

CHAPTER 8

Harmonia Temporis: Calvisius and Musical Chronology

Today we remember Seth Calvisius almost exclusively for his work as a musician: as an industrious and capable Cantor of the Thomaskirche, as a pioneering composer of sacred vocal music, and as an original music theorist instrumental in transmitting the teachings of Zarlino to his German readers. But most contemporaries of Calvisius would have likely found this picture quite incomplete. For above all, Calvisius was during his lifetime renowned as a great chronologist. During his tenure in Leipzig, Calvisius spent far more energy in his chronological works than on his musical publications, and his extended correspondence with intellectual figures across Europe was almost exclusively about chronology and astronomy.

Those of us today who know Calvisius primarily by his musical compositions and theoretical writings might be surprised by this attention given to his work as a chronologist. Yet for any literate observer of his own day, there would have been no surprise whatsoever. Historical chronology—the scholarly science of dating and ordering Biblical and civil history—was one of the most venerable and widely-practiced disciplines of study in the 16th and 17th centuries, attracting legions of practitioners, most notably the brilliant Huguenot polymath, Joseph Scaliger, but also astronomers such as Johannes Kepler and Isaac Newton. Even a number of music theorists prior to Calvisius had tried their hand in historical chronology, including, Hermannus Contractus, Regino von Prüm, and Heