with Astibares, but with Eupolemus as his source.
[448] Yahuda Ms. 25.1d, fol. 6^{v}; *Chronology*, 308. See Aeschylus, *Persians*, 765-70.
[449] *Chronology*, 299.
[450] Ibid., 330-31. Xenophon, *Cyropaedia*, 8.7.1; Herodotus, *Histories*, 1.127 ff. Strabo, *Geography,* 15.3.8 also names the Median king as Astyages.

the Darics coined by the last King testify that his name was Darius.'[451] Newton was quite right that Astyages had died before Cyrus succeeded to the throne in 538, because Cyrus had beaten him during the battle of Pasargadae in 550 and he died in captivity not long after. But Newton placed the battle after the fall of Babylon, conveniently creating a Median king for Cyrus to defeat who could be no other than Darius. From all this, it is clear that Newton never questioned the historicity of Darius the Mede, or the accuracy of the Biblical record. Although he realised that the books of Scriptures had not all survived unscathed, as I will show below, and that the Jews in their histories recorded only the kings known to them, the fact that Darius was mentioned by the prophet Daniel placed his existence beyond all doubt.

4.4 Sacred accuracy

4.4.1 The Kings of Babylon

Eventually, Newton arrived at the following list of Babylonian, Median, and Persian kings that ruled over Babylon during and after the exile, derived from classical sources; see **Table 1**. The list, which I have compiled from various chapters from the *Chronology*, contains many names not found in to Ptolemy's *Canon*, including the short-lived reigns of Laboasserdach or Labashi-Marduk, Xerxes II, and Sogdian. Finding out about these rulers through Berosus,

[451] *Chronology*, 329-30. Newton's source for this passage was the entry on Δαρεικούς or Darics in the *Suda*, which its Byzantine author had copied directly from Harpocration. The passage from the Suda states that these Darics 'were not named after Darius the father of Xerxes but after some other more ancient king of that name', '...οὐκ ἀπὸ Δαρείου τοῦ Ξέρξου πατρός, ἀλλ' ἀφ' ἑτέρου τινὸς παλαιτέρου βασιλέως ὠνομάσθησαν'. The other references Newton mentioned, Harpocration and the scholiast on Aristophanes, are listed in the notes of the edition he used; see *Suidas, nunc primum integer Latinitate donatus...opera & studio A. Porti...* (2 vols., Cologne, 1619), Vol. 1, 640. See also BL Lansdowne MS 801, fol. 5^{v}, in the hand of Hopton Haynes, Newton's assistant at the Mint, in a section titled 'Generall Observations on the Ancient State and use of Money in Commerce': 'Darius a King of the Medes and Persians, ancienter than Hystaspis, coined pure gold without any allay,' with a note reading 'Suidas and Harpocration'.

Name (Newton)	Also known as…	Began to reign (BCE)
Nebuchadnezzar		604
Evilmerodach	Amel-Marduk	561
Neriglissar		559
Laboasserdach	Labashi-Marduk	556
Nabonnedus	Nabonidus	555
Darius the Mede		538
Cyrus the Persian	Cyrus the Great	536
Cambyses		529
Mardus	Smerdis the Magus	522
Maraphus and Artaphernes	Artaphrenes	521
Darius Hystaspes	Darius the Great	521
Xerxes	Xerxes I	485
Artabanus	Artapanus	464
Artaxerxes Longimanus	Artaxerxes I	464
Xerxes	Xerxes II	424
Sogdian		424
Darius Nothus	Darius II	424
Artaxerxes Mnemon	Artaxerxes II	405
Artaxerxes Ochus	Artaxerxes III	359
Arses or Arogus		338
Darius Codomannus	Darius III	336

Table 1. Newton's dates for the kings who reigned at Babylon from the days of the Babylonian captivity (Nebuchadnezzar invaded Syria and Judea in 606 BCE) until the conquest of the Persian Empire by Alexander the Great in 332 BCE. Compiled from *Chronology*, 1-42, 294-331, 347-76.

Ctesias, Herodotus, Jerome, and Eusebius, Newton explained their absence from the *Canon* by stating that their reigns had been included with that of their predecessors.[452] The episode

[452] See Yahuda 25.1d, fol. 5^{v}. For Laboasserdach or Labashi-Marduk, see D.J. Wiseman, 'Babylonia 605–539 B.C.', in *CAH*, esp. 243; for Artabanus, see Jerome, *Chronicle*, 1.1.192. Artabanus appears in Manetho's kings list as reported by Africanus (the 27th dynasty, from Cambyses to Darius Nothus, also ruled over Egypt); Sogdian appears in both. See Africanus, *Chronographiae*, F73, in M. Wallraff et al. (eds.), *Iulius Africanus Chronographiae: The Extant Fragments* (Berlin and New York, 2007), 225-27; Newton bookmarked Artabanus in his copy of Scaliger's *Thesaurus Temporum* (Amsterdam, 1658), 'Victoris Episcopi Tununensis [i.e Africanus] Chronion', 353. See also Waddell, *Manetho*, Fragments 70-71, 174-77; P. Briant, *From Cyrus to Alexander: A History of the Persian Empire* (Winona Lake, IN, 2002), 563-65.

involving Smerdis the Magus is particularly poignant. According to Herodotus, Cambyses had had his brother Smerdis or Bardiya killed, because he feared Smerdis would try to usurp the throne. However, apart from Cambyses and the actual killer, no one knew about Smerdis' death. Seizing the opportunity, one of the Magi, also named Smerdis, assumed his namesake's identity and reigned for seven months, while Cambyses was away in Egypt. Originally suspecting that the real Smerdis was still alive, Cambyses soon found out the truth, but died before he could return to Babylon. Eventually, Smerdis was ousted by a party of seven noblemen, killing him and many of the other Magi – with one of the seven, Darius, assuming the throne; thus Herodotus. From Aeschylus' poem *Persians*, Newton learned that Cyrus' son was succeeded by Mardus, 'a disgrace to his fatherland and ancient throne', as the poet lets Darius say, which would have been an apt description for the treacherous deeds of Smerdis. However, instead of putting his own name next, Darius added two more kings: Maraphis and Artaphrenes, without providing any further details. Newton suggested that they reigned for only a few days.[453] In his calculations on the average reigns of kings, Newton mentioned 'the ten Kings of Persia; Cyrus, Cambyses, &c.' who reigned 208 years, a figure which does not match the timeline he provided in the *Short Chronicle* where Cyrus' reign began in 536 BCE and Alexander the Great conquered Persia in 332 BCE. It also shows that in 1717 he had not yet included the short-reigning monarchs; yet by the time of drafting the *Chronology*, he might have decided to include them to lower the average length of their reigns and thus his overall total.

Newton's 'amended' chronology of the kings that reigned over Babylon obviously disagreed with that of Henry More, with whom Newton had been discussing the prophecies in Daniel and the Apocalypse in the late 1670s and early 1680s.[454] But then More never worked out a full

[453] Aeschylus, *Persians*, 772-79, trans. C. Collard (Oxford, 2008), 23; Newton, *Chronology*, 347. Artaphrenes is usually not equated with his namesake involved in the Ionian Revolt (499–493 BCE), who was a brother of Darius I, most likely because Herodotus does not mention him in his story of Smerdis the Magus; see Herodotus, *Histories*, 5.25 ff.; see also H.T. Wallinga, 'The Ionian Revolt', *Mnemosyne*, 37 (1984), 401-37.

[454] *Priest*, 252-59, and id., 'Making a Shew', 68-75.

chronology, which would have been quite a challenge given his assertion that Darius, Xerxes, and Artaxerxes were all different names for the same person.[455] However, it also disagreed with the record in Scripture, and thus Newton set himself to the task to harmonise both genealogies.

4.4.2 Reconstructing Ezra and Nehemiah

Having established a full record of the kings that ruled over Babylon primarily from Greek and Roman historians, Newton turned to sacred chronology. The Jewish Greater Chronicle, *Seder Olam Rabbah*, provided a rather distorted record of the Babylonian, Persian, and Median Empires because it took into account only those kings and names mentioned in Scripture. Moreover, its compilers understood every instance of the names Darius and Artaxerxes to refer to the same king, leading to impossible chronologies.[456] Therefore, as Newton stated in the *Chronology*, 'it was necessary to have recourse to the records of the Greeks and Latines, and to the *Canon* recited by Ptolemy, for stating the times of this Empire. Which being done, we have a better ground for understanding the history of the Jews set down in the books of Ezra and Nehemiah, and adjusting it; for this history having suffered by time, wants some illustration…'[457] Those illustrations were long in the making, and Newton attempted various strategies to identify all the Dariuses and Artaxerxeses. Early on in his research he realised that the order in which the narrative of the return of the Jews out of Babylon occurred in the books of Ezra and Nehemiah, did not always make sense. The author of Ezra informed his readers in chapter four how the city Jerusalem and the Temple were being rebuilt during the days of Cyrus, Ahasuerus, and Artaxerxes, the final verse of the chapter read: 'Then ceased the work of the house of God which is at Jerusalem. So it ceased unto the second year of the

[455] More, *Exposition*, 118.
[456] See also ASC Ms. N47 HER, fol. 34, for Newton's notes from another Jewish chronicle, R. David Ganz's *Zemah David* ('David's Offspring), translated by Wilhelm Vorstius as *Chronologia Sacra-Profana a mundi conditu ad annum M. 5352 vel Christi 1592, dicta* צמח דוד *Germen Davidis auctore R. David Ganz. Cui addita sunt Pirke vel capitula R. Elieser...* (Leiden, 1644); although he ended these notes with 'Haec ex Chronologia R. David Ganz', they might have originated from another source.
[457] *Chronology*, 356.

reign of Darius king of Persia', with the word 'then' supposedly referring to the events described earlier in the chapter. The first verses of chapter five then related how the Jews, led by Zerubbabel and Jeshua, the son of Jozadak, began to rebuild the Temple, which could only mean a continuation of the work described in the previous passage. But that would mean that the rebuilding of the Temple had begun before the Jews returned under Zerubbabel, which seemed highly unlikely, as it would also mean that the Ahasuerus and Artaxerxes mentioned in chapter four had to be Cambyses and Smerdis, two kings who reigned during the middle of the seventy years captivity, as Newton had established earlier.[458]

As a solution, Newton suggested that the final verse of the fourth chapter was actually the first verse of the fifth chapter, and that the word translated as 'then' had a much broader temporal meaning in Hebrew, or in Latin for that matter: '[T]he Hebrew word בֵּאדַיִן tunc, is of such a generall signification that it sometimes signifies eternity, & therefore may be here naturally enough interpreted generally of y^{e} times past.'[459] Translating the first word with 'illis diebus' or 'tunc', 'in those days', and attaching the verse to the beginning of chapter five would mean that Ezra had simply started a second narration of the events surrounding the return of the Jews and the struggles surrounding the rebuilding of the Temple. This also meant that Ahasuerus and Artaxerxes could be identified as Xerxes and his son Artaxerxes Longimanus, for which Newton provided additional evidence from Herodotus, Plutarch, Strabo, Ctesias and the *Suda*. From Ctesias and Herodotus, he argued that Cyrus had not levied any taxes onto his sons, and that it was only Darius Hystaspes who first imposed taxes, which he collaborated by Strabo and the Suda. Plutarch said that Darius had been rather moderate in his taxes, whereas the taxes imposed upon the Jews according to Ezra 4:13 were steep. Therefore, the kings mentioned there could not have reigned before Darius, and thus had to be the Xerxes who succeeded Darius Hystaspes, and his son Artaxerxes Longimanus.[460] For all the

[458] But see Prideaux, *Old and New Testament Connected*, 245, who insisted on exactly this identification.
[459] Yahuda Ms. 10b, fol. 6^{r}, normalised. Mind how Newton in various places mistakenly wrote 'Ezra 4:27' for 'Ezra 4:24', e.g. fol. 10^{v}.
[460] Yahuda Ms. 10b, fols. 6^{r}, 10^{r}-^{v}.

argument's cleverness and the employment of a variety of sources, Newton was in fact entirely reliant on Barnabé Brisson's *De Regio Persarum* (1590), where the same discourse can be found.[461]

In his attempt to reconcile the seemingly conflicting narratives found in the two books of Ezra and Nehemiah, Newton was facing other challenges. In Ezra 3:4, it is said that the Israelites celebrated the feast of tabernacles, as soon as they had returned from the Babylonian captivity with Zerubbabel. Yet the narrative in Nehemiah 8-11 stated that the feast was celebrated much later, after the walls of Jerusalem had been rebuilt. Newton thus suggested early on in his research that these chapters belonged to the time of Zerubbabel, and had to be read according to the chronology presented in Ezra 3. In the *Chronology*, he provided a more detailed – and expanded – selection: '...the book of Nehemiah, from the 5th verse of the seventh chapter to the 9th verse of the twelfth: for Nehemiah copied all this out of the Chronicles of the Jews, written before his days.'[462] In one of his early drafts, he provided a clear analysis of where the passage should go – after Ezra 2 – and how parts of the books were mixed up during the times of Judas Maccabeus and Antiochus Epiphanes, providing various other examples were the Scriptures had clearly 'suffered by time'.[463] One of the examples included 'a part of Ezra 4 from verse 6 to verse 24... a loos record… w^{ch} he y^{t} put y^{e} collected papers together knew not where better to insert', thereby providing a different explanation for the discontinuity between chapters four and five. Newton also pointed out that the apocryphal book of Esdras had suffered a much similar fate: 'y^{e} book of Esdras be not authentick because made manifestly put together in a wrong order' although most of the histories recorded in the book were reliable, being 'nothing els but fragments of y^{e} books of Ezra & Nehemiah'.[464] As Newton argued, the existence of Esdras, with its haphazardly ordered contents, was actual proof that the books of Ezra and Nehemiah had fallen apart, thus legitimizing his attempts at reconstruction. Soon,

[461] B. Brissonius, *De Regio Persarum Principatu Libri Tres* (Heidelberg, 1595), 122-24; see *Library*, 111. The argument also returns in Ussher, *Annales*, Vol. 1, 169-70.
[462] *Chronology*, 358.
[463] Yahuda Ms. 25.1d, fols. 10^{v}-11^{v}; *Chronology*, 358.
[464] Yahuda Ms. 25.1d, fol. 11^{v}.

however, he would change his mind about the relative reliability of Ezra, Nehemiah, and Esdras.

As Newton considered originally, the collector of the papers had not just mixed up Ezra and Nehemiah, but in fact the writings of *two* Ezras and *two* Nehemiahs.[465] Ezra, the son of Seraiah, the son of Azariah, the son of Hilkiah, as he is named in chapter seven of the eponymous book, must have been a different person from the Ezra listed among the priests that returned with Zerubbabel, found in Nehemiah 12. Likewise, the Nehemiah mentioned in the second book of Ezra must have been older than the Nehemiah who returned to Israel to help his people rebuild Jerusalem and the Temple. This also suggested that the Darius and Artaxerxes mentioned in Ezra 4 were Darius Nothus and Artaxerxes Mnemon, which Newton initially accepted, most likely on the authority of Scaliger.[466] However, he soon noticed the remarkable parallels between various passages in the books of Ezra and Nehemiah, which he originally put in the reigns of different Persian and Median kings. The most striking of these parallels consisted of a long list of priests who had come back from Babylon, and a second list of priests who renewed the covenant with the Lord, both found in the book of Nehemiah. As Newton showed by writing down both lists alongside each other, most of the names matched, and thus referred to the same persons, with events happening around the same time. Since both lists included an Ezra and Nehemiah, these had to be the same person, following his own rules of reasoning of opting for the simplest solution. This also explains why in the *Chronology* he expanded the section of the book of Nehemiah to include the first nine verses of chapter twelve, where the list of priests who returned from the captivity returned.[467]

As I mentioned above, the Jews struggled in rebuilding Jerusalem and the Temple because of local interventions, in particular the machinations of the Samaritan Sanballat. Eventually they managed to persuade 'Darius, king of Persia' – as he is named in Ezra 4:24 – to allow

[465] Ibid., fols. 7^{r}, 10^{v}-12^{v}.
[466] Yahuda Ms. 10b, fol. 11^{r}. J.J. Scaliger, *Opus Novum De Emendatione Temporum* (Paris, 1683), 284-85. See also Yahuda Ms. 14, fol. 95^{r}.
[467] *Chronology*, 360; see also Yahuda Ms. 25.1d, fol. 6^{r}.

them to continue and finish the work. However, both ancient and contemporary scholars were in disagreement about which Darius this concerned: Darius Nothus, Darius Hystaspes, or Darius Codomannus.[468] Josephus remarked that Sanballat was appointed governor of Samaria by Darius Codomannus (r. 336–331 BCE), the Darius whom Alexander the Great overcame. From the genealogy of kings Newton had drawn up by then, only Darius Hystaspes made sense, with the Temple completed during the subsequent reign of Artaxerxes Longimanus. He now argued that Ezra 4:6-24 had to be moved to the end of the book, thus overruling his earlier interpretation involving the translation of the first word, 'then'. What also changed were Newton's thoughts about the reliability of Esdras, which he now recognised as a Greek translation of 'the genuine book of Ezra' with some additions and interpolations, but with the text in general in the right order.[469] Here he went against his erstwhile disciple, William Whiston, who argued that 'the present Apocryphal Esdras… seems to be a little imperfect and disordered, as we now have it.'[470]

Most of Newton's arguments for identifying the Darius of Ezra 4:24 as Darius Hystaspes involved averages and lifespans of the various personae involved, similar to the techniques he employed in the 'Originals' and in the first chapter of the *Chronology*. This including Ezra and Nehemiah, whom, if they had still lived during the reign of Darius Nothus and Artaxerxes Mnemon, would have reached impossible ages, the same argument he used earlier to prove there had been two Ezras and Nehemiahs.[471] Instead, since he now understood that there had been only one Ezra, and one Nehemiah, both must have lived during the times of Darius Hystaspes and Artaxerxes Longimanus. Subsequently, the record in Scripture could be amended through the use of the book of Esdras, in which the book of Ezra returned in more or less the original order.[472] In fact, the whole idea of two Ezras and two Nehemiah now

[468] Yahuda Ms. 25.1d, fol. 5^{v}.
[469] Ibid., fols. 8^{r}-9^{r}.
[470] W. Whiston, *An Essay towards Restoring the True Text of the Old Testament...* (London, 1722), 53-54.
[471] Yahuda Ms. 25.1d, fols. 14^{r}-15^{r}.
[472] In fact, Scripture does mention a second Nehemiah. The author of the eponymous book is named Nehemiah, the son of Hachaliah, in Neh. 1.1; in Neh. 3:16 there is mention of a namesake,

seemed silly. The Sanballat mentioned by Nehemiah was introduced as Sanballat, the Horomite, from a city in Moab, but the Sanballat in Josephus came from beyond Euphrates, and thus had to be two different persons.[473] Yet, as Newton told his audience, if they were unwilling to accept the existence of two Sanballats, they would either have to allow two Ezra's, both of them scribes and priests, and two Jewish governors named Nehemiah, with the same father, or accept that both Ezra and Nehemiah would have lived for about two hundred years.

4.4.3 A Critical Approach

What is clear from the above is that Newton's purpose was *not* to corroborate the profane record with the sacred. Rather, it was the other way round: he used his newly established framework for the history of Persia, to adjust the history of the Jews found in the books of Ezra and Nehemiah. In the chapter on the Persian monarchy, having introduced its history via various Greek and Latin writers, Newton then summed up what fragments the books of Scripture provided. What followed was an augmented record of sacred chronology, where Newton set the events recounted in Ezra and Nehemiah in the right order, and provided the correct names for the Persian and Median rulers involved. Having thus reconstructed a coherent narrative of the history of Persia from both profane and sacred writers, he finally turned to the annals of the Persians themselves, taking as his source the translated works of Mīr-Khwānd.[474] Identifying each of the Persian names with their Scriptural or classical equivalent, he concluded that the oldest dynasty, that of the Pischdadians, had to correspond with the monarchy of the Medes and Persians, and the next, the Kaianides, with the Assyrians. In the margins of the volume he used, he equated the Persian king Lorasph – or Lohorasp – with 'Kai Axeres' or Cyaxeres. Lohorasp's son Gustasph – or Kischtasp – would then have to

Nehemiah, the son of Azbuk. For a contemporary of Newton who indeed believed there had been two Ezras, see W. Lowth, *A Commentary upon the Prophecy of Daniel and the Twelve Minor Prophets* (2 vols., London, 1726), Vol. 2, 140.

[473] Yahuda Ms. 25.1d, fols. 15^{v}-16^{r}.

[474] Mirkhond (actual name Muḥammad Ibn Khāvandshāh Ibn Maḥmūd, nicknamed Mīr-Khwānd), *History of Persia* (London, 1715). See also A. M. Ansari, 'Mīrkhwānd and Persian Historiography', *Journal of the Royal Asiatic Society*, 26 (2016), 249-59.

be Darius the Mede, the son of Cyaxeres, as Newton identified him earlier; but in the margins he added 'Darius Hystaspis', possibly because of the similarity between Gustasph and Hystaspis.[475]

In the *Chronology*, Newton explained that the Persian historians were ambivalent about their identification: by saying that this Kischtasp was contemporary with Ezra and Zorosaster, they took him for Darius Hystaspes. However, they also said he was contemporary with Jeremiah, who lived during the beginning of the captivity, and with Daniel, and thus had to be Darius the Mede.[476] These and other incongruities, with kings' reigns extended to a hundred years or more, were the reasons that Newton only turned his attention to these writings to fill in details, rather than use them for a foundation. Oddly enough, in the *Chronology*, Newton ended the earlier chapter on the Assyrians with the question, 'Whether the Pischdadians whom the Persians reccon to have been their oldest kings, were Kings of the Kingdom of Elam, or of that of the Assyrians... I leave to be examined' with Persia called Elam in Scripture.[477] This is perhaps not so strange when we realise that the *Chronology* was never finished. Apparently, Newton was still in the process of harmonising the various accounts when he died.

Returning to Scripture, it is not entirely clear when Newton began to seriously doubt the accuracy of the record presented in Ezra and Nehemiah. Initially, he suggested that only chapters eight to eleven of Nehemiah were in the wrong place, but he soon insisted on a more surgical approach. From early on in his studies of the history of the Babylonian and Persian empires, he employed a critical view towards the gestation of the Old Testament and how the various books had survived throughout the ages, in particular during the times of the Maccabean revolt in the second century BCE. Just as with the books Ezra and Nehemiah, he considered that the various parts of the book of the prophet Jeremiah had been put together in the wrong order, and that one of its sections had ended up with the book of the prophet

[475] Mirkhond, *History of Persia*, 95, 70. *Chronology*, 356-76. See also *Library*, 193.
[476] *Chronology*, 374.
[477] Ibid., 293.

Zechariah. He identified similar errors in the book of Job and the first book of Samuel, where the text 'by the like accident ha[d] been set together in the wrong order.' The books of Judges and second Chronicles had suffered a similar fate, and the book of the Chronicles of the Kings of Israel, often mentioned in first and second Kings, had been lost entirely.[478] In later drafts, he would expand upon this list, adamant that many of the purely chronological books, which included Judges, the first and second book of Samuel, the first and second book of Kings, and the first and second book of Chronicles, contained factual errors. This was either because they had been written up long after the events took place, or because they had used information from other writings no longer extant. In a passage that would be published as part of the *Observations*, Newton listed all of these writings: '...the book of the Acts of Solomon… the book of Nathan the Prophet, and the book of Gad the Seer… the book of Shemajah the Prophet, and the book of Iddo the Seer…' and many more. He also insisted that Daniel could not have written all of the book of Daniel: parts of the text were added afterwards, possibly by Ezra, whom according to Newton had also compiled the books of Kings and Chronicles.[479]

During the late 1680s Newton developed a similar stance towards particular passages from the New Testament, in particular 1 John 5:7-8 and 1 Timothy 3:16. In his Letter to 'a Friend', that is, John Locke, he exposed these passages as later insertions, deployed to defend the dogma of the Trinity. Comparing all versions of the texts he had available in Greek, Latin, and several other languages, and the writings of the Church Fathers, he attempted to reconstruct the passages as they were before they were tampered with.[480] Elsewhere, Newton argued

[478] Yahuda Mss. 10b, fols. 11^{r-v} and 25.1c, fol. 6^{r}.

[479] *Observations*, 8; Yahuda Mss. 7.3i, fol. 5^{r-v}, and 8.1, fol. 6^{r}. See also R. Popkin, 'Newton as a Bible Scholar', in *ECNI*, 103-18, esp. 103-06. For Ezra as the compiler of various books of the Old Testament, see also N. Malcolm, 'Hobbes, Ezra, and the Bible: The History of a Subversive Idea', in id., *Aspects of Hobbes* (Oxford, 2002), 383-431. See also B. Bravo, '*Critice* in the Sixteenth and Seventeenth Centuries and the Rise of the Notion of Historical Criticism', in C.R. Ligota and J.-L. Quantin, *History of Scholarship: A Selection of Papers from the Seminar on the History of Scholarship Held Annually at the Warburg Institute* (Oxford, 2006), 135-95, esp. 185-88; Greenham, *Concord*, 111-14.

[480] See in particular R. Iliffe, 'Friendly criticism: Richard Simon, John Locke, Isaac Newton and the Johannine comma', in Hessayon and Keene, *Scripture and Scholarship*, 137-57. See also J.A.I. Champion, ''Acceptable to inquisitive men': Some Simonian Contexts for Newton's Biblical Criticism,

that the authorship of some of the epistles in the New Testament were debatable; for instance, the second letter of Peter had clearly been written by someone else.[481] This did not mean that all parts of Scripture were equally fallible. In particular the prophecies were given directly to the prophets, and could thus be relied upon, which, as I will discuss next, was exactly what Newton did.

4.5 Sacred history

It has been argued that Newton's chronological project should be considered a secular universal history, in which Newton at some point started to incorporate sacred chronology, most of which he subsequently discarded.[482] The argument is substantiated by the presence of chapter headings among the drafts that did not return as such in the *Chronology*, such as 'Chronology of the Gospel', 'The Chronology of the Books of Ezra & Nehemiah', and 'Of the sacred History of the Persian Empire'. However, in the *Chronology*, sacred chronology – or rather, *historia sacra* – played a dominant role, in particular in the chapters on the Assyrians, the Babylonians, the Persians, and the Medes. These were not just historical chronologies, but directly connected to the events foretold in the prophecies, in particular the visions of the statue and the four animals in Daniel.

4.5.1 Intrinsically connected

As we have seen with the reconstruction of the 'Originals' in Chapter 3, Newton's research into the origins of religion and idolatry was intrinsically connected with his studies of the rise

1680–1692', in *CNI*, 76-96; id., 'Pere Richard Simon; Greenham, *Concord*, 114-20; Mandelbrote, 'Eighteenth-century Christianity', 571-73.

[481] Yahuda Ms. 9.2, fols. 140^{r}-141^{r}.

[482] R. Markley, 'Newton, Corruption, and the Tradition of Universal History', in *CNI*, 121-43; *Orig. of Civ.*, 209; J. Gascoigne, ''The Wisdom of the Egyptians' and the Secularisation of History in the Age of Newton', in S. Gaukroger, *The Uses of Antiquity: The Scientific Revolution and the Classical Tradition* (Dordrecht, 1991), 171-212, esp. 195.

of kingdoms. The 'Original of Monarchies' and the 'Original of Religions' were subsequent chapters of one and the same treatise, connecting both topics. In fact, in one early draft, Newton began the chapter on the origins of monarchies with the explicit statement that '[b]y the ~~rise~~ \original/ of Kingdoms might be understood y^{e} original of Temples', drawing direct lines between religion and society.[483] This is echoed in a passage from the *Chronology*: having discussed the temples built by Sesostris, Newton remarked that '[t]his was not the first original of Idolatry, but only the erecting of much more sumptuous Temples than formerly to the founders of new Kingdoms.'[484] Moreover, had Newton ventured to publish a secular volume, his description of the Temple of Solomon, if included at all, would have focussed on its actual and detailed description in the books of Kings and elsewhere. Instead, it is clear that the Temple described in so much detail in the fifth chapter of the *Chronology* is not that of Solomon, but a composite construct primarily based on the visions of the prophet Ezekiel, as the abundant references to those visions, and Newton's own commentary, show.[485] In fact, Newton's studies of the Temple were never meant to reconstruct the edifice as it had been built originally, but to provide a full description of the Temple in the context of its role in the book of Revelation, where it is the scene in which all Apocalyptic visions are set. The fact that these visions neither referred to the Second Temple, built after the Babylonian captivity under Zerubbabel, is clear from their mention of the Ark of the Covenant, which never returned to Jerusalem.[486] The inclusion of a detailed description of the Temple in the *Chronology* then seems connected with its historical *and* future significance. On the one hand, Newton considered the temple built by Solomon to be the first grand temple, on a much larger scale

[483] Yahuda 16.2, fol. 23^{v}.
[484] *Chronology*, 220.
[485] Ibid., 334-46, esp. 343.
[486] Yahuda Ms. See CUL Ms. Add. 3987, fol. 97^{r}-103^{r}; Yahuda Mss. 2.4 and 14; Babson Ms. 434; ASC Ms. N47 HER, fols. 35-40. See also Delgado-Moreira, *Epistemological and rhetorical strategies*, 110-57 and id., 'Newton as a Temple Scholar', 153-70; Goldish, *Judaism*, 86-107; C. Morano, *Isaac Newton: El Templo de Salomón* (Madrid, 1996); J.A. Bennett and S. Mandelbrote*, The garden, the ark, the tower, the temple: biblical metaphors of knowledge in early modern Europe* (Oxford, 1998), 154-55.

than any temples until then, thus providing an important chronological marker.[487] On the other hand, until the very last drafts for the *Chronology*, Newton had not planned to include a description of the Temple at all, let alone an entire chapter with overtly prophetical connotations. He even provided the full text of Ezekiel 40:5-23, collated from the Masoretic Hebrew text and the Septuagint, describing the Outer Court of the Temple. What Newton exactly intended with this passage is unclear, as he left the chapter unfinished, but it is the scene of one of the most important prophecies in the book of Revelation, that of the two witnesses. As Iliffe has shown, Newton identified these two witnesses with two groups of saints who would be saved, whereas the Outer Court would be 'given unto the Gentiles' and destroyed.[488]

In fact, many of the incomplete draft sections found under 'Of the sacred history of the Persian Empire' and the surrounding chapters, with even more 'sacred' titles like 'The Book of Ezra', return in Chapter 6 of the *Chronology*, 'Of the Empire of the Persians'. These intermediate chapter headings provide vital information about the purpose of Newton's chronological writings. Indeed, it seems he did change the structure of the *Chronology* dramatically, just before he died. In the early days of its gestation, the *Chronology* consisted of the chapters on the emergence of religion and monarchies, and several chapters dealing with the various Egyptian kingdoms at Thebes and Memphis, and the Phoenician colonies, just like the 'Originals'.[489] The Assyrian, Persian, and Median empires were originally only discussed – briefly – in the 'Original of Monarchies', which would evolve into the first chapter of the *Chronology*; Babylon was only mentioned as a city and not yet as a separate kingdom. At some point, Newton decided to devote full chapters to these four empires, in configurations he kept changing until the very end. In one early draft, he simply replaced the chapter header 'Original of Monarchies' with 'Of the Assyrian, Babylonian \Chaldean/ & Persian Monarchies',

[487] *Chronology*, 220-21; see also *Orig. of Civ.*, 427.
[488] *Priest*, 223-32, 249-52; the passage is from Revelations 11:2, KJV.
[489] Yahuda Mss. 25.1e, fols. 1^{r}-2^{r}, 3^{r} ff; 25.1f, fols. 1^{r}-3^{v}, 10^{r}-14^{r}, 15^{r}-29^{v}; 25.2a, fols. 1^{r}-34^{v}; 25.2b, fols. 1^{r}-3^{v}, 4^{r}-5^{v}, 6^{r}-9^{v}, 18^{r}-38^{v}; 25.2c, fols. 1^{r}-8^{v}.

now preceded by a new first chapter.[490] Whereas the published *Chronology* contains a chapter 'Of the two Contemporary Empires of the Babylonians and Medes', in the final draft Newton discussed the Medes together with the Persians *and* separately from them – there are two different chapters – although the binder now at the beginning of the manuscript lists distinct chapters for the Babylonians, Persians, and Medes.[491] A close reading of these chapters shows that Newton was still coming to grips with the exact chronology of these empires when he died in 1727. This would also explain the slight discrepancies in Newton's interpretation of the statue in Nebuchadnezzar's dream and the four animals found in the *Observations*, which occur in different sections brought together by its posthumous editors, as I will discuss in Chapter 5.

4.5.2 The prophecies revisited

A close inspection of the earlier versions of the chapters on the Empires of Babylon, the Medes, and the Persians reveals how they all relate to the Scriptures, and in particular to the prophecies in Daniel. Most have titles that either compare with or build upon sacred chronology, such as 'Of the History of the Iews in the reign of Cyrus & Cambyses. /& Darius Hystaspis\', 'The history \& chronology/ of the ~~two first~~ \Babylonian/ monarchi|y|~~es~~ with respect to y^{e} ~~Iews \70 years captivity of/~~ /the Iews.\', 'Of the Kingdom of Elam', 'The history & Chronology of the Persian Monarchy with respect to the Iews', or 'The Chronology of the Books of Ezra & Nehemiah wth respect to y^{e} Persian Monarchy'.[492] All of these chapters predate the drafts related to the *Chronology*. As an example, take his discussion of the Assyrian empire. In the Keynes 'Original of Monarchies', Newton attempted to show that in the days of its legendary founder Nimrod or Ninus, Assyria was still a collection of small city states. At the time of writing, he might have already considered – or even begun – a separate chapter, as he wrote 'For I \shal/ shew ~~else where~~ \presently/ that the famous Assyrian

[490] NCL Ms. 361.3, fol. 186^{r}.
[491] CUL Ms. 3987, fols. 1^{r}, 104^{r}, 112^{r}.
[492] Yahuda Mss. 25.1c, fol. 1^{r}, and 25.1d, fols. 3^{r}, 5^{r}, 17^{r}; NCL Ms. 361.3, fols. 53^{r}, 54^{v}.

Monarchy grew up by conquest out of many small kingdoms long after those first ages…'. Building up his argument that the Assyrians only became a mighty empire in the eighth century BCE, Newton employed dozens of sources to stake his claim, initially all from sacred chronology. It was only after several pages that he introduced profane sources like Berosus, Abydenus, Polyhistor and Ptolemy, embedded in many more passages from Scripture.[493] The same is true for the earliest versions of the chapters on the Babylonians, Medes and Persians, invariably building on Biblical references.

More importantly, these draft chapters did not just rely on the historical narrative found in the chronological books in Scripture, but also on the prophecies. Newton often invoked the prophetical words of Isaiah and Ezekiel as historical proof, and likewise drew heavily on the prophecies in the book of Amos related to the Assyrian empire. This is unsurprising seeing how he emphasized the reliability of prophetical texts, being given to and written down directly by the prophets. Although he did not mention them by name, it was evident to Newton that Amos spoke about the Assyrians. Commenting upon a passage from Amos 6:14, 'But behold I will raise up against you a nation, o house of Israel, saith the Lord…', he wrote that the Lord 'conceales [that name] till y^{e} Assyrians should appear and [the Israelites] discover it.' He added that the words 'raise up' meant that the Assyrians had not yet become a mighty empire, but instead were 'a nation whom [the Israelites] yet feared not.'[494] That Amos spoke about the Assyrians was also confirmed by various other prophets: 'In the prophesies of Isaiah, Jeremiah, Ezekiel, Hosea, Micah, Nahum, Zephany & Zechary w^{ch} were written after this monarchy grew up, it's openly named upon all occasions.' The entire passage on Amos, included the quotations from Scripture, returned in the *Chronology* – verbatim – but now as an integral part of the chapter on the Assyrian Empire, thus rooted in Scripture.[495]

[493] Keynes Ms. 146, fols. 1^{r}-7^{r}, quoted from fol. 3^{r}.
[494] Ibid., fol. 5^{v}.
[495] *Chronology*, 271-72.

In the example above, Newton used several of the prophetical books for the historical information they contained, since many of the prophecies referred directly to actual political events. However, the final drafts for the *Chronology* contained many other passages from the prophecies, in particular those from the book of Daniel, used in a wholly different fashion. As I discussed earlier, when establishing the extent of the rule of Darius the Mede, Newton drew upon Herodotus, Xenophon, the poet Aeschylus, and other classical sources, but primarily upon sacred chronology. Having demonstrated that Darius, together with Cyrus the Persian, had conquered the Babylonians (or Chaldeans) and now reigned over both the Medes and the Persians, Newton quoted from one of the visions of Daniel:

> When therefor the Angel told Daniel that he would return to fight wth the king of Persia, for when he was gone forth the Prince of Greece he should come, & that in the first year of Darius he stood to confirm & to strengthen him: the meaning is that he had assisted Darius in warring against the Chaldeans & was in like manner to assist the king of Greece in warring against the Persians.[496]

Here Newton used the factual information provided in both sacred and classical chronology to interpret the meaning of a particular prophecy, exactly as he did in the *Observations* and all related materials.

Just as the concept of the four monarchies played a pivotal role in Newton's interpretations of the prophecies, so did it in his studies of ancient civilizations.[497] In the oldest draft for the 'Original of Monarchies', there is a passage that in ever-changing form would remain part of the 'Originals'. Having discussed how villages grew into cities, he continued 'And from these small beginnings kingdoms… have ever since (whether by war or compact) grown greater & greater & governments more & more compound untill y^{e} rise of y^{e} four Monarchies.'[498] This was followed by a description of the first great monarchy, Assyria, reputedly as old as the

[496] CUL Ms. 3987, fols. 104^{r}-111^{r}, cited from 110^{r}-111^{r}; the passage is from Dan. 10:20.
[497] See also Trompf, 'On Newtonian History', 231.
[498] Yahuda Ms. 25.1d, fol. 1^{v}, emph. mine; see also Yahuda Ms. 25.2f, fol. 29^{r}; Keynes Ms. 146, fol. 3^{r}; NCL Ms. 361.3., fol. 166^{r}.

legendary Ninus or Nimrod, which age, as Newton immediately added, rested only upon the authority of Ctesias. As I discussed earlier, Newton found many faults with the fifth century BCE Greek historian's account of Assyria when comparing it to Herodotus and the record found in Scriptures, arguing it had to be much more recent than Ctesias had claimed.[499] In another passage, which first occurred under the heading 'Of the Original of Kingdoms' in inserted fragments found in the 'Origines', Newton once more discussed the primacy of Egypt. He strongly argued that Assyria had only become a powerful monarchy after the days of Homer, whom he situated in the second half of the 9th century BCE, since Homer was all but silent on Nineveh and Babylon, yet devoted ample attention to Thebes.[500] He later rephrased this, the passage now commencing 'One of the first great kingdoms…' and adding references to Pliny and Strabo, which is also how it appeared in the Keynes 'Original of Monarchies'.[501] What did not return in the later version was how Newton originally summed up his discussion: 'I have now given an account of the rise of the four Monarchies…' which included the first twelve pages of the Keynes 'Original'.[502]

From these two examples, it appears that the 'Original of Monarchies' did not just refer to monarchies in general, but specifically to the four monarchies described in the prophecies of Daniel. This becomes even clearer from a chapter that is now part of the manuscript from which the *Observations upon the Prophecies of Daniel and the Apocalypse of St John* was printed. It is easily overlooked, because the compilers of the volume rather rigorously edited the various manuscripts and in this particular case changed the chapter title. In the printed chronology, the chapter returned as 'Chapt. X Of the Prophecy of the seventy Weeks';

[499] *Chronology*, 265-70.
[500] Yahuda Ms. 25.2f, fols. 45^{r}-46^{r}; see also Yahuda Ms. 16.2, fol. 23^{v}. For Newton's dating of Homer, see *Chronology*, 32.
[501] Yahuda Ms. 25.2f, fols. 46^{r}-47^{r}; see also Keynes Ms. 146, fol. 26^{r}; Yahuda Ms. 25.1e, fol. 1^{r}, 3^{r}.
[502] Yahuda Ms. 25.2f, fol. 45^{r}.

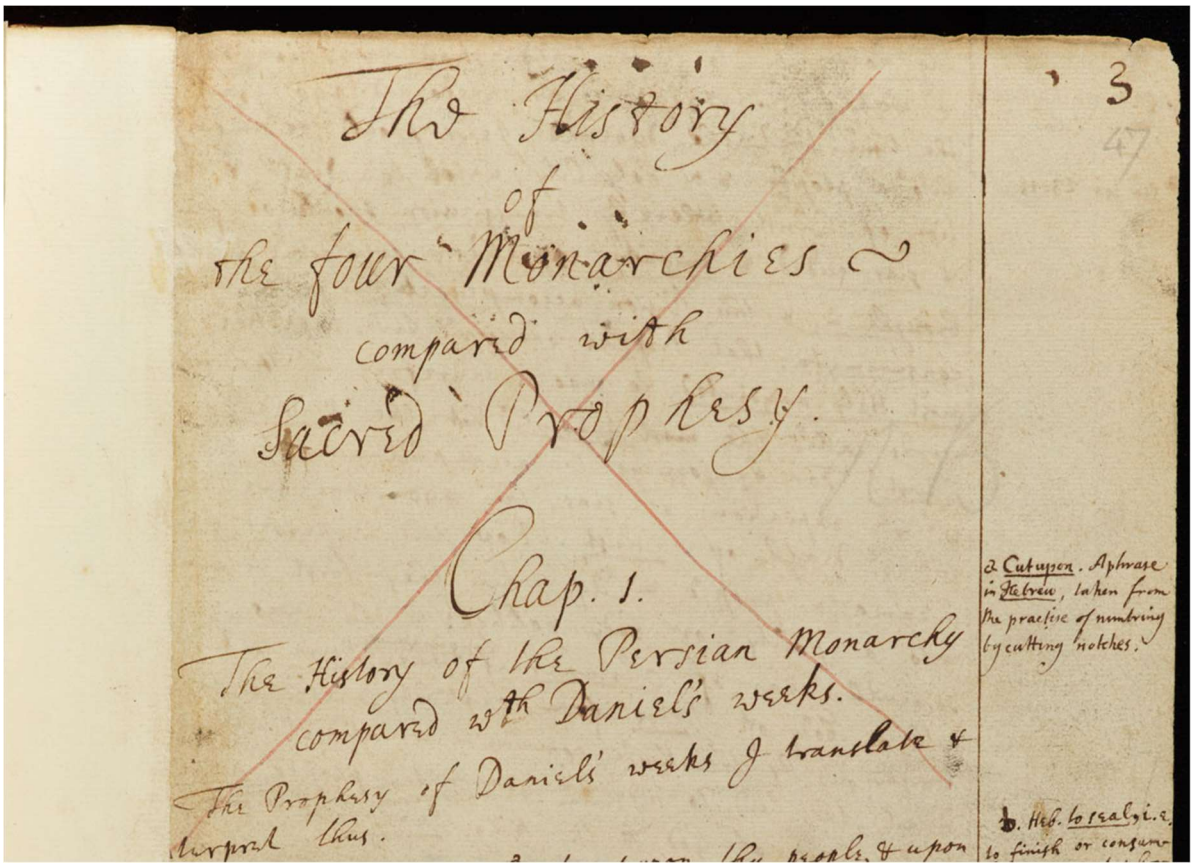


Figure 24. Newton's overall title and that of the first chapter for a work in which he examined the four monarchies from Daniel in the light of the prophecies. CUL Ms. 3987, fol. 47^{r}.

however, the original chapter title read 'Chap. 1 The History of the Persian Monarchy compared wth Daniel's weeks'. Moreover, it also bore the title for an entire work, 'The History of the Four Monarchies compared with Sacred Prophecy'; see **Figure 24**.[503] It is evident that Newton's discussion of the four monarchies had always been in the light of the prophecies in Scripture. Initially, Newton might have even considered that the four monarchies from Daniel had been the only true monarchies, as Melanchthon and Sleidan had argued. In one of his earliest treatments of the Egyptian empire forged by Sesostris, he argued that it dissolved rapidly and thus lacked the qualities of the four monarchies that followed.[504] But, as the passage referring to Homer shows, around the time of the 'Originals' he had changed his mind

[503] *Observations*, 128; CUL Ms. Add. 3989, fols. 46^{r}-47^{r}.
[504] Yahuda Ms. 16.2, fol. 23^{v}; see also *Orig. of Civ.*, 207.

and referred to Egypt as the first great kingdom, although he significantly reduced its age to fit the timespan allotted by sacred chronology.

4.5.3 The longevity of the four monarchies

It appears, then, that Newton's main purpose in studying chronology – and writing, first, the 'Originals', and then, the *Chronology* – was to understand the prophecies found in Daniel and those in the Apocalypse. In other words, Newton did not write chronology for chronology's sake, to write a universal history of sorts, but instead as prerequisite for what really mattered: an informed understanding of God's plan for mankind. To correctly understand how the prophecies related to events past and present, Newton needed a methodological key: his 'rules for methodising | construing the apocalypse'. What he also needed was a reliable history onto which to map these prophecies, because the existing historiographical framework did not suffice. This becomes clear from the scribal version of the 'Originals', where he began the untitled Chapter 2 with: 'For *better understanding* the ancient state of the Nations and *how the four monarchies arose*, *the Chronology of those times is to be rectified.* That of the Oriental Nations is stated by the Scripture, the Annals of the Phoenicians and the Æra of Nabonassar, but that of the Greeks and Latines is very *uncertain*...'[505] With the Oriental nations, Newton obviously meant those represented by the first and second animal from the visions of Daniel, while the Greeks and Latins referred to Alexander the Great and the Roman Empire. The word Newton used to describe their chronology, uncertain, returned in the introduction to the *Short Chronicle*, and indeed the *Chronology*: '...how *uncertain* their chronology is, & how doubtful it was reputed by the Greeks of those times… And as for the chronology of the Latines that is still more *uncertain*.'[506] These were no proper foundations upon which to build his prophetical scheme.

[505] Yahuda 25.2f, fol. 39^{v}, emph. mine.
[506] *Chronology*, 3-5 and 48-49.

Then again, if Newton did not write a chronology per se, why did he insist on getting all the details about the first three empires right? Was it not much more important to focus on the signs of the times, and thus on the fourth animal and its continuation in the Holy Roman Empire? However, contrary to the interpretations found in the works of his predecessors which I discussed in Chapter 1, Newton considered all four animals – and thus empires – still very much alive. This was a direct consequence of his insistence that both of the visions from Daniel, that of the statue and that of the four animals, referred to the same prophecy. As Newton explained: '...all y^{e} four parts of Nebuchadnezzars Image continue till y^{e} end & then by y^{e} stone smiting y^{e} Image upon \its/ feet are all of them together (y^{e} Gold & y^{e} silver & y^{e} brass & y^{e} Iron) broken in pieces & dispersed, & in y^{e} interpretation thereof y^{e} stone is said to be a kingdom w^{ch} shall break in pieces all those kingdoms signifyed by y^{e} Image, & so y^{e} four Beasts continue till y^{e} fourth be cast into burning flames & then have their lives prolonged…'[507] Although the original monarchies had lost their power, they still lived on – after a fashion – in their successor nations: 'The four Monarchies are still in being & the \four/ Beasts representing them are still alive,' Newton insisted, '[a]nd since… John's prophesy was given by the same Holy Ghost with Daniels & is full of Allusions to the Prophecies of the old testament: we may expect to find Daniel's Monarchies in John's prophecy so far as they relate to the Christian religion.'[508] Thus, the study of the four monarchies had direct relevance to understanding the Christian religion. In order to find these monarchies, Newton employed a similar synchronistic method to the one he had used for interpreting both visions in Daniel, which all related to the same prophecy, and with the trumpets and vials in Revelation: 'All the descriptions of one & the same thing must be conjoyned that they may interpret one another; & supply one another's defects, & joyntly make one complete description w^{ch} cannot be misapplyed.' He thus identified various images from the Apocalypse with those in Daniel, including that of the beast in

[507] Yahuda Ms. 9.2, fol. 112^{r}.

[508] Yahuda Ms. 7.2j, fol. 23^{r}-24^{r}. See also *Chronology*, 276, '...the three first of the four Beasts had their lives prolonged after their dominion was taken away…' Yahuda Mss. 7.1i, fol. 11^{r}; 7.2a, fol. 25^{r}; 7.2j, fols. 11^{r}, 128^{r}; 10b, fol. 3^{v}.

Revelation 13 which had seven heads and ten horns, which he equated with the fourth animal in Daniel, thus representing the Roman Empire and its continuation.[509]

All the while, Newton referred to his own hermeneutical rules, opting for those interpretations which 'reduce[d] the parts of scripture to the greatest consent and harmony.'[510] Eventually, he concluded that the nations that made up the four monarchies had survived in three parts: the various nations beyond the river Euphrates, represented by the first two beasts of Daniel; which became the Islamic Empire; the nations of the Byzantine Empire; and those of the Western Roman Empire. This threefold division then corresponded with the various prophecies in the book of Revelation where reference was made to a third part of the earth; together, these three parts formed 'the whole scene of sacred Prophecy'. [511] Grouping the nations covered by the first two animals also meant that their exact configuration became less important, as long as it was clear what ancient and thus modern nations were included. According to Newton, the period of 1260 years had begun in 800 CE when Charlemagne conquered Germany, thus uniting all of what from that moment onward would be the Holy Roman Empire. As Newton put it, 'When Charles the great conquered Germany he propagated the Roman religion into all his conquests… and from that time forward all Germany became a part of the Whore's Beast…', referring both to the fourth animal in the vision of Daniel and its apocalyptic counterpart.[512] Adding 1260 years to 800 CE when 'the complete conquest of the three kings' had been obtained, resulted in the year 2060 for Christ's return.[513] As it would take too much space to go into all the details of Newton's exegesis of the prophecies in Scripture, such as his idiosyncratic identification of the whore of Babylon and its explicit antitrinitarianism, I refer the reader to the elaborate treatment provided by Iliffe.[514]

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[509] Yahuda Ms. 7.3i, fol. 25^{v}.
[510] Ibid., fol. 24^{r}.
[511] Ibid., fol. 25^{r}, *Chronology*, 276 (quoted). See also Yahuda Ms. 7.2j, fols. 23^{r} and 40^{r}; Keynes Ms. 5, fol. 29^{r} ff.
[512] Yahuda 7.3i, fol. 25^{v}; see also *Chronology*, 53.
[513] Yahuda 7.3g, fol. 13^{v}; see also Mandelbrote, 'Exegesis', 355.
[514] See *Priest*, 219-314.

4.5.4 Moving chapters

Although Newton wrote the 'Theologiae Gentilis Origines Philosophicae' and the 'Originals' against the background of the four monarchies that played such an important role in understanding past, present, and future, the full integration of his chronological studies only happened later. As I explained above, the 'Originals' contained chapters on the various Egyptian and Greek kingdoms, but mentioned the Assyrian, Babylonian, Median and Persian monarchies only in passing. It is in the *Chronology of Ancient Kingdoms Amended*, and its preliminary drafts, that Newton devoted full chapters to each of these realms. From the materials I discussed above, it is clear that Newton's quest to correctly establish the chronology of the kings that reigned over Babylon was directly connected to the prophecies from Daniel. This becomes even more apparent from the various configurations he entertained for these materials. In one of the earliest drafts, he included the following chapter outline:

> The Prophecies in the Book of Daniel
>
> Chap 1 The chronology of the kings of Babylon, and the seventy years captivity
>
> Chap 2 The chronology of the books of Ezra and Nehemiah
>
> Chap 3 Explanation of the vision of the seventy weeks
>
> Chap 4 Explanation of the vision of the four animals
>
> Chap 5 Explanation of the vision of the ram and the goat
>
> Chap 6 Explanation of the vision of the scripture of truth[515]

It appears Newton originally set out to write a separate treatise on the book of Daniel, perhaps inspired by the work of Henry More. As Iliffe has shown, More and Newton – who were and remained good friends – vigorously debated the exact interpretation of the symbolism in the book of Revelation during the end of the 1670s and early 1680s.[516] More's subsequent

[515] 'De Prophetijs Danielis Liber. Cap 1 Chronologia Regum Babyloniae, & Captivitatis 70 annorū. Cap 2 Chronologia Librorum Ezrae & Nehemiae. Cap 3 Expositio visionis Hebdomadum septuaginta. Cap 4 Expositio Visionis quatuor Bestiarum. Cap 5 Espositio [sic] visionis Arietis & Hirci. Cap 6 Expositio visionis de scriptura veritatis.' Yahuda Ms. 10b, fol. 10^{r}. See also Yahuda Ms. 7.3i, fol. 4^{v}.
[516] *Priest*, 252-59.

publication on the prophecies in Daniel left much to be desired in terms of historical accuracy, or for that matter historical research. Yet the visions in Daniel were directly related to the history of the period and of the centuries to follow, and thus could, and should, be mapped onto a historical timeline in order to fully understand their historical and future meaning. In the outline above, the 'scripture of truth' referred to Daniel 10:21, where the prophet was visited by an angel who explained to him the events of the coming centuries. In other chapter outlines, Newton included the older and younger Ezras and Nehemiahs, the building of the Temple, and the various time periods that featured in the book of Daniel.[517] The chapter headings I discussed earlier, which connected the chronology of the Persian Empire with the books of Ezra and Nehemiah, date from a later time when Newton had discarded the Jewish chronicles and established that there had only been one Ezra, the scribe, and one Nehemiah, governor over Judea.

Eventually, at some point in his research, Newton began to merge the materials from the 'Originals' with his prophecy-related chronology, which together became the *Chronology of Ancient Kingdoms Amended*. The 'Originals' contained the roots of the large introductory chapter from the *Chronology* which focussed on the Greeks and Latins, of the chapter on Egypt, which soon developed into a separate chapter, and of the chapter on Assyria. The latter then developed partially out of the 'Original of Monarchies', and partially out of Newton's studies of the chronology of the captivity. It is from this second project that the chapters on the monarchies of Babylon, Persia, and Media emerged, of which the oldest drafts date from the early 1680s, preceding, or co-written, with the 'Origines'.[518] Exactly when Newton combined both projects is not entirely clear. As I discussed earlier, the *Short Chronicle* he drew up in 1717 contained clear references to the prophetical project. Newton introduced the Assyrian empire with the words 'In Sacred History…', and Ezra, Nehemiah, and the various kings of the Babylonian, Persian, and Median empires were all included in his timeline.[519] Likewise, in

[517] Ibid., 7^{r} and 12^{v}.
[518] This includes ASC Ms. N47 HER, which is dated as c. early 1680s, and Yahuda Ms. 10b.
[519] *Chronology*, 5 ff.

another projected outline for his volume on the prophecies in Daniel, Newton made preparations to calibrate his prophetical timeline with Greek history: 'The 7th year of Artaxerxes [Longimanus] fell in wth ye year of ye Olympiad', leaving spaces to fill in the precise details. This shows that by then he had begun integrating the results of his studies of the prophecies in Daniel in the timeline he established in the 'Originals'. Notably absent in the *Short Chronicle* were the third and fourth monarchies: the timeline ended with the conquest of the Persian Empire by Alexander the Great, although there are references to events such as the foundation of Rome and the Peloponnesian War. But in one of the drafts for his timeline Newton added various other events, including the division of Alexander's realm among four of his generals, and the moment when the Roman Empire succeeded the Greek.[520] From the presence of draft materials for the second edition of *Opticks*, the page can reliably be dated as written in around 1717, thus showing how Newton indeed briefly entertained the idea of including a much more expansive timeline.[521]

Yet he soon decided to use the fall of the Persian Empire as a cut-off date. Perhaps he had not yet worked out a detailed chronology for the events that occurred after 331 BCE, as his drafts contain only a handful of younger dates. However, there is evidence that Newton intended to have his chronological work followed by his writings on the prophecies of Daniel and the Apocalypse, which would be a suitable place to include the chronology of the third and fourth monarchies. The first volume would then establish the proper timeframe in which to embed the history of all these monarchies, and answer questions about the primacy of Egypt and the age of the Assyrian monarchy. This would also explain why he removed most of his research on the monarchies of Assyria, Babylon, Persia, and Media from his prophetical studies and incorporated these materials in the *Chronology of Ancient Kingdoms Amended*.

[520] NCL Ms. 361.1, fol. 6r; see also fols. 30r, 83v,

[521] On the adjacent page is an incomplete draft for a query second edition of *Opticks*; the text of the draft is word for word the same as the published version. NCL Ms. 361.1, fol. 5v; I. Newton, *Opticks* (2nd edition, London, 1717), 350; see also CUL Ms. Add. 3970.3, fols. 259r and 272r-273r.

At the very last moment, Newton decided to make fundamental changes to the *Chronology*, as a comparison of the final draft and the manuscript from which the work was printed shows. He removed most of the passages referring directly to the prophecies in Daniel and switched the entire chapter on the Medes with the section on the Temple included with his discussion of the Babylonian Empire. In the first chapter, apart from some minor passage shuffling, the most dramatic change was the transfer of the text from the first nine pages to almost halfway. Originally, Newton began the *Chronology* with a discussion of the different calendars that were in use among the Greeks, Egyptians, and Israelites. He subsequently detailed how the beginning of the lunisolar year, the year as determined by both sun and moon, shifted due to the precession of the equinoxes, in which the Earth's rotational axis slowly changes its orientation. As a result, ancient astronomers such as Eudoxus, Meton, Thales, and Hipparchus, had all placed the solstices and equinoxes in different parts of the constellations. What followed were the astronomical data from which he attempted to date the Argonautic Expedition, as I discussed in Chapter 3. Having established that Jason and his crew sailed out in 937 BCE, and that Troy fell a generation later, in 904 BCE, Newton returned to the materials he composed for the 'Original of Monarchies'. He discussed the uncertainty of Greek chronology, and that of various European nations, which he all put down to the absence of writing. For how could oral history be reliable? As he put it in a draft, '...how come [these ancient historians] to know this? Could the history of Athens be preserved for 500 years together wthout the use of Letters? \Or could Sicyon & Germany remember their Originalls [after] five hundred [years?]/… We find by dayly experience that the memory of such things as are not committed to writing, wears out in thre or four generations...' It is only after his discussion of the reliability of ancient testimony that he wrote that 'All nations before they began to keep exact accounts of time, have been prone to raise their antiquities…' followed by his calculations of the average reigns of kings.[522]

[522] CUL Ms. Add. 3987, fols. 1^{r}-16^{r}; NCL Ms. 361.3, fol. 256^{r}.

However, in the *Chronology*, Newton had moved this passage to the front. His introduction now began with the uncertainty of Greek chronology, supported by quotations from authoritative sources such as Plutarch and Herodotus, and included several examples where ancient historians were clearly wrong. This included his discussion about the exact dates for Lycurgus, a key example to show how unreliable Greek history was. Alas, as I have shown in § 2.2.3, the 1589 Latin translation of Thucydides on which Newton relied, proved to be equally unreliable, undermining much of his argument. In between Newton had sandwiched his regnal calculations, as additional evidence. The astronomical section had now become secondary, adding to what he had already established through genealogical means and the average length of generations and reigns. The reasons for this change of tactics must be sought in the response Newton received after the pirated translation of the *Short Chronicle* was published, in autumn 1725. Nicholas Fréret, his main critic, took exception to Newton's regnal calculations, but in particular to his interpretation of ancient astronomy. On his turn, Newton, upset about the illegally published abstract, was unimpressed with Fréret's response, as he had made several incorrect assumptions about how Newton had performed his astronomical calculations. '[T]he observator hath mistaken my meaning... and hath undertaken to translate and to confute a paper which he did not understand, and been zealous to print it without my consent; tho he thought it good for nothing, but to get himself a little credit, by translating it to be confuted, and confuting his own translation.' Exposing Fréret's errors, he suggested that the Frenchmen should first 'rectify his [own] mistake[s]'.[523] However, in response to this exchange, Newton might have considered that of the two foundations of his revised chronology, the genealogical argument should be placed first, as it also rested on the authority of Plutarch and Herodotus, two authors he held in high esteem.

As Newton explicitly mentioned at the end of the chapter on the Persians and the Medes from the final draft for the *Chronology*, he originally meant to continue with a short account of the chronology of the Persians, Greeks and Latins as found in the book of Daniel, who wrote 'with

[523] Newton, *Remarks*, 318.

more understanding then any profane writer ever did.'[524] After all, Daniel was a prophet, and the prophetic history he provided was divinely inspired. And indeed, among the drafts there is a chapter with exactly the same layout as the final draft, titled 'An Account of the Empires of \the/ Babylonians, Medes Persians Greeks & Romans according to the descriptions given of them by Daniel', to which Newton shortly after prefixed: 'Chap. VII.'[525] Underneath this deleted section, Newton's executor John Conduitt wrote that 'This is a proof that he intended his prophecies as a sequel to the Chronology.' The second half of the volume would then have included the Macedonian and Roman Empires, with their continuation, Newton's rules for methodizing the Apocalypse, and the subsequent interpretation of the prophecies in Daniel and the book of Revelation. It might even be that Newton intended a third volume, on ecclesiastical history, titled *Of the Church*, with particular emphasis on the events of the fourth century. Both the emergence of Trinitarianism and the Roman Catholic Church were movements Newton understood in the light of the corruption of the true religion and the rise of Antichrist. These three volumes would then connect chronology, prophecy, and ecclesiastical history – although, as I have shown throughout this chapter, they had never been far removed from each other.[526]

4.6 Conclusion

What has become evident throughout this chapter is that Newton pursued chronology to support his studies of the prophecies. It was the duty of all men to read the signs of the times, and thus Newton developed a detailed hermeneutic framework to correctly interpret the prophecies in the books of Daniel and Revelation. In the 'Theologiae Gentilis Origines

[524] CUL Ms. Add. 3987, fol. 123^{r}.
[525] Yahuda Ms. 7.1d, fols. 4^{r}-24^{v}, 27^{r}-31^{v}; see also id., fols. 1^{r}-3^{v} for an earlier draft of fols. 4^{r}-7^{v}.
[526] Stephen Snobelen suggests another continuity between Newton's chronological and ecclesiastical studies, in that the chapter on the Temple returns in his writings on the Church; S. Snobelen, 'Isaac Newton, Historian: Redivivus', *Isis*, 106 (2015), 880-88, esp. 888; but then, the Temple materials were only added to the *Chronology* at a very late stage.

Philosophicae', he first employed chronology to identify the origins of idolatry, which played a pivotal and disastrous role in *historia sacra*. It had led to the Assyrian and Babylonian captivities, from which only a remnant returned; and it had resulted in the rise of the unholy Roman Empire and Antichrist, the papacy. In the 'Originals', which became the *Chronology*, Newton developed a temporal framework from sacred history, which he subsequently used to include the relevant profane histories, those related to the four monarchies in the prophecies from Daniel. In order to correctly interpret these prophecies, he collated the chronology found in Scriptures with those from other sources, not shunning to reorder or amend Biblical passages when required. Sacred chronology had always been an integral part of Newton's chronological writings, and in particular of his history of the monarchies of Assyria, Babylon, Media, and Persia. The full chapters he eventually composed for the *Chronology* were not conceived as offshoots from the 'Original of Monarchies', but rather emerged from his studies of the prophecies.

During his final years, Newton seems to have focussed on the *Chronology* as a stand-alone volume – for the time being. He had ample reason to do so, with the French 'inquisition' – Fréret, Souciet, and their colleagues – eagerly awaiting his next move, and the urge to defend himself from their accusations of sloppy chronology. In order to do so, he moved forward several sections from the introduction to explain his methodology straightaway, and indeed removed several passages with overtly prophetical connotations. However, the manuscript which he eventually transformed still bore all the connecting elements that he originally preserved, including the paragraph annotated by John Conduitt. Therefore, we should not judge Newton's *Chronology* by its cover, that is, by its final iteration, as modern historians have done so often. Newton's contemporaries had only the published work to inform their opinion, but twenty-first century historians must take into account the full wealth of draft writings.

This then leaves the question, what it was exactly that Newton was doing. How should we classify the *Chronology*, or rather, the chronological project he was working on around 1717?

It seems clear that Newton was not writing a universal history of the Melanchthonian or Ussherian variety. His narrative began after the Flood, and quickly focused on reconstructing the chronology of Greece within the timeline allotted by Scripture. This then became a framework for the chronology of Egypt and Assyria, followed by the other monarchies described in the prophecies in Daniel. Moreover, Newton's chronology did not deal with God's ways with his chosen people, or the unfolding of his plan in history. As I have shown, in particular the first chapter of the *Chronology* still bore the vestiges of the 'Origines'; yet the *Chronology* was no longer a history of idolatry, nor did it try to establish the accuracy of the Scriptural record. On the contrary, as his studies of the history of the kings that ruled over Babylon progressed, Newton began to realise that the books of Scripture had not survived unscathed. He soon developed a rather nuanced literary criticism towards the structure of Ezra and Nehemiah, and towards the chronological information provided by the authors of the Old Testament in general. The historical events mentioned in Scripture were not wrong, but had often been inaccurately recorded, with the exception of those facts revealed directly by God to his prophets. The book of Daniel, then, in both its historical and prophetical elements, represented for Newton the most reliable chronology possible. All other sources, sacred or profane, had to be understood, and, where needed, amended, in order to provide an accurate context to understand God's hand in past, present, and future. As such, Newton's chronological writings were entirely subservient to his study and interpretation of the prophecies. He never pursued chronology for chronology's sake, but always as a means to an end, as Conduitt correctly surmised

5. Working with Newton

5.1 Introduction

For most of Isaac Newton's life and afterlife, his scholarly writings were kept out of public sight. When Thomas Pellet, FRS, inspected the manuscripts Newton had left after his death in 1727, he marked all but five as 'not fit to be printed', primarily because of their draft nature.[527] Apart from *Two Notable Corruptions in Scripture*, compiled of two letters Newton sent to John Locke in 1690 that dealt with the alleged later insertion of Trinitarian passages in the Bible, first published in 1754, and some excerpts of his theological writings by David Brewster in the mid-nineteenth century, his scholarly writings remained hidden. After the Sotheby's auction of 1936, it took until the 1960s before these writings became slowly available to a scholarly audience. Still, studies that take into account the majority of Newton's chronological and theological corpus remain scarce. Yet today, the availability of digital manuscript images, the *Newton Project*'s transcriptions, and rich online collections of primary sources such as *EEBO* and *Google Books*, allow us to study Newton's life and work in unparalleled depth and detail. How beneficial the application of these resources can be the reader has been able to verify from the research presented in this thesis. In the previous chapters, I have shown the results of this approach. In Chapter 2, I was able to delve deep into Newton's reading and note-taking practices, retracing his – sometimes obscure – sources and how he interpreted the materials found there. In Chapters 3 and 4, I reconstructed the evolution of Newton's chronological writings, from their humble beginnings as an unnamed ten-folio treatise to the hundreds of pages that eventually became the *Chronology of Ancient Kingdoms Amended*. Additionally, I also drew vital connections between his chronological studies and his writings on the prophecies, showing how with the *Chronology* Newton essentially combined two separate but related projects.

[527] *Never at Rest*, 872-73; Dry, *Newton Papers*, 11-13.

While Newton sought meaning in the writings of Scripture, scholars sought meaning in the writings of Newton. In this chapter I show how after Newton's death, various editors were involved with the publication of his chronological and prophetic studies. Both of these works, but in particular the latter, were amalgamations of chapters found amongst Newton's papers. Despite having the physical manuscripts in front of them, the editors had only limited time and access to these documents due to the nature of Newton's working practices, and their other obligations. Until the dawn of the digital age, students of Newton's scholarship were limited by the same constraints: availability, access, and time. However, the digitization of primary sources, including many of Newton's manuscripts, and the availability of transcriptions of his writings, has opened up new avenues of research that allow us to come closer to Newton than ever before. In the second half of this chapter I discuss how these changes have affected Newton scholarship by returning to some of the core conclusions from the previous chapters and the research methods involved. I show how it is exactly through these new methods that we can answer questions pertaining to both the minutiae of Newton's daily working practices, and to the larger dimensions of his chronological writings.

5.2 Editing and understanding

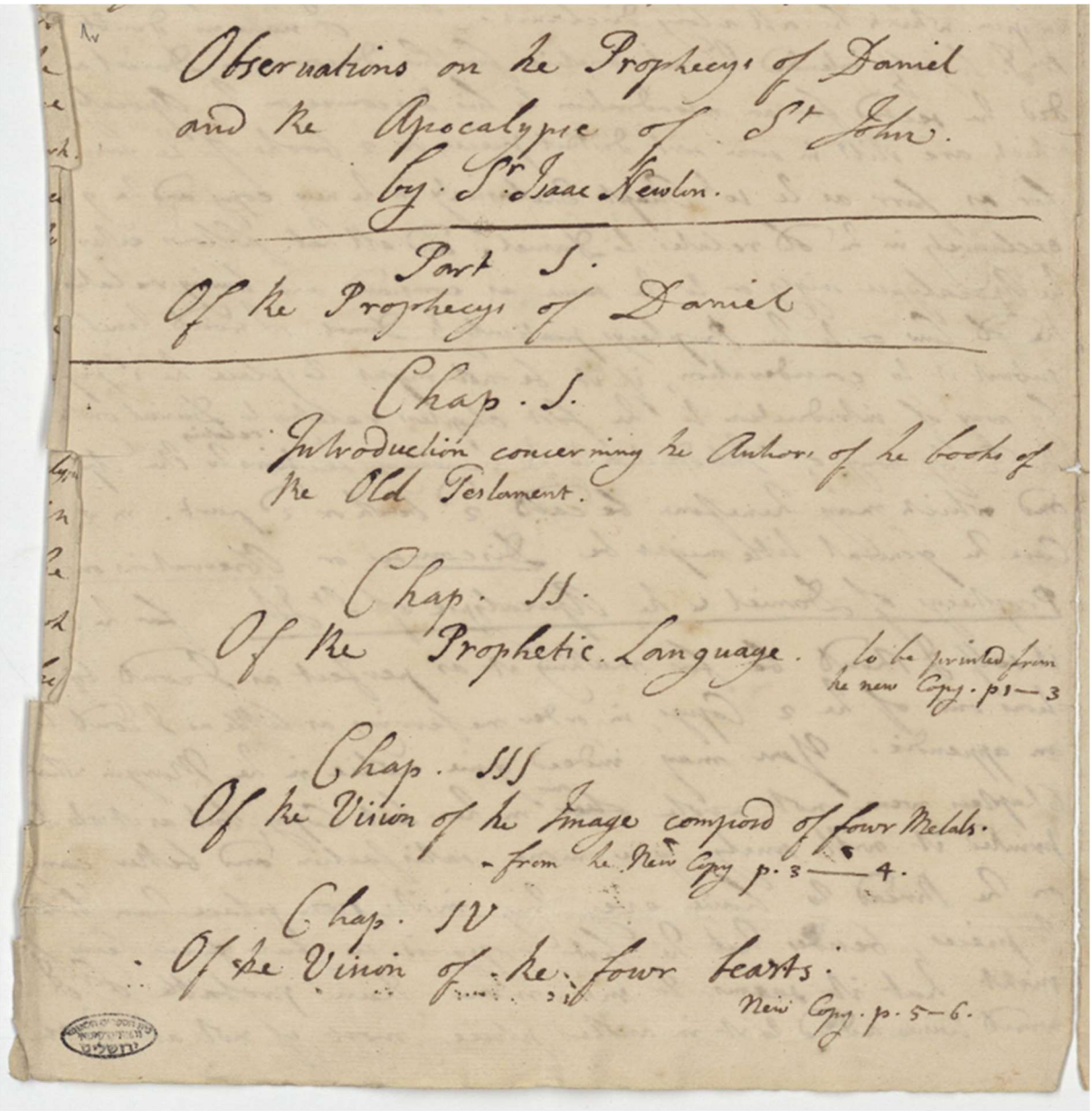
In early 1727, scholars in Britain and abroad were eagerly awaiting the full text of Newton's chronological studies. Up to that point they had to make do with the short introduction and timeline of dates and events that together constituted the *Short Chronicle*. Thus, when Newton passed away in March, his heirs eagerly desired that their uncle's work be published, primarily for financial motives. John and Catherine Conduitt were probably the exception to this venality, with John showing a genuine interest in Newton's scholarly writings. The editorial history of the resulting posthumous publications, the *Chronology of Ancient Kingdoms Amended* and the *Observations upon the Prophecies of Daniel and the Apocalypse of St John*, has so far remained unwritten. Yet it contains a fascinating tale of how Newton's friends, relatives, and

colleagues tried to piece together meaning from the thousands of manuscripts with which they were confronted. Benjamin Smith, the son of Newton's half-brother, also named Benjamin, is widely considered to have been responsible for the publication of Newton's *Observations upon the Prophecies*. Not much is known about Smith. 'A hellion who brooked no restrictions', as Westfall described him, he appeared a particularly troublesome character who eventually became a clergyman, ordained by William Stukeley. How and in what capacity he was actually involved with the *Observations* is unclear; since his name appeared under the dedication to Peter King, Baron of Ockham and a cousin of John Locke, historians have always assumed he must have contributed in one way or another. However, from the story that can be pieced together from notes dispersed all over the manuscript corpus, his contribution seems to have been rather marginal.[528]

5.2.1 The *Observations*: a tale of many hands

The *Observations* contains chapters taken from all over Newton's studies of the prophecies and the history of the church. Following a general introduction 'concerning the compilers of the Old Testament', the first part of the volume dealt with the prophecies from the book of Daniel. This included chapters on the statue from the dream of Nebuchadnezzar, the four animals, the ten horns and the little horn, but also on more obscure details such as two chapters on the honouring of 'mahuzzims', or, in Newton's words, 'the worship of the Images & souls of dead men', performed by Antichrist.[529] The second part included three chapters that dealt with the interpretation of the prophecies in Revelation, and how they related to the writings of the Old Testament. Clearly, not all of these textual elements had originally been intended by Newton to be chapters, with many bearing the word 'Section' in their draft title, subsequently elevated by the editors.

[528] *Never at Rest*, 857; see also 849, 858.
[529] *Observations*, 194-231; Yahuda Ms. 7.1n, fol. 9^{r}; see Dan. 11:36.


Observations on ye Prophecys of Daniel
and ye Apocalypse of St John.
by Sr Isaac Newton.

Part I.
Of ye Prophecys of Daniel

Chap. I.
Introduction concerning ye Authors of ye books of
ye Old Testament.

Chap. II.
Of ye Prophetic Language. to be printed from ye new Copy. p 1—3

Chap. III
Of ye Vision of ye Image compos'd of four Metals.
from ye New Copy p. 3—4.

Chap. IV
Of ye Vision of ye four beasts.
New Copy. p. 5—6.

Figure 25. Part of Martin Folkes's proposal for the *Observations*. Yahuda Ms. 7.2b, fol. 1^{v}.

In fact, little is known about the editorial history of the *Observations*. The existing narrative about Smith's involvement hinges solely on the short dedication that bears his name, but it seems highly unlikely that he played a major role in the editorial process. Instead, among Newton's prophecy-related drafts there are two series of folios with notes and suggestions relating to the publication of the work, containing five different hands – none of which seem to be Smith's. The first hand is that of Martin Folkes, the antiquarian; see the memo in **Figure 25**. Back in 1723, Folkes had been appointed by Newton as Vice-President of the Royal

Society, but it was Hans Sloane who would succeed Newton in the chair.[530] In the memo, Folkes proposed the two-part scheme that was eventually adopted, and also suggested as a general title 'Discourses or Observations on the Prophecys of Daniel & the Apocalypse of St John.' He also mentioned that the book should be using as many 'sections out of the 2 Copys' as possible, to which I will return below.[531] He subsequently introduced a chapter schedule, which – with the inclusion of one additional chapter, 'Of the Times of the Birth and Passion of Christ' – became the framework for the *Observations*.

However, Folkes was not the only person involved in devising the mould in which Newton's prophetic studies would be presented to a larger audience. Included with the drafts are '3 Proposals of y^{e} Order of Printing', detailing several setups with either one or two books, and appendices; see **Figure 26**.[532] One of these, 'Titles in y^{e} 3^{d} proposal', is the one suggested by Folkes, including his remark that 'in the second copy [the most considerable thing I see are] the first 20 lines of page 33. which gives a sort of general notice of what follows and which I would therefore insert instead of the 3 first of page 67. of the old after which the old is the fullest.'[533] Apparently, the editors found two versions for a work on the prophecies among Newton's papers, an older and a newer copy, and decided to select from both.[534] On the opposing page, two tables listed the 'Titles in y^{e} old' and 'Titles in y^{e} New', including the appropriate page numbers, which the author copied from the manuscripts he was sent.[535] The other two content proposals, drafted alongside the one copied from Folkes, contain similar compilations of chapters – or parts thereof – taken from either the 'old' or the 'new' version.

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[530] *Never at Rest*, 864; Folkes would eventually become President in 1742, after Sloane's death.
[531] Yahuda Ms. 7.2b, fol. 1^{r}.
[532] Yahuda Ms. 7.2j, fol. 95^{v}.
[533] Yahuda Ms. 7.2b, fol. 2^{v}.
[534] These two versions seem to correspond with Pellet Nos. 58, 'Nine chapters being one hundred & forty half sheets & two pieces in folio the title of w^{ch} is concerning the language of the prophets', and 81, 'Forty half sheets in folio being the History of the Prophecies in ten chapters & part of the 11th unfinished'; Keynes Ms. 127A(4), n. f. See also C. Hutton, *Mathematical and Philosophical Dictionary* (2 vols., London, 1795), Vol. 2, 155-157.
[535] Yahuda Ms. 7.2j, fol. 96^{r}.

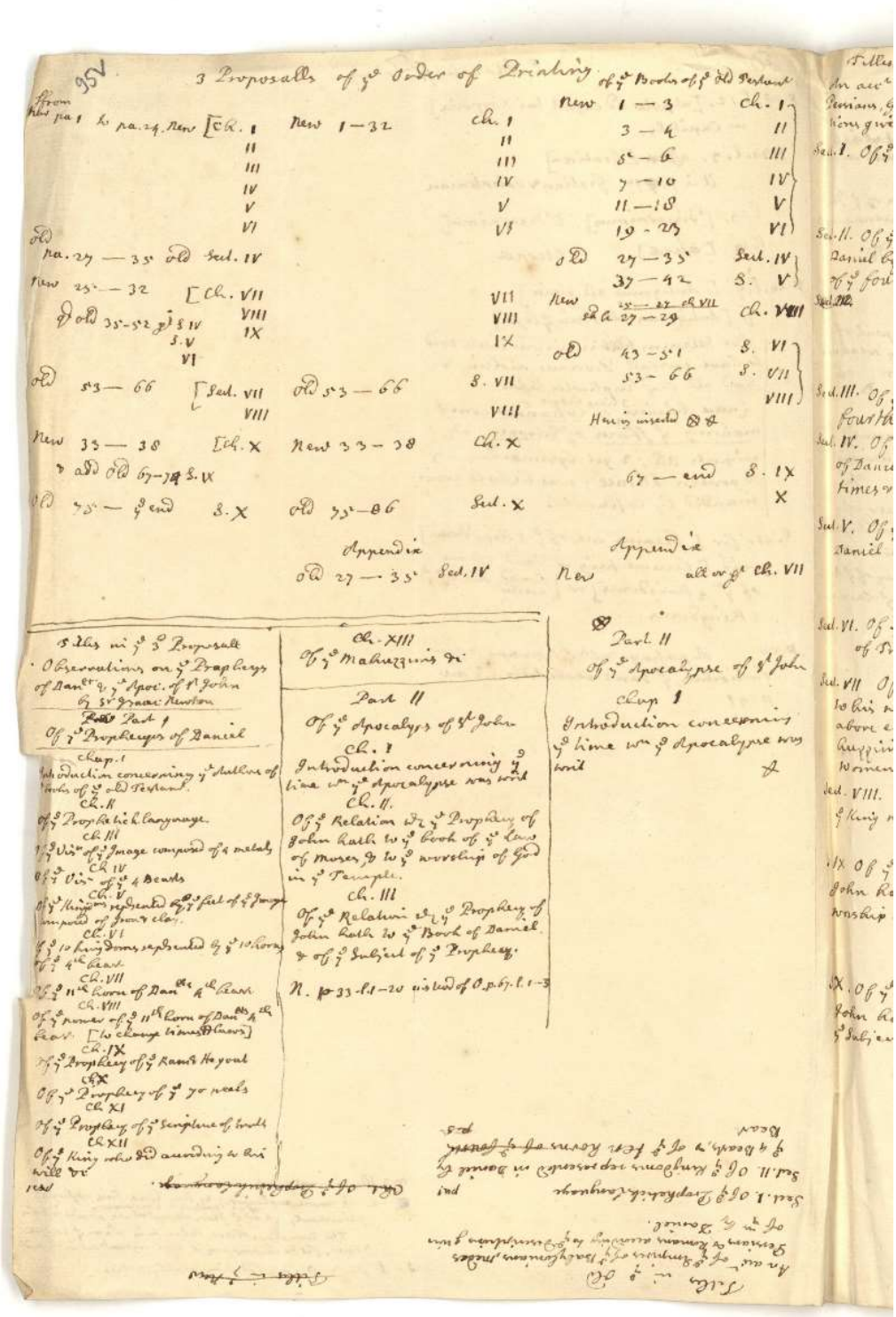


Figure 26. Thomas Parker's '3 Proposals for y^e^ order of Printing' of Newton's prophetical studies. Yahuda Ms. 7.2j, fol. 95^v^.

On the other side of the page that contains these proposals, a list was drawn up with several emendations to sections from both the old and new copy, accompanied by a name in an unknown hand. That name reads 'E. Macclesfield' and refers to Thomas Parker (1666–1732),

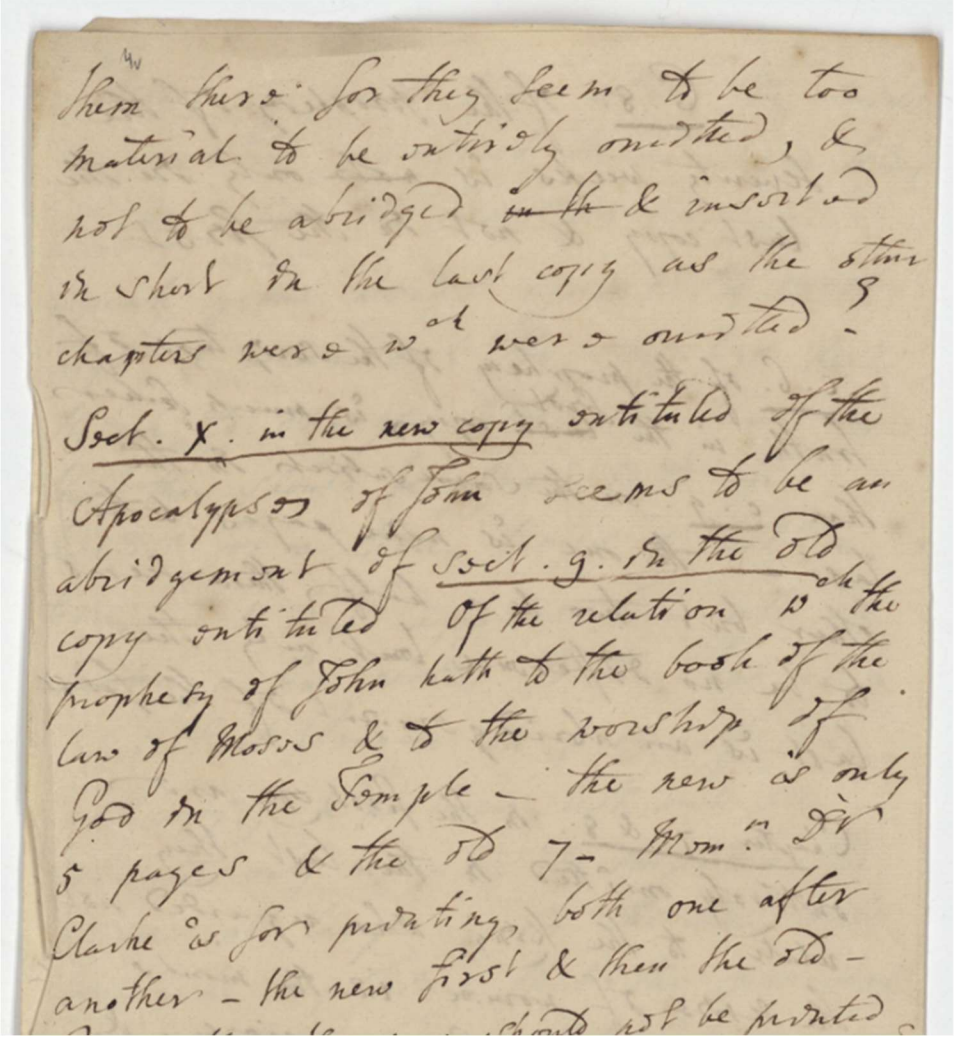
first Earl of Macclesfield, FRS, and former Lord Chancellor, who had been one of Newton's pallbearers and must be assumed the author of these lines and of the three proposals.[536]

Returning to the manuscript with Folkes's notes, the next four folios are in the hand of John Conduitt. From his 'Remarks upon the Prophecies', covering nine small pages, it is clear he did not inspect just the two versions marked as 'old' and 'new', but also various other copies.[537] Folkes and Parker might not have had access to these – they were probably only shown the old and new versions, although Folkes would later inspect other papers – but Conduitt certainly had, as Newton's executor. Apart from his detailed analysis of the various papers, there are also notes that show that Conduitt discussed the manuscripts with at least two other persons. Mentioning the absence of a chapter on the extent of the Pope's power from the 'new' version, he noted that Macclesfield was of the opinion that the reason why Newton left this chapter out, was because it related only to the Pope's spiritual dominion and not his earthly. Further down, in one of his characteristic memoranda, he wrote that 'Sect. X. in the new copy entitled of the Apocalypses of John seems to be an abridgement of sect. 9. in the old copy... Dr Clarke is for printing, both one after another – the new first & then the old'; see **Figure 27.** Clarke, whose name returns in another memorandum, clearly refers to Samuel Clarke, Newton's staunch defender in the debate with Leibniz on the *Sensorium Dei* and on many other topics, and his parish priest during his later years.[538] That Clarke received and read both versions is clear

[536] A.A. Hanham, 'Thomas Parker, first earl of Macclesfield (1667–1732)', *ODNB*. Although Parker passed away before the *Observations* were published, and hence the title from that moment would refer to his son George - just like his father Fellow of the Royal Society and a keen astronomer - in this case the older Parker was involved; see E. Edwards, *Libraries and Founders of Libraries* (London, 1864), 341: 'One of the latest of [Thomas Parker's] personal labours was the collation of Sir Isaac Newton's Observations on Daniel and the Apocalypse, from two distinct and very different MSS., but the task remained incomplete…', referring to the old and new version, and to the list of proposals.

[537] Yahuda Ms. 7.2b, fols. 3^{r}-7^{r}; the passage is on fol. 6^{v}.

[538] Yahuda Ms. 7.2b, fols. 3^{r}, 4^{v}, 5^{r}; Snobelen, *Isaac Newton, heretic*, 399. The Leibniz-Clarke debate has been actively studied; publications include, but are not limited to, A. Koyré and I.B. Cohen, 'The Case of the Missing *Tanquam*: Leibniz, Newton & Clarke', *Isis*, 52 (1961), 555-66; A.R. Hall, *Philosophers at War: The Quarrel between Newton and Leibniz* (Cambridge, 1980); E. Vailati, *Leibniz and Clarke: A Study of Their Correspondence* (Oxford, 1997); R. Ariew (ed.), *G.W. Leibniz and Samuel Clarke: Correspondence* (Indianapolis, 2000); A. Janiak, *Newton* (Chichester, 2015), 117-38.



them there: for they seem to be too
material to be entirely omitted, &
not to be abridged ~~in the~~ & inserted
in short in the last copy as the other
chapters were w^ch were omitted?

Sect. X. in the new copy entitled of the
Apocalypse of John seems to be an
abridgement of Sect. 9. in the old
copy entitled Of the relation of the
prophecy of John hath to the book of the
Law of Moses & to the worship of
God in the Temple — the new is only
5 pages & the old 7 — Mem^m Dr
Clarke is for printing both one after
another — the new first & then the old —
should not be printed

Figure 27. John Conduitt's analysis of Newton's prophetical studies, referring in a 'Mem^m' to Samuel Clarke. Yahuda Ms. 7.2b, fol. 4^v.

from a slip of paper, oddly misplaced among Newton's mathematical papers, which contain his suggestions on which parts to include: 'From p. 1 to pag. 24 new [26 old] print the New. Then interpose Sect. IV of the old…'; see **Figure 28**. From the final lines, one might infer that Clarke had a rather intimate understanding of Newton's writings during the last weeks of his life, or ventured an educated guess: '...go on with the old, pag 75 to the End. For the New is perfect no further; the Author then dying.'[539] The slip appears to be half of a letter dated 7 March 1727/28 relating to the workhouse in the parish of St James, Westminster. Since Clarke passed away in May 1729, plans for publishing the *Observations* were evidently well underway

[539] CUL Ms. Add. 3964.5, fol. 16^r.

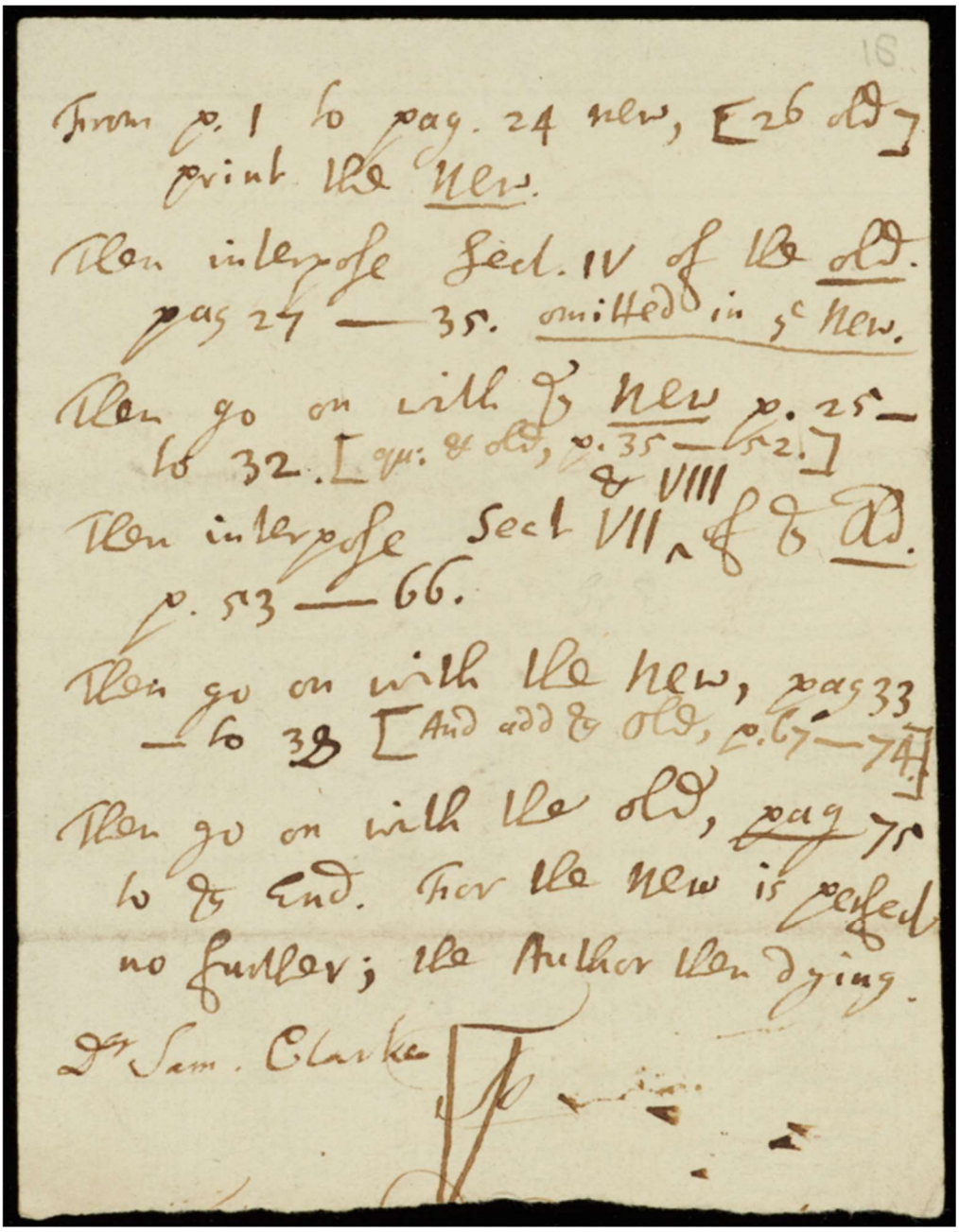


Figure 28. Samuel Clarke's suggestions for which parts of the 'old' and 'new' manuscript to include in the Observations. CUL Ms. Add. 3964.5, fol. 16r.

by then. Indeed, William Whiston, who was not directly involved with the publication, remarked that it was initially meant to appear in 1730; but for obscure reasons it took another three years before the volume came out.[540] What is more, in his notes Conduitt copied Clarke's

[540] W. Whiston, *Historical Memoirs of the Life of Dr. Samuel Clarke* (London, 1730), 96; see also Mandelbrote, 'Eighteenth-Century Christianity', 558-59.

suggestions verbatim, and Parker likewise included Clarke's proposal alongside Folkes' chapter structure.[541]

There are two more autographs in the manuscript that contains Conduitt's and Folkes's hand. Underneath a deleted chapter heading, in Newton's hand, there is a list of abbreviated chapter titles – 'Ram & Hegoat... Ten Horns… Scripture of Truth...'[542] Some of these entries are followed by 'printed', sometimes with a page number. One chapter, 'Empire of the Latines', appears twice, the second time followed by 'much varies from w^{t} is printed & is as long again.' What is clear is that this list represents a stage in the printing process of the various chapters that were included in the volume; it is also clear that its compiler was not too bothered with exact names. Here then we might have Benjamin Smith, but since his autograph is unknown there is no way to verify this. The final hand among these editorial notes refers to 'The introduction, Of the Church' which, according to the author, 'was manifestly intended to be a preface to the Discourses in Daniel and should therefore be placed before them.'[543] Following some further notes, the short contribution is signed by 'B^{p} Sherlock', that is Thomas Sherlock (1678–1761) who became Bishop of Bangor on 4 February, 1728, having previously been Master of St Catherine's College, Cambridge (1714–19) as well as Dean of Chichester (from 1715).[544] Sherlock's advice on the introduction, presumably included with one of the versions, was indeed accepted, though the title changed to 'Introduction concerning the Compilers of the books of the Old Testament', made up by Folkes.[545]

That Conduitt and Folkes should be considered the main editors is evident. Folkes's hand is all over the manuscript that was eventually printed, including an inserted sheet with several paragraphs for part 1, chapter 10, 'Of the Prophecy of the seventy Weeks', compiled from

[541] Yahuda Mss 7.2b, fol. 7^{r} and 7.2j, fol. 95^{v}.
[542] Yahuda Ms. 7.2b, fol. 9^{r}.
[543] Yahuda Ms. 7.2b, fol. 10^{r}; see CUL Ms. Add. 3989, fols. 1^{r}-6^{r}. A variant version can be found in Ms. Bodmer, section titled 'Of the Church: 'An Introduction' and Tables of Content', fols. 1^{r}-2^{v}.
[544] C. Haydon, 'Sherlock, Thomas (1677–1761)', *ODNB*; E. Carpenter, *Thomas Sherlock 1678–1761* (London, 1936), 23; J. Nichols, *Literary anecdotes of the eighteenth century...* (London, 1782), 466-71.
[545] CUL Ms. Add. 3989, fol. 1^{r}, still bears the original title.

drafts found elsewhere.[546] The massive manuscript known as *Of the Church* – which starts with a variant version of the introduction to the *Observations*, suggested by Sherlock – has annotations by Pellet, Folkes, and at least one other editor, and seems to have been first consulted when the *Observations* was already in print. At the beginning of a section related to the Roman Empire and the establishment of the papacy, Folkes wrote down: '22 Pages... Printed from y^{e} Hand in p. 5 to y^{e} hand in p.15 & makes up the chapter 8 in the Prophecies of Daniel, but should be reprinted'. And indeed, preceded by some draft materials, what follows are 23 numbered folios, with a little hand added in the margins of pages 5 and 15 corresponding with the materials in Chapter VIII of the first part of the *Observations*. However, there are many differences between this text and the printed version; also, the version from *Of the Church* is almost ten pages longer.[547] Meanwhile, Conduitt must have been involved in the identification and management of the various manuscripts, including the old and new versions, making these available to Smith, Folkes, Macclesfield, Clarke, Sherlock, Pellet, and others. Whether Folkes and Conduitt were also responsible for the chapter-wise ordering of the theological manuscripts in the several sections that now comprise Yahuda Ms. 7, is unclear. From the editors' notes it appears that the 'old' and 'new' versions they collated were found, not constructed. As I have shown in Chapter 3, Newton himself used files to order his materials chapter by chapter.

What Folkes and Conduitt, assuming their role as main editors, did *not* do, was pay respect to the section and chapter structure Newton had created. 'Of y^{e} Prophetick language' was labelled by Newton 'Sect. 1' in the old version, and 'Chap. 1' in the new.[548] Yet Folkes chose

[546] CUL Ms. Add. 3989, fols. 46^{r-v}. The first paragraph on fol. 46^{r}, and the first two lines of the second, were most likely compiled from Yahuda Ms. 7.1f, fols. 1^{r}-3^{r}. The remaining lines on these page seem to originate from fol. 47^{r}, where Newton wrote 'The Prophecy of Daniel's weeks I translate & interpret thus'; Folkes has 'This prophesy I translate & interpret thus' ; see also Yahuda Mss. 7.1j, fol. 23^{r} ('...the whole I just translate and interpret…') and 7.1c, fol. 7^{r} (the deleted paragraph). The text on fol. 46^{v} is taken from Yahuda Ms. 7.1c, fol. 8^{v}.

[547] Bodmer Ms., section titled 'Chapter No. 11. Of the Roman Empire in relation to its Ecclesiastical Dominion and legislature in matters of Religion', fol. i^{r}. See M. Goldish, 'Newton's 'Of the Church': Its Contents and Implications', in *CNI*, 145-64; id., *Judaism*, 110-17.

[548] See Yahuda 7.2j, fol. 96^{r}; and CUL 3989, fol. 7^{r}.

to add a chapter before that, the aforementioned 'Introduction concerning the Compilers of the Old Testament' – in agreement with Bishop Sherlock's advice – and hence renumbered the chapter on the prophetic language.[549] Such a renumbering was perhaps rather innocent, yet other chapters were more rigorously reordered. Newton never went beyond a chapter VI or section VIII in the materials selected by the editors; yet the first part of the *Observations* included no less than fourteen chapters.[550] Chapters XII to XIV were originally labelled by Newton Sections VI-VIII, thus part of a single chapter, with VII and VIII versions of the same section which he renumbered. As I showed in § 4.5.2, the title of Chapter X, 'Of the Prophecy of the seventy Weeks' originally also included the history of the Persian Monarchy and was clearly taken from a larger work on the four monarchies in relation to the prophecies. Finally, Chapter XI, 'Of the Times of the Birth and Passion of Christ', was an artificial construct devised by Folkes and at least one other editor. Never described as such by Newton, Folkes created the title from the first lines and the heading of Section II found on the next page, 'Of The ~~time~~ \year/ of Christ's ~~death stated determined~~ \birth/'. He subsequently decided to ignore much of Newton's own editing, including a page-long addition on one of the versos, instead following the advice of an anonymous editor who wrote underneath it, 'I imagine all this page is to be out.'[551] Finally, the choice to end the first part of the *Observations* with the two chapters on *mahuzzims* appears rather arbitrary.[552] From drafts found in other manuscripts, it is clear that Newton intended to continue his narrative with a chapter on 'the host of heaven', thus suggesting another connection with his writings on the history of the Church.[553]

For all their efforts, it is clear that the *Observations upon the Prophecies of Daniel and the Apocalypse of St John* was a work not just edited, but *constructed* by Folkes, Conduitt, and their collaborators, without including a proper advertisement explaining their deeds. They

[549] Yahuda 7.2b, fol. 1^{v}, has the new title; so has Yahuda 7.2j, fol. 95^{v}.
[550] Keynes Ms. 5, fol. 122^{r}, contains a chapter XI (originally VIII), 'The Prophesy of the three Woes at the voices of the three last Trumpets explained.'
[551] CUL Ms. Add. 3989, fols. 53^{r}- 54^{r}. The crossed-out addition is on 55^{v}.
[552] Yahuda Ms. 7.1n, fol. 9^{r}; the title is a partial reference to Dan. 11:36.
[553] See e.g. Yahuda Ms. 15, fol. 104^{r}, and the various headings in the Bodmer Ms.

interpreted two sets of manuscripts as two versions of a single work that dealt with Scriptural prophecy, to which they added the preface from yet another work. It is slightly mysterious why the editors chose to compile a copy text in the first place. There were several other manuscripts available that passed through their hands, which were in a much more complete stage of writing, such as the manuscript now known as Keynes Ms. 5. In the first of nine chapters found here, Newton introduced a framework for the interpretation of Scriptural prophecies, which he subsequently applied to the visions described in the book of Revelation. Indeed, the treatise could have been expanded and updated, replacing older drafts with more recent versions, but at least the editors would have had Newton's division for guidance, instead of mixing up sections and chapters as they did.

5.2.2 The *Chronology of Ancient Kingdoms*, much amended

Coincidentally, when Conduitt enlisted the help of Martin Folkes to prepare Newton's *Chronology of Ancient Kingdoms Amended* back in 1727, they had also been confronted with two sets of manuscripts – among piles of draft chapters – two sets that Newton had apparently selected as candidates for publication.[554] Then, the choice had been much easier, with one of the manuscripts in what appeared to be an advanced stage of completion. It was also the one manuscript Pellet decided was worthy of publication, with a handful of others that might be considered later.[555] The manuscript contained a neat text, with only minor deletions and interlinear additions, and just a handful of more substantial additions on the versos. Moreover, although Newton had not provided a chapter overview with this particular version, the first three chapter headings, 'Chap. I. Of the Chronology of the first ages of the Greeks', 'Chap. II. Of the Empire of Egypt', 'Chap. III. Of the Assyrian Empire' – all written very neatly – mimicked those of the other version, with the fourth chapter, 'Of the contemporary Empires of the

[554] CUL Ms. Add. 3987 and 3988. From Pearce, *Commentary*, xlii, we know that Thomas Pellet was also involved, but there are no editorial remarks in his hand. See also Mandelbrote, *Footprints of the Lion*, 129.

[555] Pellet No. 80, 'Containing an abstract of the Chronology being twelve half sheets in folio & the Chronology being ninety two half sheets in folio.' Keynes Ms. 127.4(A), n. f.

Babylonians & Medes' a contraction of what were originally separate chapters. Chapter five, providing a description of the Temple of Solomon and the Temple as seen in a vision by the prophet Ezekiel, was apparently added by Newton at a late stage. The final chapter now dealt solely with the Persians – in the second manuscript still connected with the Medes – although it is not entirely clear whether it was Newton or the editors who changed the chapter number from IV to VI.[556] The editors did feel the need to include a few lines about their policy, and added a short Advertisement to the *Chronology*, explaining that '[t]he Sixth Chapter was not copied out with the other Five, which makes it doubtful whether he intended to print it: but being found among his Papers, and evidently appearing to be a Continuation of the same Work, and (as such) abridg'd in the Short Chronicle; it was thought proper to be added.'[557] Indeed, they might have discovered that the Temple-chapter was also present in the second copy Newton considered, as part of the chapter on the Babylonians.

As an introduction, Folkes and Conduitt added a version of the *Short Chronicle*. Some chapters of the main work needed polishing up, where Newton had replaced pages with variant versions taken from other manuscripts, or was still in the process of editing these; at least here the editors stuck more or less to the order Newton indicated. They added several references where they felt Newton had left these out, deleted others, and inserted or expanded Greek quotations where Newton had only provided a few lines.[558] Perhaps they felt that

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[556] For a more elaborate study of the Temple by Newton, see Babson Ms. 434, titled '\Prolegomena ad/ Lexici Prophetici partem secundam… in quibus agitur De forma Sanctuarij Iudaici'; see Delgado-Moreira, *Epistemological and Rhetorical Strategies*, 110-67. See also HRHRC Ms. 132 for Newton notes on the measurements of the Temple, and Yahuda Ms. 26.3 for various drafts of the chapter as it appeared in the *Chronology*.

[557] Newton, *Chronology*, sig. a4^{v}. See also Pearce, *Commentary*, xliv, who quoted the above and added: 'This is the account given by the Publishers, and it agrees with mine, as far as it goes: if this then be the true account, it appears, that the five first Chapters of the Chronology of Ancient Kingdoms had the finishing Hand of the great Author: and it is most probable, that his Death only prevented his writing over the sixth chapter, and adding it to the others.' See also n. 555 above, where Pellet counted ninety-two folios in *Chronology* manuscript, which corresponds with CUL Ms. 3988, fols. 13^{r}-108^{r}, ignoring fols. 102^{r}-105^{r} which contain the plates for Chapter 5.

[558] CUL Ms. Add. 3988, fols. 36^{r}-37^{r}, 41^{r}-42^{r}. See for examples, CUL Ms. Add. 3988, fols. 29^{r} (added reference), 34^{r} (deleted reference), 55^{r}, 79^{r}, 89^{r}, 94^{r}/94a^{r} (expanded Greek quotation). See also Pearce, *Commentary*, xlii: '...the editors... did in some places put References to Authors in the margin of the Work; which are printed now as Sir Isaac's References.' Mind that there are differences even

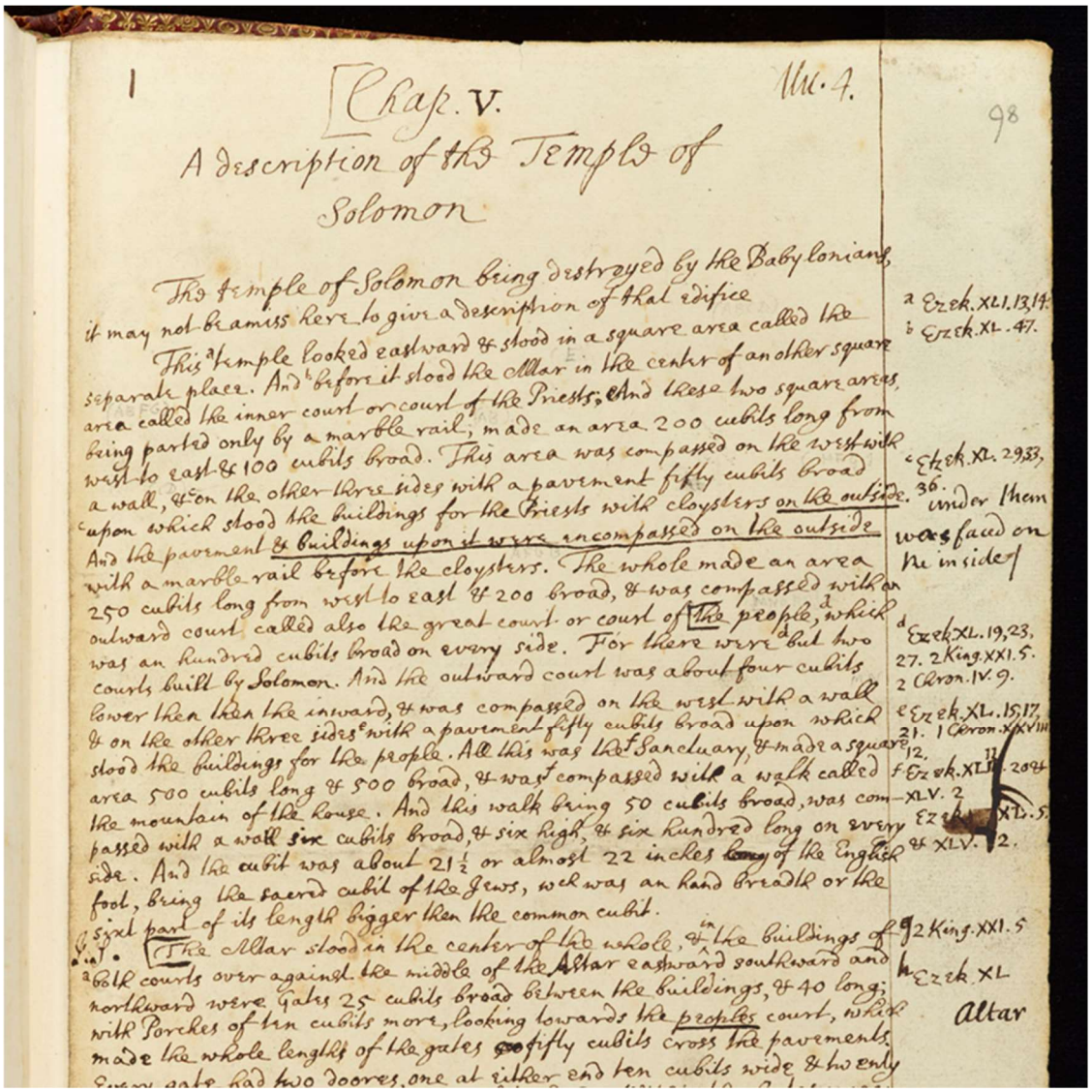


Figure 29. Martin Folkes's 'corrections' to the first folio of Chapter V of the *Chronology*, with the underlined passages meant to be replaced by the additions in the margin. CUL Ms. Add. 3988, fol. 98^{r}.

Newton had been too sparse with his references, or they realised that he had not had time to complete them, as I showed in Chapter 2. In the chapter on the Temple, Folkes made emendations where he thought the main text was unclear, or, in his view, plainly wrong; see **Figure 29**. In a description of the dwellings of the priests, Newton wrote that these had 'cloysters on the outside [a]nd the pavement & buildings upon it were encompassed on the

between CUL Ms. Add. 3988 and the printed text, e.g. note y on fol. 80^{r} vs. 281 of the *Chronology*, where the main text reference to chapter 1 of the book Tobit is removed, and replaced by 'Tobit. i. 13.' in the marginal note. A similar instance can be found a few paragraphs later (fol. 80^{r} / 282), where the editors inserted an additional reference not found in the manuscript, which suggests that minor changes were still made when the text was already in print, changes not recorded in the manuscript.

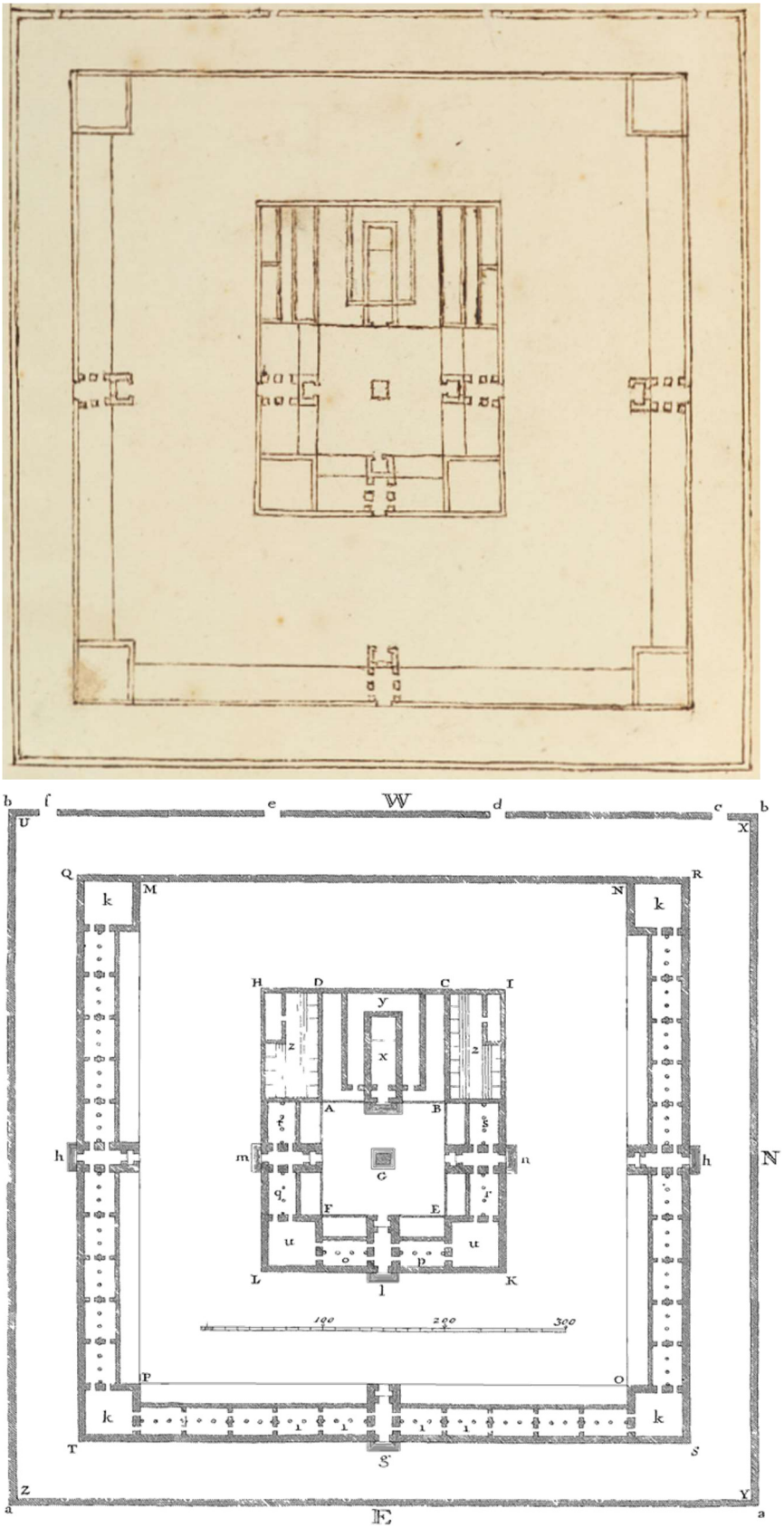


Figure 30a and **b.** Above: Newton's best attempt at a drawing of the Temple of Solomon. Below: one of the three plates that were included in the *Chronology*. CUL Ms. Add. 3988, fol. 102^{r}; Chronology, i.

outside with a marble rail…'[559] Folkes underlined most of this passage and added his corrections in the margin, changing the line to 'cloysters *under them*: and the pavement *was faced on the inside* with a marble rail…'[560] In a further emendation, Folkes replaced 'peoples' with 'Altar', resulting in a reference to a non-existing 'Altar Court'. One must assume Folkes meant to replace 'peoples *court*' with 'Altar', as Newton did himself a few pages later, but this was lost on the person overseeing the actual printing.[561] What is perhaps most unfortunate, was the editors' decision to make use of a different series of plates of the Temple from those found with the copy text, see **Figure 30a** and **b**. It was clearly meant as an improvement, presenting the reader with neat schematics instead of the author's own crude and incomplete drawings. However, Newton left the chapter in an unfinished state, with blank spaces for references to the various parts of the accompanying plates. The editors subsequently filled in several of these based on the coordinates from the original drawings, which they then copied onto the new set; but in particular towards the end of the chapter they simply ignored Newton's intended references.[562]

5.2.3 Catherine's codicil

After the publication of the *Chronology* and the *Observations*, it seems Newton's heirs made no further attempts to publish any of his theological writings. John Conduitt died in 1737, and his wife Catherine soon after. Yet Catherine did leave a codicil to her will, in which she charged Arthur Ashley Sykes, a friend of Samuel Clarke and religious controversialist, with the publication of all of Newton's theological papers, including 'one of the three that bear Record

[559] CUL Ms. Add. 3988, fol. 98^{r}.
[560] Ibid., italics mine. See *Chronology,* 332 for the printed result.
[561] CUL Ms. Add. 3988, fol. 99^{r}; italics mine; *Chronology*, 336. In the manuscript, Folkes only underlined 'peoples' (see also **Figure 29**).
[562] See CUL Ms. Add. 3988, fols. 106^{r}-107^{r}; *Chronology*, 343-46. Although the plates of the Temple have traditionally been ascribed to Newton, they are unlike anything Newton ever drew, and not in the least comparable to the crude schematics found in CUL Ms. Add. 3988. From their style and neatness it appears that the plates in the published *Chronology* were drawn by an artisan, perhaps even an architect, with the accompanying text supplied by the editors. See CUL Ms. Add. 3988, fols. 102^{r}-103^{r}, 105^{v}; compare with Babson Ms. 434, fols. 7, 13-14, 91-92; Yahuda Ms. 14, fols. 5^{r}-7^{r}.

in Heaven', 'a peice called paradoxicall questions concerning Athanasius, another the history of the Creed or criticism on it, and a church history compleat, and many more Devinity tracts.'[563] It appears that the codicil was ignored by Catherine's daughter, Kitty, who married John Wallop (from 1743 Viscount Lymington) when his father had been made first Earl of Portsmouth. Only in the autumn of 1755 did John Wallop hastily send several of the manuscripts to Sykes, making sure to draw up a list first in order to keep track of which materials were included.[564] The heirs' request to examine these papers was likely triggered by the recent unauthorized, anonymous, and incomplete, publication of Newton's *Two notable corruptions of Scripture*, the letters he sent to 'a friend', John Locke, in 1690, and the manuscript about 'one of the three that bear Record in Heaven' mentioned by Catherine.[565] Here, Newton discussed how two key passages in Scripture that dealt with the dogma of the Trinity, 1 John 5:7 and 1 Timothy 3:16, had originally not been part of the Greek and Latin versions of the text. Although he originally agreed to have the letter published, anonymously, he soon retracted his permission; but a copy of the letter remained with Jean Le Clerc, the Dutch Remonstrant theologian. Several years later, Newton again contemplated publication of the tract, but thought better of it once more and abandoned the enterprise.[566] When the work was finally published, in 1754, its existence had been a public secret for decades; still, it

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[563] NCL Ms. 361.4, fol 139[r]. The 'Church History compleat' is presumably a reference to the Bodmer manuscript, or to Yahuda Ms. 15. Sykes also defended Newton's *Chronology* in his '*An examination of mr. Warburton's account… of… Sir Isaac Newton's chronology* (London, 1744), 222-364; see also *Orig. of Civ.*, 397.

[564] Keynes Ms. 127A(4) contains a list with 11 items dated November 1755, which were sent to Sykes. As a little note now glued to the back of the list and dated Feb. 1770 explains, the list was kept by the then Lady Portsmouth, 'as she knows not whether the papers specify'd were return'd by Dr. Sykes.' See also Mandelbrote, 'Eighteenth-century reactions', 103; id., 'Eighteenth-century Christianity', 565-66.

[565] *Two Letters of Sir Isaac Newton to Mr. Le Clerc…* (London, 1754), 13-14; *Correspondence*, Vol. 3, 83-147. For a detailed analysis of the letters and their history, see R. Iliffe,' Friendly criticism: Richard Simon, John Locke, Isaac Newton and the Johannine comma', in Hessayon and Keene, *Scripture and Scholarship*, 137-57; Mandelbrote, 'Eighteenth-century Christianity', 569 ff. See also *Historian*, 14-15; Mandelbrote, 'Eighteenth-century reactions', 105-09, and id., 'Isaac Newton reads the Fathers'; S.D. Snobelen, ''To us there is but one God, the Father': Antitrinitarian Textual Criticism in Seventeenth- and Early Eighteenth-Century England', in Hessayon and Keene, *Scripture and Scholarship*, 116-36, esp. 128-35; Schilt, 'Hints of Things', 63-64. For Newton and Locke, see also K.I. Parker, 'Newton, Locke and the Trinity: Sir Isaac's comments on Locke's: A Paraphrase and Notes on the Epistle of St Paul to the Romans', *Scottish Journal of Theology*, 62 (2009), 40-52.

[566] See Mandelbrote, 'Eighteenth-century Christianity', 574-75.

caused quite a stir, especially among Church of England theologians, who summarily dismissed Newton's arguments. Samuel Horsley, the later bishop of Rochester, included it dutifully in his five-volume edition of Newton's works, but in his sparse annotations expressed nothing but disdain for Newton's scholarship.[567]

It is curious though that the papers which allegedly were in Sykes' possession when he died in 1756, and which subsequently became the New College papers, included none of those mentioned in Catherine Conduitt's codicil, nor – with a single exception – those listed in November 1755 by the Portsmouths.[568] Apart from 'N^{o}.8 A book of Chronology &c.' it appears that all other manuscripts ended up in the Bodmer and Yahuda collections.[569] The New College papers, on the other hand, contain what are now four volumes with drafts related to the 'Originals', the *Short Chronicle*, the *Chronology*, and *Two Notable Corruptions*, which matches the description given in a letter dated 27 March 1757 by the Reverend Jeffery Ekins, who obtained the papers after Sykes' death.[570] If the manuscripts listed in November 1755 were indeed sent to Sykes, they were also returned straight after his death, and never became part of the Ekins papers. How the other materials ended up with Sykes, and why they were not returned, is equally mysterious. In his letter, Ekins mentioned Catherine Conduitt's codicil, and how she had appointed Sykes to revise the manuscripts before publication. In the next line he wrote that 'some few of these [papers] were found in the hands of [her] executor after his decease, & are at present in my possession.' That executor would have been the Reverent Alexander Chalmers, whom Catherine had appointed as her sole executor – and guardian to her daughter – in 1739; it is possible that Sykes obtained the papers from Chalmers after the

[567] S. Horsley, *Isaaci Newtoni opera quae extant omnia* (5 vols., London, 1779–85), Vol. 5, 493-550.
[568] Cf. Whiteside, *Mathematical Papers*, xxiii-iv, n. 27; Iliffe, 'Connected system', 141; Dry, *Newton Papers*, 28.
[569] Keynes Ms. 127.4(A), n. f.
[570] Ekins had been appointed as one of her three executors by Catherine and John Conduitt's daughter, Catherine (Kitty) Wallop, in her will, drawn up in 1750. Ekins' heirs donated the papers to New College, Oxford, in 1872; they are today NCL 361.1-4. See NCL Ms. 361.4, fol. 141^{r-v} for Ekins' letter to Wilcox. For a concise but detailed description of the relation between the Newton, Conduitt, and Ekins families, see J. 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). See also Brewster, *Memoirs*, Vol. 2, 342; Dry, *Newton Papers*, 28.

latter's death in 1745.[571] In his letter of March 1757, Ekins had to confess that he had no idea what had happened to the Conduitt papers after Catherine's death in 1740. Unbeknownst to Ekins, by then a Dr Phil Barton had been able to get hold of Lord Portsmouth who informed him that 'all the papers he ha[d] w^{ch} relate to S^{r}. Isaac Newton' had lately been 'under the Perusal of a Gentleman who died before y^{t} Perusal was finished', but that they were now back at his seat in Hampshire.[572] That gentleman must have been Sykes, which suggests that at some point he might have had most if not all of the papers that were in Conduitt's possession. What part of the manuscripts he actually consulted, remains unclear; the answer might lie in his own papers, which are kept at Emory University in Atlanta. In any case, Sykes never finished his task, although there is evidence that he perused the manuscripts for his own gain. His *An Enquiry when the Resurrection of the Body, or Flesh, was first inserted into the Public Creeds*, published posthumously in 1758, seems to have been more than just a little inspired by Newton's writings on the topic.[573]

At some moment between 1728 and 1754, another editor appears to have been considering some of Newton's writings for publication. Among the New College papers are five pages of editorial remarks preceding Newton's summary in the version of the 'Original of Monarchies' found there, in a hand that is not John Conduitt's, although traditionally attributed to him; nor

[571] NA PROB 11/700 fols. 261^{v}-264^{r}; I am very grateful to Jason Morgan for bringing this to my attention. Cf. Whiteside, *Mathematical Papers*, xxiv, who claimed that William Hanbury in a letter to Robert Smith, mathematician and Fellow of Trinity College, Cambridge, confirmed that Catherine had appointed Sykes as executor; however, nowhere does the letter mention Sykes. See Hanbury to Smith, 8 March 1757, TCL Ms. R.16.38.410.

[572] Phil Barton to William Hanbury, 15 March 1757, TCL Ms. R.16.38.415; see also TCL Mss. R.16.38.413 and 414.

[573] Iliffe, 'Connected system', 141-42; Brewster, *Memoirs*, Vol. 2, 341-42; Mandelbrote, 'Eighteenth-century reactions', 108; id., 'Eighteenth-century Christianity', 565-66; Dry, *Newton Papers*, 28. A.A. Sykes, *Enquiry when the Resurrection of the Body, or Flesh, was first inserted into the Public Creeds* (London, 1757). See also J. Stephens, 'Sykes, Arthur Ashley (c. 1684–1756), Church of England clergyman and religious controversialist', *ODNB*; Goldish, *Judaism*, 110 n. 4; *Historian*, 181; *Never at Rest*, 491. Of Sykes *Enquiry*, John Disney, in his *Memoirs of the Life and Writings of Arthur Ashley Sykes, D.D.* (London, 1785), 344-45, wrote that '[h]is 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…' There are indeed parallels between Sykes's treatise and Newton's writings on the topic in the Bodmer Ms.

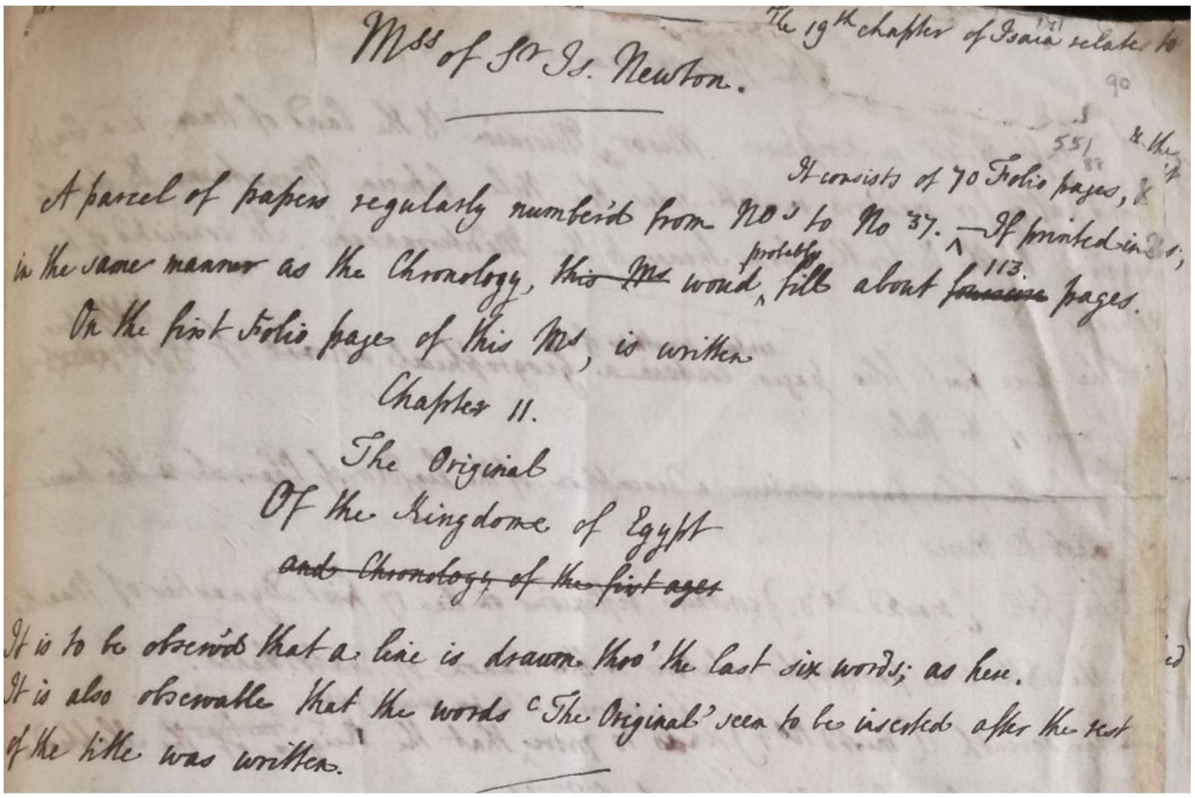


Figure 31. An unknown editor's notes to Newton's chronological papers. NCL Ms. 361.1, fol. 88r.

does it appear to be Sykes'; see **Figure 31**.[574] After a detailed content description, the editor weighed the pros and cons of another publication. From studying the manuscript, it had become clear that much of the material had already been printed in the *Chronology*, '& perhaps more correctly'. Yet the very fact that these were writings of Isaac Newton meant that they 'must certainly contain something \very/ valuable to the publick.' He was especially taken with the second chapter, because, as he wrote, 'this... may in itself be consider'd as a complete work: as it seems to comprise the history of Egypt from the remotest antiquity down to the final overthrow of that kingdom by the conquest of the Persians.' That he seriously entertained publishing the chapter is clear from his introduction, suggesting that it might be printed with

[574] NCL Ms. 361.1, fols. 88r-90r. On fol. 87r there are notes by a New College Librarian, referring to the subsequent pages as 'probably in the handwriting of John Conduitt'; Manuel, in *Historian*, 14-15, asserted that these papers were studied by Conduitt in May 1729 and that the editorial comments were his. There are marginal annotations by John Conduitt in the manuscript, comparing it with the published *Chronology*, but all of these appear on folios that were included with the manuscript at a later date. I compared the hand with Bodleian Ms. Eng th. C.25., fols. 179-81, A.A. Sykes to Thomas Brett, 18 April 1715, but cannot make a positive identification.

‘the unpublished Paper of Sr Isaac relative to the Ep. of S. John’, a reference to the letters to Locke, which implies that he was writing before 1754; however, his identity remains a mystery.[575]

5.3 Revolutions in scholarship

It is clear that Folkes, Conduitt, Clarke, Sykes, and the other editors of Newton’s scholarly writings were indeed mainly that: editors. Their goal was publication, singling out writings they assumed Newton had been preparing for exactly that purpose, writings that were easily available, accessible, and took little time to prepare. There are many parallels with the treatment Newton’s scholarly corpus received during the twentieth century. Primacy went to those writings that were easily available and accessible, mainly for their neat hand and orderly status. This is wholly understandable when we once more recall the extremely fragmented nature of the corpus, and the lack of means to easily search and compare the thousands of manuscript folios. However, with the dawn of the twenty-first century, much has changed in terms of the availability of manuscripts, their accessibility in terms of reading and comparing, and the time it takes to perform these actions. In the remainder of this chapter, I will discuss in what ways the digital revolution has changed Newtonian scholarship.

5.3.1 Availability and access

During the second half of the twentieth century, Newton’s scholarly writings became once more available to academics, in particular with their combined release on microfilm in 1991.[576] Researchers no longer needed to visit the various archives in the United Kingdom, United

[575] NCL Ms. 361.1, fol. 90$^{r.}$

[576] The Yahuda collection had been available on microfilm from the early 1970s, but remained obscure; see R. Iliffe, ‘Digitizing Isaac: The *Newton Project* and an electronic edition of Newton's papers’, in J.E. Force and S. Hutton (eds.), *Newton and Newtonianism: New studies* (Dordrecht, 2004), 23-38, esp. 26.

States, Israel, and Switzerland, but could inspect the manuscripts in their university library. The real breakthrough came with the internet, and the emergence of the online *Newton Project*. Thanks to the efforts of Cambridge University Library and the National Library of Israel, scholars can examine most of Newton's manuscripts online, in a quality and a resolution unparalleled by microfilm, or, in fact, by the original. It is possible to zoom in to an almost cellular level, to read and compare various manuscript pages. These images are connected with the transcriptions created by the *Newton Project*, which present the manuscript text in a diplomatic format, with all additions and deletions visible, and in a normalised format, applying these additions and deletions and thus resulting in a neat, legible, and analysable text. Apart from providing thousands of transcriptions, and translations of several important Latin writings, the project's website is also a *knowledge site*, to use the term introduced by Peter Shillingsburg, a repository with primary and secondary sources related to Newton's life and work.[577] With Newton's manuscript corpus unparalleled in both size and completeness, and with most of that corpus transcribed, combined with the abundance of digitized early modern texts, the *Newton Project*'s resources allow for unprecedentedly high-granular research. Only now do we have real access to most of Newton's writings: not only are they available, they are also easily readable and comparable, taking only a fraction of the time it would have cost in the pre-transcription era.

So far, the research done by historians of Newton's scholarly writings has always been constrained in terms of availability, access, and time. Thus, the results of their scholarship have always been limited in terms of scope, depth, and general validity. For instance, Frank Manuel considered that the New College version of the 'Original of Monarchies' did not differ much from the Keynes version, based on a superficial analysis of their contents; whereas I have shown that the differences between these two manuscripts are profound. Likewise,

[577] P.L. Shillingsburg, *From Gutenberg to Google: Electronic Representations of Literary Texts* (Cambridge, 2006), 5 and 88 ff. For the gestation of and philosophy behind the *Newton Project*, see R. Iliffe and J.T. Young, 'Newton on the Net: first and prospective fruits of a Royal Society grant', *NRRS*, 58 (2004), 83-88, and in particular Iliffe, *Digitizing Isaac*. See also N. Guicciardini, 'Digitizing Isaac Newton', *Isis*, 105 (2014), 403-09.

Richard Westfall considered the 'Origines' and the 'Originals' stages of a single work that Newton undertook in the 1680s, which he transformed into the *Chronology of Ancient Kingdoms Amended* during the last decades of his life. It is now clear that Newton began the work between 1684 and 1689, and never stopped revising and expanding it. These examples are not meant to discredit the works of these eminent historians, but simply to point to the fact that they were operating in a different time and place, with limited resources.

5.3.2 Enter the digital

Manuel realised the need for an integral approach to Newton's chronological writings when he mentioned that the task of preparing an edition including all variant versions would be 'Herculean', which he wrote even before he had inspected the massive Yahuda corpus.[578] Indeed, in the legend Hercules was only able to complete the twelve tasks thanks to his superhuman strength and cunning. In a sense, this is what the digital availability of Newton's manuscripts and transcriptions can provide. Thanks to the digital revolution that has swept over the 'Newtonian Industry' and beyond, the historian is no longer limited by time constraints because of how computer analysis can speed up research dramatically. This allows us to rebuild our understanding of Newton's chronological research from the ground up, whilst including the work of previous scholars wherever possible. What this does require, though, is a profound change in historical methodology.[579] Suddenly, the word *data* enters the discussion, and with it the fields of information management, architecture, and technology. It is not as if historians of the past were not managing the information they worked with, but they did so on a much smaller scale. In order to manage tens of thousands of manuscript images and millions of words, historians need to go about systematically collecting, transforming, ordering, and storing their data. Only then can the process of analysing and querying begin.

[578] *Historian*, 16.
[579] See D. Edelstein, 'Intellectual History and Digital Humanities', *Modern Intellectual History*, 13 (2016), 237-46, esp. 237-38.

As such, digital history incorporates elements from the sciences and the humanities, crossing the divide between these two disciplines, which seems very appropriate when studying the scholarly writings of a man known for his contributions to science. Over the past two decades, the field of digital history has emerged as a promising avenue for researching large historical corpora and data collections.[580] Data driven digital history projects such as *The Proceedings of the Old Bailey, 1674–1913*, also known as the Old Bailey Online, which contains data of close to two hundred thousand criminal trials, and its sister project *London Lives, 1690–1800: Crime, Poverty and Social Policy in the Metropolis*, based on 240,000 manuscripts and containing over 3.3 million names, heavily promote search engines and tools for statistical analysis to query their large datasets and provide meaningful quantitative facts about the topics they cover.[581] Alternatively, there are many data-driven historical projects that focus on network analysis, mapping the relations between the various personae and geographical locations involved in, for instance, the Republic of Letters, or between the details of the over 50,000 medical records found in the casebooks of the prominent Elizabethan and Jacobean astrologer-physicians Simon Forman and Richard Napier.[582] Digital editions then focus on the presentation of textual corpora beyond the possibilities of print, both in terms of size and depth. A physical book can only contain so much data until it becomes too cumbersome to handle, often literally. These limitations are no longer present in the digital realm, which allows for nearly unlimited capacity and the ability to present texts in multiple ways at the same time. As I have shown above, The *Newton Project* is a key example of such a digital edition, albeit much enhanced.[583] Together with the wealth of material available in various online repositories

[580] See J. Guldi and D. Armitage, *The History Manifesto* (Cambridge, 2014), esp. 88-116; G. Zaagsma, 'Digital History', *BMGN – Low Countries Historical Review*, 128 (2013), 3-29.
[581] As has been done in T. Hitchcock and W.J. Turkel, 'The Old Bailey Proceedings, 1674–1913: Text Mining for Evidence of Court Behavior', *Law and History Review*, 34 (2016), 929-55.
[582] See http://www.culturesofknowledge.org/, http://republicofletters.stanford.edu/, and the *Circulation of Knowledge and Learned Practices in the 17th-century Dutch Republic* project via http://ckcc.huygens.knaw.nl. For an analysis of this type of network analysis, see e.g. S. Ophir, 'A New Type of Historical Knowledge', *The Information Society*, 26 (2010), 144-50. For the Casebooks Project, see *http://www.magicandmedicine.hps.cam.ac.uk/*.
[583] Today, there is a vast body of literature on digital editing and digital editions, primarily addressing theoretical and technical concerns, and seemingly perennially obsessed with defining itself even after

and tools for data analysis, the digital availability of Newton's writings allow historians to approach their subject more closely than ever before. Not only can we take in the macroscale of his reading, note-taking and writing, we can also drill down to the microscale, the minutiae of Newton's daily working practices, as I have showed in the previous chapters.

There is one other, fundamental change in Newtonian scholarship that the digital availability of manuscripts and texts enables us to make, which rather counterintuitively involves material culture. Until now, the building blocks of Newton studies have always been his writings, the words he put to paper. Obviously, these are the entities that matter: Newton conveyed his ideas through the written word. However, more often than not it has been difficult to trace the development of these ideas, in particular due to the fragmented nature of the corpus. With his writings on natural philosophy and mathematics, this has been less of a problem, as there is a natural progression of discoveries; although there are manuscripts such as *De Gravitatione* which keep dividing opinion as to their date of composition.[584] But with his scholarly writings things are not so clear. To establish the development of Newton's chronological project, both words and paper matter. The hand, the ink, the colouring of the paper and the layout of the page are all clues that inform how manuscripts folios were once connected in time and space. Having high-quality digital images of these folios makes possible the process of restoring the

three decades of scholarly practice. Typical examples include the contributions included in M. Deegan and K. Sutherland, *Text Editing* (Farnham, 2009), and M.J. Driscoll and E. Pierazzo, *Digital Scholarly Editing* (Cambridge, 2016). Despite both volumes having a section on practice, there is hardly any material on the latter; those authors that do discuss practice do so purely from the point of view of *creating* digital editions, not their *use*. D. Van Hulle, 'Exogenetic Digital Editing and Enactive Cognition', 107-18 in the latter volume, is a noteworthy exception; ironically, the paper is included in the theory section. An unfortunate example of how far removed theory and practice can be, is C. Desenclos, 'Early Modern Correspondence: A New Challenge for Digital Editions', 183-200 in the same volume, which omits any mention of existing projects such as *Early Modern Letters Online* (EMLO) and those listed in n. 54.

[584] J.E. McGuire, 'Newton on Place, Time, and God: An Unpublished Source', *BJHS*, 2 (1978), 114-29, esp. 124; id., 'The Fate of the Date: The Theology of Newton's *Principia* Revisited', in M.J. Osler (ed.), *Rethinking the Scientific Revolution* (Cambridge, 2000), 271-95; Dobbs, *Janus Faces*, 139-46; Iliffe, *Very Short Introduction*, 64; J. Henry, 'Gravity and *De gravitatione*: the development of Newton's ideas on action at a distance', *Studies in History and Philosophy of Science*, 42 (2011), 11-27, esp. 23-26; J.A. Ruffner, 'Newton's *De gravitatione*: a review and re-assessment', *Archive for History of Exact Sciences*, 66 (2012), 241-64; the manuscript is CUL Ms. Add. 4003, first published in Hall and Hall, *Unpublished scientific papers*, 89-156.

order in which Newton first wrote, and then reordered his materials. The digital availability of transcriptions then allows the historian to connect his writings with the books he used and the reading traces his own copies contain. It is now possible to match Newton's notes against a vast corpus of digitized early modern texts, thus recognizing what sources he actually consulted. Likewise, by systematically recording the dog-ears from the volumes in his library, we can map his reading practices onto the tens of thousands of notes he took and develop an understanding of how Newton read his books. For a more detailed discussion of how digital availability of manuscripts and transcriptions has enhanced the research presented in this study, I refer the reader to **Appendix C**.

5.3.3 Corpus Newtonicum

This dissertation began from several well-defined hypotheses about the development of Newton's chronological writings and the connections with his other projects, drawing upon existing literature. However, from the in-depth engagement with the materials that their digital availability provided, it turned out that all of these shibboleths had to be reconsidered and eventually overturned. Indeed, historians have tried to trace the development of Newton's ideas, yet without taking into account the complex editorial history of the manuscripts in which these ideas are contained. A systematic recording of all the reading traces in the works Newton owned and used, and subsequent identification with their loci in the manuscript corpus, showed how Newton consulted many more volumes than his library contained upon his death. Also, it became clear that Newton read many volumes simply for the primary sources they provided, often without consulting these sources independently. On the other hand, his reading notes demonstrated his active engagement with some of these and other primary sources, notably Eusebius' *Praeparatio Evangelica* and the writings of Diodorus and Plutarch.

Similarly, the fragmentary state of the manuscript record necessitated a full reconstruction of the order in which Newton composed his writings. This showed how most, if not all of the

manuscripts historians had considered as coherent, were in fact far from that. Even neat writings such as the Keynes 'Original of Monarchies' consisted of several sections, written at different moments and revealing the development of Newton's ideas. Moreover, it also allowed for an embedding of the 'Original of Monarchies' in a much larger project, the 'Originals', which included the 'Original of Religions'. It clearly showed how Newton had continued the work begun with the 'Origines' and never put it down.

The idea that an interest in all things ancient was just what one would expect from a Cambridge don never sat well: Newton's work always served a clear purpose. A close comparison of the finished *Chronology* with the preceding drafts revealed the many last-minute changes he had made, in effect once more recasting his entire project in a different mould. In order to understand what Newton was working on until late 1726, it was necessary to trace back the origins of the various strands that would converge in the *Chronology*, beginning with the 'Origines'. As the genesis of the chapters from the *Chronology of Ancient Kingdoms Amended* that dealt with Babylon and Persia showed, it was clear they had their origins in his study of the prophecies in the book of Daniel, and that the concept of the four monarchies had always been much more prevalent was than apparent at first sight.

None of the research summarized above would have been possible without the presence of digitized manuscripts, digital transcriptions, and online repositories. Having all the relevant materials available allowed for a full-scale comparison across all disciplines Newton was engaged in. Their digital nature allowed for unlimited access, greatly helped by the work that the *Newton Project* editors have put in to decipher and faithfully transcribe even the tiniest of scribbles and the most thorough deletions. Finally, only through the use of the raw Herculean power of tools for digital analysis could these materials be connected and made to reveal their secrets.

5.4 Conclusion

I began this chapter with the posthumous editorial projects that resulted in the *Observations of the Prophecies of Daniel and the Apocalypse of St John* and the *Chronology of Ancient Kingdoms Amended*. A history that had until now remained unwritten, unfolded as a dialogue between a surprisingly large number of editors who each tried to come to terms with the hundreds of manuscripts Newton had left. What the well-meant editorial interventions of John Conduitt, Martin Folkes, Samuel Clarke and the other editors showed, is how both of these works, but in particular the *Observations*, were as much their composition as Newton's. It also showed, once more, that the *Chronology* was not yet finished; had its author lived another year, the end product might well have been very different. I also showed how the editors struggled in trying to understand how the various sections and chapters Newton left were meant to be connected, and how they made their choices based on arbitrary interpretations and assumptions.

In the remainder of this chapter, I focussed on three major changes that have occurred with respect to Newton's writings over the past twenty years, concerning their availability, their accessibility, and the time it takes to read and analyse these writings. Thanks to digitization, most of Newton's manuscripts have become available to a large audience from all over the world. No longer is there a direct need to go and visit the archives, when one can view these manuscripts from everywhere. At the same time, their accessibility has been greatly enhanced due to the transcriptions of the *Newton Project*. What would have been barely legible scribblings in a margin are now presented clearly and unambiguously, understandable to man and machine. And, again, thanks to both digitization and transcription, a large corpus of Newton's writings can now be compared and analysed in the time it would have taken Frank Manuel and Richard Westfall to inspect just a single manuscript.

What this has resulted in are wholly new insights into the coherence and incoherence of Newton's chronological and religious writings, and into Newton's working practices, hitherto

unexplored. The application of sophisticated tools and methods for digital analysis has helped demonstrate clear connections between Newton's reading and writing practices, and the nature of these practices. These have also been paramount in reconstructing the corpus of Newton's chronological writings, showing a clear continuity from his earliest treatise all the way to the final drafts for the *Chronology*. It turns out that Newton's scholarly writings were much closer connected than is apparent at first glance, and that the chronological materials should be understood in the light of his studies of the prophecies in Scripture. This necessitates a re-evaluation of our ideas about how Newton compartmentalized his writings. Clearly, many of these divisions were not his making, but our own, just as some of the collations of Newton's writings were the products their editors. Much like modern historians, Conduitt, Folkes, Clarke, and others each tried to guess what the great man intended with the materials he had left. Even though the black box in which they were kept by the Portsmouths was emptied in the 1930s, its contents remained largely hidden due to their general opacity and worldwide dispersal. But now, that black box is fully open, and what were once the private writings of a rather reclusive individual can be read as they were written.

6. Conclusion

In this thesis, I have presented the narrative of Newton's chronological studies from the bottom up, as a quest in search of the real *Chronology* and the real Newton. There are several reasons for this, as I discussed throughout. Newton's working practices and the structure of his chronological project are intrinsically connected: it is impossible to understand the one without the other. In more than one sense, both stories are worth telling. The study of Newton's working practices has revealed intimate details of a scholar at work, sitting behind his desk reading, taking notes, and writing; wrestling with Ezra, Nehemiah, and the identity of Darius the Mede; expanding, rewriting, ordering, and reordering the histories of ancient Egypt, the Argonautic Expedition, and the Jews in exile. The study of his chronological writings has shown how Newton never abandoned the project he began in the 1680s, and how he perceived the topics of idolatry, monarchies, and the prophecies in Scripture as closely related. It is now time to piece together the various lines and structures this thesis has unearthed, to tell the true story of Newton's chronological studies.

The discipline of chronology had emerged from the Renaissance and matured with Joseph Scaliger and Dionysius Petavius. Three quarters of a century after the publication of their major works, the chronological issues they had been wrestling with had not been solved, in particular in relation to the histories presented by Berosus and Manetho. The four monarchies from the prophecies of Daniel no longer fitted a historical narrative in which – in particular – Egypt's antiquity became more and more prominent, or which sought to include the histories of other parts of the world like India and China. It was amidst these debates that Newton developed an avid interest in the topic. He too had been studying the prophecies, ever since the 1670s, and had made some early attempts to harmonize the histories of Babylon, the Assyrians, the Medes and the Persians, with the records provided by Scripture. He had become particularly intrigued by the visions provided in Daniel and Revelation, and developed ideas that went beyond those of the Church Fathers and the Reformers. If in the vision of the

statue, the stone would come down and destroy all monarchies at once, clearly all of them had to be still present when Christ would return and the Day of Judgment commence. Thus, Newton set himself to task to work out how these monarchies had continued, and what role they would play in the end times.

But there were other aspects of the history of Christianity in which he had become interested, which all revolved around the concept of idolatry. Reading and borrowing liberally from the works of Gerardus Vossius, Samuel Bochart, John Marsham, and many others, he soon developed the idea that all major Mediterranean mythologies had had their origin in Noah and his family, the sole survivors of the Flood and thus the ancestors of mankind. But the original Noachian religion recognised just the one God, of which most of Noah's progeny soon lost sight. Instead, they started to venerate their ancestors, a worship subsequently translated to the Sun, Moon, and stars. Here lay the origin of idolatry. Yet the rites of the ancient Egyptians also showed a keen understanding of the true meaning of these heavenly objects, and the natural laws guiding them.

The above considerations became the *Theologiae Gentilis* 'Origines' *Philsophicae*. Written during the 1680s, it must be considered Newton's first chronological treatise, yet it likely postdates his earliest studies of the four monarchies. Soon the histories of Egypt, the root of all idolatry, became more and more prominent. Following Bochart, he asserted that many of the dynasties in Manetho's list had reigned in parallel, each over a different part of Egypt. What he also tried to show was that Egypt, though it clearly predated the four monarchies, had never been a powerful empire until the days after Solomon, and then only briefly. In the decades that followed, Newton continued working on both projects. The 'Origines' became the 'Originals', with chapters titled 'The Original of Monarchies' and 'The Original of Religion, composed during the first decade of the eighteenth century. Initially relying solely on genealogical data and reasoning, he now incorporated ancient astronomy and precise calculations on the average lengths of generations and reigns. The history of Greece thus became more prominent, as it featured a key event – the voyage of the ship Argo – that could

be dated using the star observations of astronomers like Thales and Hipparchus. In his studies of the prophecies in Daniel and his reconstruction of the kings who reigned over Babylon before and during the Jewish Exile, he also resorted to new strategies. By then he had developed a detailed key with which to decipher the symbolism of Scriptural prophecy, which he employed at great length in his interpretation of the events described in Daniel and Revelation.

That same key made him discard the authority of ancient Jewish historians and of Flavius Josephus, whose solutions to explain the discrepancies between the various historical passages in the books of Daniel, Ezra, and Nehemiah, greatly complicated matters. He now realized that these historians were strict literalists when it came to the history in Scripture: they only recognized those kings mentioned there and even considered similar-named kings one and the same. Instead, Newton went a way diametrically opposed to theirs, first interpreting and then amending Scripture from his reconstruction of the history of the kings of Babylon from profane sources. The Bible was God's Word, but not all words in the Bible were divinely inspired, in particular when it came to chronology. Just like their foreign counterparts, Israel's chroniclers had recorded the history of their people from their own, nation-centred perspective. They faithfully recorded history as it happened to them, and only to them. Thus they wrote down the names of only those foreign kings Israel had dealings with, sometimes mistaking titles for names, and often referring to them using Hebraized and Aramaized names. Their narratives were never meant to contain universal history: absence of evidence was not evidence of absence. It is a similar strategy to the one Newton employed in the 'Origines', where he found ample space to reconstruct the histories of Noah's progeny and the battles they fought from the *Titanomachia*. On the other hand, the words God had spoken to the prophets were sacrosanct, including the chronology they described. The historical facts and allusions in their words were revealed truth, coming directly from God, and thus had to be taken with utmost seriousness.

And so Newton went to great lengths to harmonise the sacred and profane records, in which he did not hesitate to suggest that several parts of the Biblical books involved were now, for various reasons, in the wrong order. As much as he constrained himself by adhering to the narrow timeframe allowed for by the Masoretic version of Scriptures, he made liberal suggestions about how the writings of Ezra and Nehemiah should be understood. It is not that he doubted the veracity of Scripture, but from his studies of the supposed corruptions in the New Testament, he developed a literary criticism towards the transmission history of these books that surpassed that of his contemporaries. For this he found ample evidence in Scripture itself, referring to many works that once existed but had been long lost. Manuscript pages could easily be mixed up, and put back in the wrong order, which he might have experienced first-hand when keeping track of his own writings. Yet what was never in doubt was the truthfulness of the prophetic word. Prophets received their words directly from God, and these words were infallible. The study of these prophecies was a duty, a sacred duty, of every man, learned or not.

Halfway through the second decade of the eighteenth century, Newton decided to integrate his studies of the kings who reigned over Babylon with the 'Originals'. The chronology he had compiled for the 'Origines' had provided him with an absolute timeframe in which to embed all antediluvian history, always with an eye on the four monarchies. He might still have been working on the exact details of the Macedonian and Roman Empires, but key dates of the first and second monarchies, those of the Assyrians at Babylon and the following Median-Persian reign now featured prominently in the timeline for the *Short Chronicle* which he sent to Princess Caroline in 1717. Occupied with other studies such as his detailed exposition of the prophecies in Revelation, the preparations for a second edition of *Opticks*, and the third edition of the *Principia*, Newton was unpleasantly surprised when in the fall of 1725 the *Abregé* appeared. Initially, he responded with just a letter, rebuking his French critics and defending the validity of his methods, but soon set himself the task of providing a full explanation in the form of the *Chronology of Ancient Kingdoms*, possibly with two more volumes on the

prophecies and the history of the Church in mind. At the final hour, he decided that the nearly finished work needed one major overhaul; alas, he died whilst still writing. His editors thus attempted to finish what Newton had begun, and published the last version on which he had been working. It was this version that informed the world of the extensive project to which he had devoted over forty years of his life. However, what his readership saw, and discussed, and rebutted, was but one of the many stages in Newton's ideas about world history, the horrors wrought by idolatry, and the interpretation of the prophecies in Scripture.

It is also this version of the *Chronology* that for a long time was the sole source of information for historians to interpret Newton's writings on the topic. Even with the availability of the Keynes, Yahuda, and New College manuscripts, they still misrepresented what Newton had ultimately been trying to achieve. The 'Origines', the 'Original of Religions', the 'Original of Monarchies', and the *Chronology* all received ample attention, yet, studied in isolation, the coherence of his writings remained shrouded in obscurity. Ideas about compartmentalization, combined with the fragmented nature of the dense Corpus Newtonicum and Newton's often idiosyncratic working practices, prevented historians from seeing the inherent connections between these writings, and between his chronological and prophetical projects.

The digitization of Newton's manuscripts and the transcriptions created by the *Newton Project* have enabled a dramatic change to the world of scholarship. For the first time, the historian has genuine access to Newton's writings, enabling full-scale comparison. As I have shown in this thesis, when we remove our initial assumptions about coherence and compartmentalization, a radically different narrative emerges, a narrative that tells how Newton himself perceived the connections between his writings. As it turns out, his chronological writings were entirely motivated by and subservient to his studies of the prophecies, the only study that really mattered. It is clear that Newton saw past, present, and future as a single, unbroken timeline that involved the religions, cultures, and histories of all people.

From the onset, Newton went his own independent way. Although he consulted the works of many of his contemporaries, he never engaged in public scholarly debate about the topics they discussed. Instead, from the privacy of his study he went to extreme lengths to provide a clear interpretation of the prophecies in Scripture, and a reliable timeline onto which to map the unfolding history of God's plan for mankind.

Appendices

Appendix A: The evolution of the ‘Origines’

In § 3.2.1, I presented a reconstruction of Newton’s earliest chronology-related treatise, the ‘Theologiae Gentilis Origines Philosophicae’. As I showed, Newton turned what was originally an eight-page essay on the Egyptian origins of star worship into a multi-chapter work that included the chronology of the first generations after the Flood, showing how the origins of all Mediterranean civilizations pointed back at Noah and his progeny. In this appendix, I will detail the process of reconstructing the ‘Origines’.

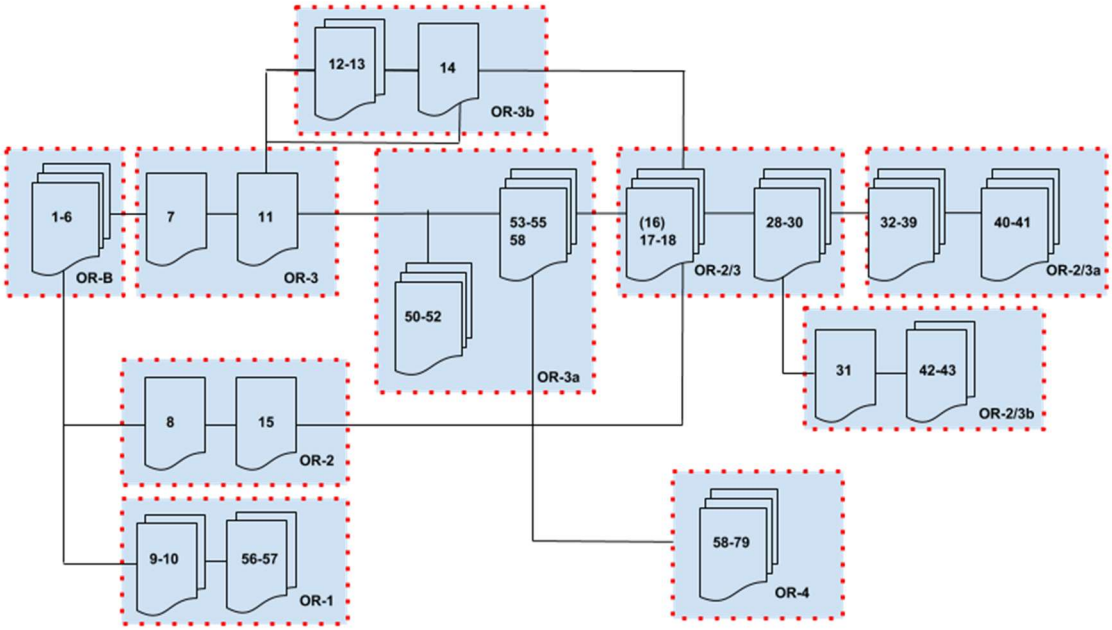
As with some of Newton’s other manuscripts, early editors of the *Newton Project* realised that the order in which the manuscript, which is Yahuda Ms. 16.2, had been foliated and catalogued did not make sense, and decided to transcribe fols. 19^{r}-27^{v} – all in Newton’s hand – as a separate section, thereby breaking up the manuscript in three divisions. However, a much finer divisioning was necessary in order to start the reconstruction process. For instance, the current transcription still has fols. 7^{r}, 8^{r}, and 9^{r} in the same division, whereas they clearly belong to three different versions of the text. Similarly, the large section comprised of fols. 28^{r} to 80^{v} has parts in both Humphrey’s and Newton’s hand, which had to be separated. Within each of the three sections, there are many pages that do not follow upon each other, and are apparently mislaid. Eventually, I decided to systematically divide up the manuscript, differentiating between pages mainly in Humphrey’s and in Newton’s hand. In those cases where the removal of one or more pages lead to a continuing narrative, I included the now restored order in the same division. For instance, upon close scrutiny it turned out that fol. 11^{r} followed fol. 7^{r}, once fols. 8^{r}-10^{r} were removed. With some divisions consisting of short additions by Newton added to a once opposing folio, now no longer there, and others of sometimes a dozen consecutive pages – such as fol. 73^{r} to 79^{r} – I arrived at a total number of forty-four separate divisions.

When – for now – we ignore stray additions, the several chapter headings Newton added on various versos, and some Mint-related lines, I ended up with about two dozen sections of drafts by Newton, and thirteen sections in Humphrey's hand. All the sections in Newton's hand until fol. 58^{r} are either notes for the materials copied out by Humphrey, or belong to the Latin version of the 'Original of Religions', as I have shown in § 3.3.2. The section from fol. 58r onwards consists of Newton's continuation after Humphrey had left his service.

In my reconstruction, I focussed on the text in Humphrey's hand, using Newton's notes in this manuscript and various others to work out the various versions. For example, fols. 48^{r} and 49^{v} of Yahuda Ms. 16.2 contain drafts that return on fols. 50^{r}-52^{r} in Humphrey's hand. The text on fol. 52^{r} ends halfway, with catchwords added by Newton: 'Aurea prima', referring to the Golden Age. The following fol. 53^{r}, again in Humphrey's hand, starts mid-sentence, 'prius exponendae sunt…'. Having deleted these and the next couple of words, the revised page now continues 'Ovidius sic describit: Aurea prima…' From this we can infer a page starting 'Aurea prima' already existed when Newton added the catchwords to fol. 52^{r}. At the same time, with the page ending halfway, apparently these pages did not originally connect. Likewise, from fol. 53^{r} we can infer that this page was originally connected to another page, before Newton placed it here and deleted the first words. Even then, the pages do not fully match, with the 'Ovidius sic describit' not deleted.

Although there were three different folios – 7^{r}, 8^{r}, and 9^{r} – that are closely related in text, a quick inspection of the other materials in Humphrey's hand made it clear that there was only a single preceding folio, 6^{r}. Apparently, at some time Newton decided to rewrite the original page, and then again. Comparing the three shows that fol. 9^{r} was the oldest and hence original version. The text on this page has several superlinear additions that return in the main text of the other two. Similarly, there are additions to fol. 8^{r} that return as main text on 7^{r}. Although fols. 7^{r} and 8^{r} begin and end exactly the same, it turned out that fol. 7^{r} was not simply a replacement for fol. 8^{r} but started a new version. Both fols. 11^{r} and 15^{r} match fols. 7^{r} and 8^{r}, but the additions on the versos made it clear that fol. 11^{r} was once connected with

fol. 7^{r} and fol. 15^{r} with fol. 8^{r}. By comparing the various variants with each other and with draft sections found in other manuscripts, I could eventually reconstruct the relations between the various pages in Humphrey's hand, as illustrated in **Figure 11**, which I have reproduced below.



From fols. 1^{r}-6^{r} (**OR-B**), there are three branches starting with fols. 7^{r}, 8^{r}, and 9^{r}. Fol. 9^{r} is clearly the oldest (**OR-1**), and there are only a few following folios before Newton abandoned this version. With the second version (**OR-2**), Newton reused **OR-B** and had Humphrey made a clean copy of the next folio - there are hardly any differences between the text on fols. 8^{r} and 9^{r} – but from the next folio onwards the text starts to diverge. It is not entirely clear how Newton continued from fol. 15^{r}. Yahuda Ms. 17.2, fol. 14^{v} offers as much as five possible options, with Newton adding, deleting, and rearranging parts of the text, with fol. 28^{r} providing another alternative. The passage returns in the current manuscript at the end of fol. 14^{r} and on fol. 58^{r}, where it appears to be end of a paragraph. However, on this page Newton continued the text in his own hand, starting a new – short – paragraph with the words 'Indi illi <sunt populus Asiæ> inter mare rubrum & fluvium Nilum…' with the same continuation found in a later manuscript. Alas, none of the pages we have in Humphrey's hand starts this way, nor does it seemingly appear among the drafts in Yahuda Ms. 17.2 or

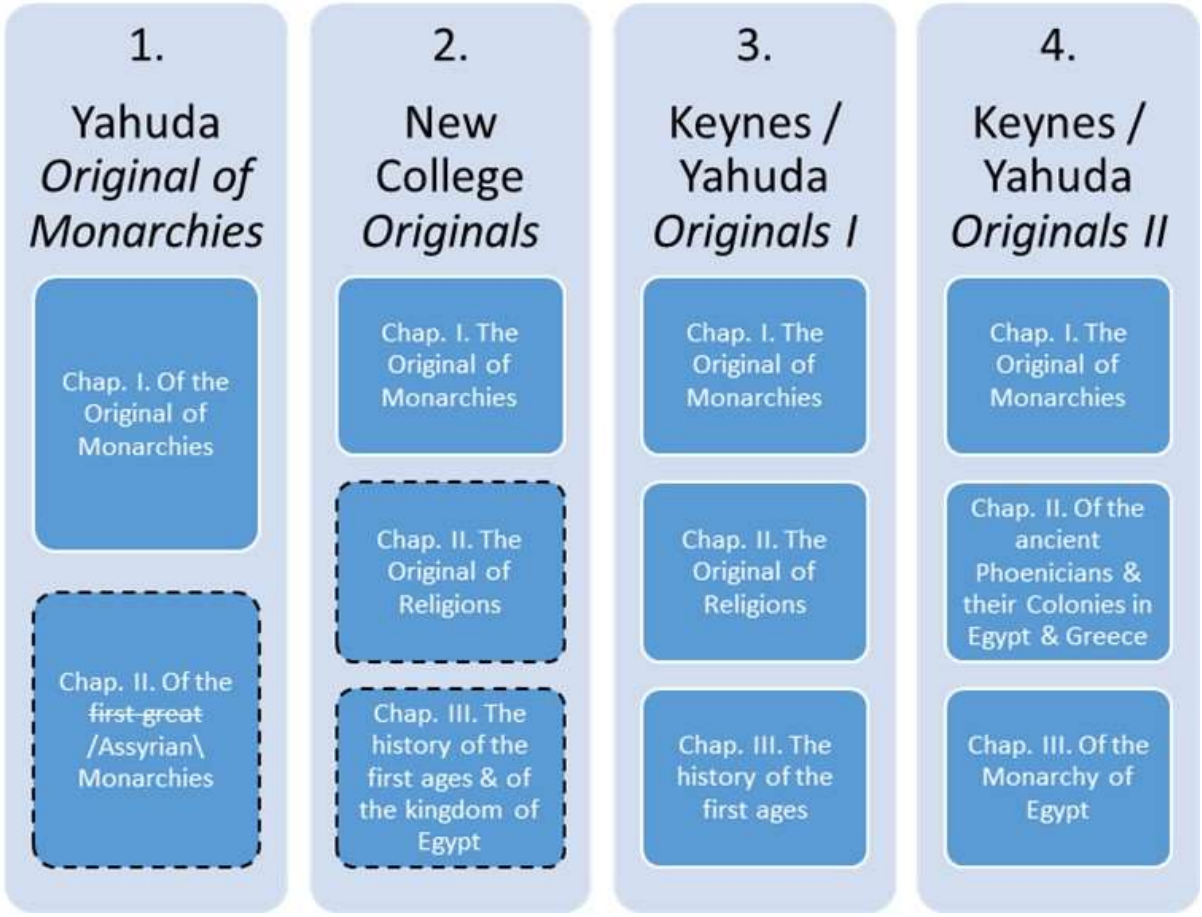
elsewhere. What we do have is fol.17^{r}, starting a new paragraph with 'Orbe inter Saturni filios diviso…', which is Newton's next paragraph on fol. 58^{r}, straight after the passage on India. If we consider the India passage a later addition by Newton, it makes total sense to have fol. 17^{r} follow fols. 14^{r} and 15^{r}, but also 58^{r}. There is a stray fol. 16^{r}, with a passage that partially overlaps with deleted lines on fol. 17^{r}, which should go before fol. 17^{r} but after fols. 14^{r}/15^{r}/58^{r}.

Fols. 15^{r}-18^{r} and 28^{r} ff. are also part of a third version (**OR-3**) which again reused fols. 1^{r}-6^{r} and then continued with 7^{r} and 11^{r}. It is not entirely clear whether Newton first rewrote and added to this part of his treatise before he started writing the material that appears from fol. 28^{r} onwards; what is clear from analysing the manuscript is that fol.17^{r}, with which the text on fols. 14^{r} and fols. 58^{r} connect, existed before these folios were written. **OR-3a**, which continues from fol.11r with fols. 53^{r}-55^{r} and 58^{r}, contains material written before fols. 12^{r}-14^{r} (**OR-3b**), with fols.50^{r}-52^{r} a later addition to **OR-3a**. From fol. 28^{r} onwards Newton started working out the intricacies of the third and fourth generations after Noah, the Bronze and Iron Ages, and there are again two versions. The older – and longer – text, **OR-2/3a**, continues from fols. 28^{r}-30^{r} with 32^{r} ff., while the text on fols. 31^{r}-42^{r}-43^{r}, **OR-2/3b**, starts with a clean copy of the edited text on fols. 32^{r}-33^{r} and expands on this. In the older text Newton drew upon the Titanomachia, the battle of the Olympian gods with the Titans, to establish the identity of Cham's son Phut, a key figure of the third generation. The newer text never reached that point as it rather abruptly ends, though the draft – found in another manuscript – continued for several paragraphs. In a later draft, on fol. 58^{r} of the Origines manuscript, Newton started with another version of the same text, but here he repeated much of the material from the older version on fols. 32^{r} ff. and none of the newer text from **OR-2/3b**. There is no version of Newton's last draft text, **OR-4**, in Humphrey's hand, although the first paragraph on fol. 58^{r}, which connects with fol. 16^{r} ff., is. It seems this is where Humphrey and Newton parted ways, with Newton returning to the text sometime after Humphrey left.

As the above makes clear, reconstructing just the Humphrey parts of the Origines is already a painstaking process, with the scribal copies demarcation points on a timeline of ideas, ideas that would often shift. For instance, fol. 14^{r} is already part of a branch of a third version of the 'Origines', **OR-3b**, originally connected with fol. 11^{r} through fols. 12^{r} and 13^{r}. At some point in the developments of his ideas, Newton decided that the materials covered on fols. 12^{r} and 13^{r} might as well be moved elsewhere, and connected fol. 11^{r} directly to fol. 14^{r} by deleting the original last words and adding a relevant catchword. Likewise, whereas fol. 11^{r} was once directly connected with 53^{r}, Newton decided to add fol. 52^{r} in between, with the original drafts currently preceding the scribal copy. And then there is the section starting with fol. 31^{r}, which someone – not Newton, for sure – decided to remove from the connecting fols. 42^{r}-43^{r} and put together with its deleted counterpart, fol. 32^{r}, similarly to what happened with fols. 7^{r}, 8^{r} and 9^{r}. From this reconstruction it has also become clear that the manuscript is incomplete – there are at least two folios missing. The stray folio 16^{r} is part of a mostly empty bifolio, suggesting that Newton entertained yet another variant continuation. The text clearly starts at the end of a paragraph, and from the drafts we can reconstruct the preceding text, yet there is no matching folio in Humphrey's hand. Similarly, fol. 39^{r} was originally connected to another page: Newton overwrote the last words 'Igitur cum' with 'Jovem' and added a catchword 'intellige' to match fol. 40^{r}. In this case, fol. 40^{r} might be a page from another version, as 'Igitur cum' does occur a few words later, but no other pages originally connected to 39^{r} or 40^{r} are present.

Appendix B: From ‘Origines’ to proto-*Chronology*

The reconstruction of the various intermediate stages Newton composed after the final version of the ‘Origines’ involves folios from dozens of manuscripts. In general, I have relied on a similar methodology as with the reconstruction of the ‘Origines’, focussing on textual comparison to find, connect, and order the various fragments. Of the resulting graphs, found in Chapter 3 and reproduced below, the dashed sections are conjectural, as their identity or relation with the other fragments cannot be established with absolute certainty.

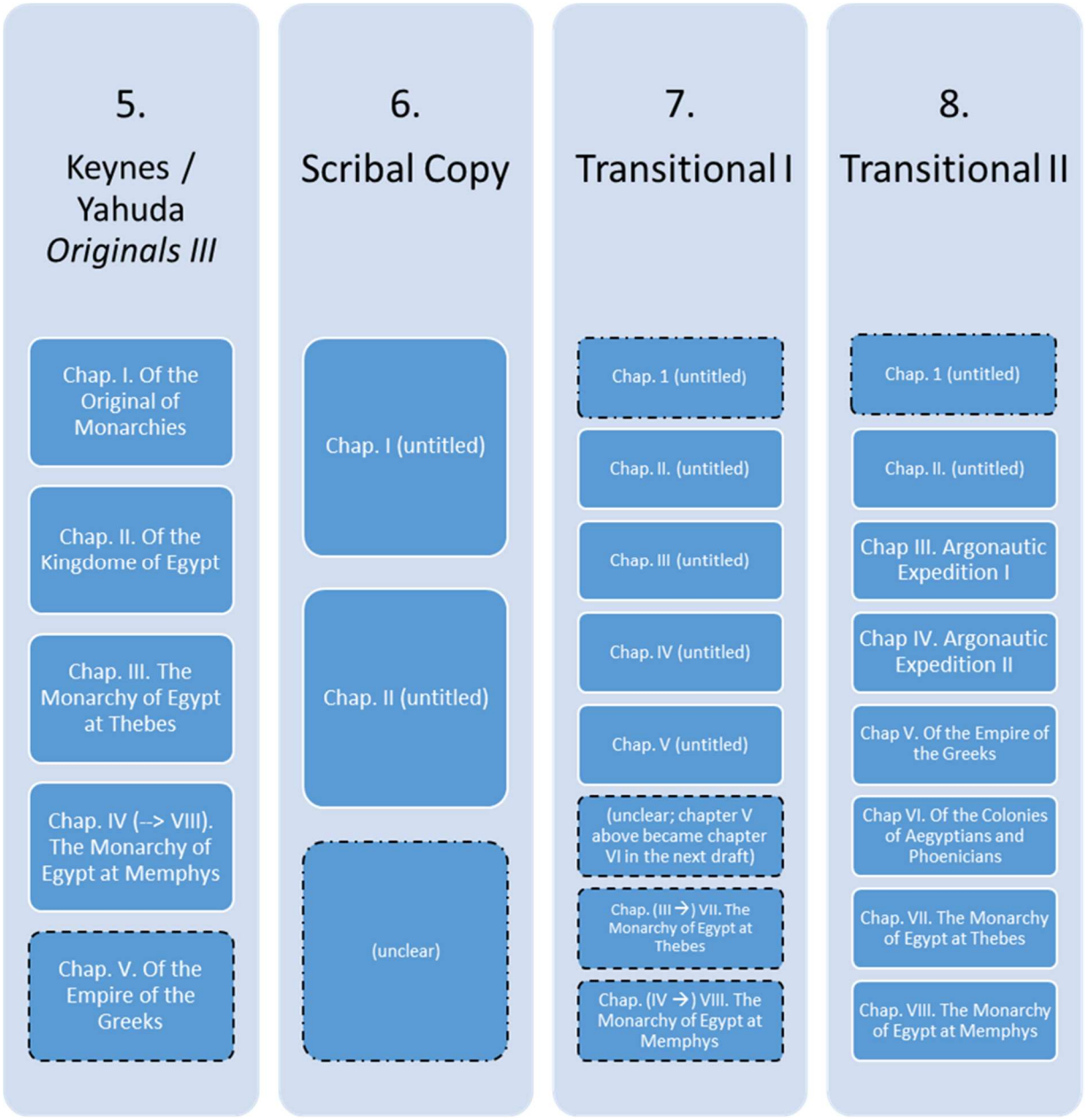


1. **I**: Yahuda Mss. 7.1a, fols. 1^{r}-^{v} & 25.1d, fols. 1^{r}-1^{v}; **II**: Yahuda Ms. 25.1d, fols. 1^{v}-3^{r}.

2. **I**: NCL Ms. 361.3, fols. 93^{r}-95^{v}; **II**: Yahuda Ms. 41, fols. 1^{r}-10^{r}; **III**: ibid., fols. 11^{r}-25^{v}.

3. **I**: Keynes Ms. 146, fols. 1^{r}-14^{r} / Yahuda Ms. 25.2f, fols. 44^{r}-50^{r}; **II**: see **2-II**; **III:** Yahuda Ms. 41, fols. 26^{r}-28^{v}.

4. I: see **3-**I; **II**: NCL Ms. 361.1, fols. 137^{r} ff. / Yahuda Ms. 25.1e, fols. 8^{r} ff.; **III**: NCL Ms. 361.1, fols. 98^{r}-99^{r}.



5. **I**: Keynes Ms. 146, fols. 1^{r}-22^{r}; **II**: '\The Original/ Of the Kingdome of Egypt ~~and chronology of the first ages~~', Yahuda Mss. 25.1e, fols. 3^{r}-10^{r} / 25.2f, fol. 51^{r} / NCL Ms. 361.1, fols. 131^{r}-159^{r}; **III**: Yahuda Ms. 25.2b, fols. 1^{r}-38^{v} / NCL Ms. 361.3, fols. 18^{r}-19^{v}; **IV**: Yahuda Ms. 25.1f, fols. 1^{r}-3^{r} / NCL Ms. 361.3, fols. 187^{r} ff.; **V**: ibid., fols. 22^{r}-^{v}.

6. **I**: Yahuda Ms. 25.2f, fols. 34^{r}-39^{r}; **II**: ibid., fols. 39^{r}-43^{r}; **III**: unclear.

7. **I**: unclear; **II**: Yahuda Mss. 25.1aV, fols. 1^{r}-2^{v} / 25.2e, fols. 1^{r}-6^{r}; **III** Yahuda Ms. 25.2e, fols. 6^{r}-13^{r}; **IV** ibid., fols. 13^{r}-14^{r}, 17^{r}-21^{r}, 24^{r}-28^{r}; **V**: ibid., fols. 28^{r}-39^{r}, 41^{r}-42^{r}; **VI**: unclear; **VII**: Yahuda Ms. 25.2a, fols. 1^{r}-34^{r}; **VIII**: Yahuda Ms. 25.1f, fols. 1^{r}-3^{r}.

8. **I**: unclear; **II**: Yahuda Mss. 25.1aV, fols. 1^{r}-2^{r} / 25.2e, fols. 1^{r}-6^{r}; **III**: 'Chap. III. The time of the Argonautick Expedition stated by Astronomy', Yahuda Ms. 25.2d, fols. 1^{r}-7^{r}; **IV**: 'Chap. IV. The time of the Argonautic Expedition and Trojan War stated by the records of the Tyrians and Carthaginians, & by the ~~expedit~~ reign of Sesostris', Yahuda Ms. 25e, fols. 15^{r}-16^{r}, 17^{r}-21^{r}, 24^{r}-28^{r}; **V**: NCL 361.3, fols. 22^{r}-23^{v}; **VI**: 'Chap VI.Of the Colonies of Ægyptians & Phoenicians who civilized the Greeks', Yahuda Ms. 25.2c, fols. 1^{r}-8^{r}; **VII**: Yahuda Ms. 25.2a, fols. 1^{r}-34^{r}; **VIII**: Yahuda Ms. 25.1f, fols. 1r-3r.

Appendix C: Enter the Digital

C.1 The Newton Project

Originally meant to contain 'just' Isaac Newton's non-scientific writings, anno 2018 the *Newton Project* website contains close to seven million words of transcribed manuscripts, covering all of Newton's many projects.[585] With the alchemy materials, which consist of another 850,000 words, part of a separate but closely connected project, the *Chymistry of Isaac Newton*, the combined transcriptions constitute a still expanding digital edition. These do also contain writings by others, such as letters to Newton, early biographies, and a wealth of contemporary contextualizing materials. Here, for instance, one can read how John Conduitt considered Newton fit for canonization, to which 'he would have had a better claim… than those they have hitherto been ascribed to [since] his virtues proved him a Saint & his discoveries might well pass for miracles.'[586] However, a quick search shows us what Newton would have thought of such an accolade. As he put it in his theological notebook, '[idolatry] is in Scripture condemned and detested above all other crimes.'[587] Instead, Newton argued, 'there is but one Mediator between God & man, the Man Christ Jesus.'[588] These passages, and many more related ones, can be easily found via the *Newton Project*'s search engine. Having all of these sources linked together on a single knowledge site allows us to gain a deep understanding of Newton's thoughts and writings on every topic he ever studied.

The *Newton Project* is first and foremost a digital edition, containing the collected writings of Isaac Newton. These include not just his published works, and his major unpublished treatises, but every single draft Newton ever created, from short snippets with only a few

[585] Iliffe and Young, 'Newton on the Net', 88. See also http://www.newtonproject.ox.ac.uk/about-us/newton-project.
[586] Keynes Ms. 130.14, fol. 1.
[587] Keynes Ms. 7, fol. 1^{r}.
[588] Yahuda Ms. 15.6, fol. 67^{v}.

lines to texts with several hundred thousand words. Whenever available, links are included to digitized versions of the manuscripts, which in turn link back to the *Newton Project*'s transcriptions. The basis for these texts is formed by the manuscript record as it is today, following the order in which the folios have been numbered by their respective archivists, with a handful exceptions. In these cases, the editors considered it abundantly clear that folios had been inserted, breaking up what would otherwise be a continuous and coherent text. Thus, the transcription of the 'Origines' has the text from folios 19 to 27 at the end, as the narrative on fol. 18 continues on fol. 28. As I have shown in Chapter 3, there are many more folios that are in the wrong order, but less obviously so than with this particular passage.

The editors' influence is most notable in the transcriptions of heavily deleted materials, where they provide readings based on their ability to decipher Newton's hand underneath the blots and strokes. By hovering over the text, the reader is informed of how certain the editors are of their choice, or why a particular passage could not be made out. A simple toggle allows the reader to switch between a diplomatic transcription, with all the additions and deletions visible and marked as such, and a normalised version, effectively applying all additions and deletions and rendering the resulting, final text. At times the reader is informed about particular aspects of the manuscript, for instance that pages are blank, or that part of the text appears upside down or in the margin. Most of the information about the manuscript itself, the metadata, can be found in the catalogue, such as its provenance, a suggested date of composition, the various hands in which the text is written, and a summary description of its contents.

In general, the *Newton Project* has adopted a policy of minimal editorial intervention. Excepting translations, which are accompanied by a wealth of information, none of the transcriptions are annotated, or in any way connected with other transcriptions. There is no apparatus with variant versions, as with many printed editions, or a preferred copytext. In a sense, the transcriptions are presented as a barebones but highly accurate copy of the

manuscript text, with only minimal reference to their physical layout, and without any editorial guidance on how the text might be read or understood. This is not due to neglect, or disinterest, but a deliberate approach. Instead of focussing on a select number of texts, the editors of the *Newton Project* have opted to provide as many transcriptions as possible, investing their time and efforts in deciphering and correctly rendering Newton's hand. As such, they make full use of the unlimited capacity of the *World Wide Web*. Due to its very nature, a printed edition can only contain so much material before it becomes too cumbersome to handle, or takes up too much shelf space. Its digital counterpart, again by its very nature, is not limited by the bounds of print or the haptics of handling. It can contain an almost infinite amount of data and still be manageable. Simultaneously, there is no need to prefer one version of the text over another: the reader can simply open multiple transcriptions and compare the various versions available. In fact, here the reader becomes the editor, or the editor-user: he or she makes editorial decisions normally set in stone – or rather, print – by an otherwise disengaged academic. It allows the reader to model an edition, tailor-made to answer a series of topical research questions, an edition that can subsequently be modified to answer new questions, questions often driven by exactly the modificational nature of the edition.

In order to do this, the *Newton Project* allows users to download the XML-files and schema that together contain the marked-up manuscript text and the instructions to the browser on how to display the text on screen. TEI-XML, which is *eXtensible Markup Language* compliant to the standards of the *Text Encoding Initiative*, is the default standard for digital editing today.[589] It allows the editor to provide any textual entity, from single letters to entire sections and chapters, with a tag that contains information about that entity. For example, the *Newton Project* uses the following bit of coding to tag words that Newton added above a line: <add place='superlinear'>words</add>. There are similar tags for every textual element and intervention possible, with the option to add multiple tags to the same bits of texts, for

[589] See www.tei-c.org.

instance a deleted addition, or a paragraph that has been written in another hand. When reading the text in the browser, none of these tags are visible. Instead, through the application of a schema, the browser is instructed to display the text from the XML file in a particular way. Thus the superlinear addition above appears on the screen – in the diplomatic rendition of the text – between a backward and forward slash, slightly higher than the main text; when hovering over it with the cursor, a dialog box appears informing the reader that 'This text [was] added above the line.' Apart from reconstructing Newton's hand and applying mark-up, the *Newton Project* has also developed a bespoke set of symbols that appear in Newton's writings, in particular those related to alchemy such as in the scheme I discussed in Chapter 3.[590]

C.2 Managing and analysing (big) data

One thing the *Newton Project* does not provide yet is a digital workbench and toolkit to create and work with a personal edition, with one exception which I will discuss below. It would have been ideal to just drag and drop various transcriptions, or parts thereof, and collate these, or generate a critical apparatus for a chosen copytext. But despite the number of tools for data analysis that are available on the internet, there is a surprising lack of sophisticated products that do full justice to XML-based texts. More and more tools and methods accept TEI-XML input, but are unable to make much use of the information contained therein and treat the text in the same way as a basic text-file. But when comparing various versions of a text, the reader would greatly benefit from knowing which parts of which text have been deleted, and which parts are additions. In attempt to circumvent these limitations, Wallace Hooper and John Walsh have devised a method to transform XML-files into regular text-files while preserving selected markup. They applied this technique to the alchemical corpus of the *Chymistry* project, which they subsequently queried for similarities using a technique called Latent

[590] J.A. Walsh and W.E. Hooper, 'The liberty of invention: alchemical discourse and information technology standardization', *Literary and Linguistic Computing*, 27 (2012), 55-79.

Semantic Analysis (LSA). After indexing every word in a text and subsequently transforming these texts into mathematical vectors, a series of linear algebraic operations are performed to calculate how closely correlated these vectors are, and thus the underlying texts.[591] As such, they were able to identify the chronological order of two passages from Newton's alchemical corpus, showing how one is a reworking of the other.[592] Hooper subsequently implemented an LSA-tool on the *Chymistry of Isaac Newton* project website, where readers can perform their own analysis on the alchemical corpus.[593]

It is important to note that techniques such as LSA, and its supposedly superior relative LDA, Latent Dirichlet Allocation, are still under development, in particular when it comes to topic modelling: the automatic classification of topics found in a corpus. A recent study into the reliability of these techniques applied to various corpora shows that there is still much room for improvement.[594] However, once a corpus has been categorized according to topic by other means, LSA might help in defining how closely related particular manuscript pages are. Obviously, one always has to weigh the pros and cons of methods for analysis based on the nature of the corpus at hand. The *Newton Project*'s transcriptions were created with accuracy in mind, accuracy in mimicking the written text, that is, its contents, as closely as possible. Thus, where Newton made a writing error and corrected this by overwriting the mistake, or inserting a missing letter, this is reflected in the code. As a result, two identical passages might not be recognized as such by tools for data analysis. For example, at times Newton erred in writing down the name 'Cinyras'; instead, he wrote 'Cyniras', which he subsequently corrected

[591] See N.E. Evangelopoulos, 'Latent Semantic Analysis', *Wiley Interdiscip. Rev.-Cogn. Sci.*, 6 (2013), 683-92, esp. 684-88, for a concise technical explanation of LSA and its applications.
[592] J.A. Walsh and W.E. Hooper, 'Computational Discovery and Visualization of Semantic Structures in Historical and Literary Corpora: *The Chymistry of Isaac Newton* & *The Algernon Charles Swinburne Project*', *Digital Humanities* (2011), n.p.; the passages are Cambridge Mss Add. 3973, fol. 32^{v}, and 3975, fol. 142^{r}.
[593] http://webapp1.dlib.indiana.edu/newton/lsa/index.php. See also L. King et al., 'Word-level language identification in *The Chymistry of Isaac Newton*', *Digital Scholarship in the Humanities*, 30 (2015), 532-40, esp. 535.
[594] A. Lancichinetti et al., 'High-Reproducibility and High-Accuracy Method for Automated Topic Classification', *Physical Review X*, 5: 011007 (2015), 9.

by overwriting both the y and i. The project's editors have faithfully reflected this in their coding by using the appropriate <add> and <del> tags. Since these now appear in the middle of a name, once for every deletion and subsequent addition, the two versions look quite differently, and this cannot easily be amended by just leaving out the tags, as the name would then be rendered 'Cyiniyras'. This can be circumvented by making use of both XML-tagged transcriptions and text-files, comparing these whenever necessary. By subsequently combining these with the manuscript images and notes on Newton's dog-ears, connections can be established between text and image, print and digital.

C.3 Zooming in, zooming out

In 2004, Google Inc. introduced *Google Library*, soon rebranded as *Google Books*. A historian's dream, *Google Books* is a massive digitization project which includes, amongst others, hundreds of thousands primary sources, which have been scanned using a technique called Optical Character Recognition (OCR) and can be queried and downloaded. Although *Tesseract*, the engine developed by Hewlett Packard in the late 1980s and used by Google since 2006 to perform the actual character recognition, has its limitations when it comes to historically types and layouts, the results Google has produced are actually surprisingly good – in particular when queried using Google's own search engine – and incredibly useful for historical research.[595] Apart from being open access, one of the advantages of *Tesseract* is that it can be trained to recognize every font, layout, and language in existence, which was used to its full advantage by Laura Mandell and her team at Texas A&M University. Between 2012 and 2016, Mandell headed the *Early Modern OCR Project, eMOP*, which developed and applied OCR to the nearly 140,000 digitized works found in *EEBO*, *Early English Books*

[595] M.K. Chalmers and P.N. Edwards,' Producing 'one vast index': Google Book Search as an algorithmic system', *Big Data & Society*, 4 (2017), 1-16; D. Leonardo, 'Google Books: primary sources in the public domain', *Collection Building* 31 (2012), 103-7, esp. 103-4; R. Smith,' An Overview of the Tesseract OCR Engine', *Proc. Ninth Int. Conference on Document Analysis and Recognition (ICDAR), IEEE Computer Society* (2007), 629-33; for Tesseract, see also https://github.com/tesseract-ocr.

Online, thereby greatly improving their usability.[596] Both *eMOP-EEBO* and *Google Books* are effectively databases that can be queried about any topic, offering a scholar a wealth of resources. Obviously, they do not contain every single book ever printed, but still they are surprisingly useful in tracing the sources of Newton's references. As I have shown in the second chapter of this study, Newton often copied out the references provided by other scholars, including these as notes in his own writings, often without having consulted the original source himself.

The systematic approach of the corpus of Newton's chronological manuscripts has revealed much about Newton's writing and editing strategies, and about our often misguided historiographical treatment of these manuscripts. This is most clearly illustrated by the 'Original of Monarchies'. From the analysis I presented, we know now that the corpus contains not two, but at least five distinct versions of the 'Original'. In fact, one of the two previously recognised versions, the New College fragment, is indeed only a fragment, with most of the surrounding materials drafts for the *Chronology* and composed much later. What was always seen as a later version of the Keynes 'Original' is in fact part of one of the oldest drafts for the chapter. The Keynes 'Original', on the other hand, turned out to be less coherent than was obvious at first sight. The variant version of the second half, which I found by comparing the first few words of all folios in the corpus, turned out to be the older and hence original continuation, which Newton subsequently rewrote.

The most significant result here is probably the inherent continuity of the chronological Corpus Newtonicum. When we ignore the partial reordering of the manuscripts by others, the reason why so many folios have ended up with other folios than the ones they were originally connected with, is because of Newton's continuous reuse of these materials throughout the forty years he studied chronology. One example of this are the stray folios from the 'Original of Religions' found in the 'Origines'. From an analysis of the full corpus, it was clear that these

[596] See http://emop.tamu.edu.

headings returned in none of his scholarly writings, apart from the 'Original of Religions'. It also means that one cannot study Newton's writings without studying his working methods. Likewise, one cannot study any of these writings in isolation: everything is connected.

As I have shown in Chapter 4, this connectedness goes beyond the chronological papers. From analysing all of Newton's writings on Assyria, Babylon, Persia, and Media, it soon became clear that the full chapters on these empires arose not from the 'Originals', but from his studies of the prophecies in Scripture. In particular the concept of the four monarchies turned out to be of pivotal importance, despite the fact that it does not appear in the *Chronology*. But then, as I have also shown, Newton amended the *Chronology* to answer his French critics and obscured much of his original research. Having sorted out and ordered the materials related to the 'Originals' and to the *Chronology* as Newton composed it before November 1725, a discontinuity presented itself. Whereas the chapters on the Greeks, the Latins, and Egypt which he prepared for the *Chronology* expanded on his treatment of these monarchies in the 'Originals', the other chapters seemingly appeared out of nothing. However, a full corpus search soon revealed their origins in Newton's writings on the prophecies of Daniel, where the four monarchies returned. This suggested a much closer connection between his chronological, prophetical, and church historical writings than suggested by existing literature. By including all of Newton's writings on the four monarchies and Daniel and taking into account the relevant non-transcribed sources, soon a clear pattern emerged that showed that the *Chronology* in fact combined the materials Newton had amassed for his studies of the prophecies with the timeline he had developed in the 'Originals'. It also provided a plausible explanation for why Newton had become interested in chronology in the first place. After all, Newton never wasted time; the remarks in his letter of November 1725 to the Royal Society, that he used to sometimes 'refresh' himself with history and chronology, when he was 'weary' with other studies, would not have convinced his contemporaries, nor should they convince us. The manuscript record speaks of a man who put in serious and devoted study of the topic, as he did with every other topic he was interested in. Again, this devotedness only

becomes clear when we study the entirety of the chronological corpus, and study that corpus in the context of all of Newton's other writings.

This radically new type of scholarship demands a clear grasp of the possibilities and limitations of digital editing and data analysis. Many tools are still unable to deal with marked up texts such as the transcriptions of the *Newton Project*, thereby necessitating the preparation of several datasets containing essentially the same texts, in different formats. At the same time, it is important to realise that not all is digital. There are several manuscripts, even among the chronological Corpus Newtonicum, that have not yet been digitized, or transcribed. These still need to be consulted in the classical way, although with knowledge of the digital corpus in mind and at hand. The same holds for online repositories such as *Google Books*, that do contain many, but not all, relevant, sources.

Although digital history is a methodology, and not a goal, it does more than just enhance existing scholarship. Indeed, in many ways it does, as I have showed, by making existing materials available, accessible, and analysable. But it also allows for new ways of handling texts and materials, because it deals with digital, instead of physical, entities. For example, Newton's writings have been digitized according to their arrival designation, and transcribed as such. Yet every Newton scholar knows that this designation is arbitrary, having little to do with Newton and everything with the posthumous history of his manuscripts, just like the *Chronology* and the *Observations*. There is no longer any need to limit ourselves to the limitations of the physical, either archives or manuscripts. Knowing that the manuscripts are in disarray, reconstructing their order of composition is a requirement to fully understanding the development of and connections between Newton's many projects. At the same time, the digital allows what the physical can never: multiple ordering principles applied to the same corpus at the same time. Thus, the researcher's digital desk can have one edition of Newton's chronological manuscripts in the order in which Newton composed them, a second in which Newton ordered them, and a third in the order in which they are now, and use any of these depending on the research question at hand.

Digital history demands a profound change in historiography. With the accumulation of digitized materials, using these is no longer an option, but an obligation. The historian simply cannot afford to ignore all these materials - but why should he or she? They offer an opportunity to do research to a degree never done before, from the longest *longe durée* to the smallest minutiae. Yes, in order to analyse and draw meaning from these materials, the historian needs to become familiar with sophisticated tools for data analysis, preferably even be involved in improving these and creating new ones. Likewise, there is a challenge to connect with existing scholarship that does not lend itself easily to digital history. But the results far outweigh the costs.

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The Casebooks Project	http://www.magicandmedicine.hps.cam.ac.uk/
The Chymistry of Isaac Newton	http://chymistry.org
Circulation of Knowledge and learned practices in the 17th-century Dutch Republic	http://ckcc.huygens.knaw.nl
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Early English Books Online (EEBO)	http://eebo.chadwyck.com/home
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Google Books	https://books.google.com
King James Bible	https://www.kingjamesbibleonline.org/
London Lives	https://www.londonlives.org/
New Advent: Fathers of the Church	http://newadvent.org/fathers/
NIV	https://www.biblegateway.com
The Newton Project	http://newtonproject.ox.ac.uk
OCD	http://classics.oxfordre.com/
ODNB	http://www.oxforddnb.com
Old Bailey Online	https://www.oldbaileyonline.org/index.jsp
Perseus Digital Library	http://perseus.tufts.edu/hopper/?
Republic of Letters	http://republicofletters.stanford.edu/
Tesseract	https://github.com/tesseract-ocr
Text Encoding Initiative	www.tei-c.org

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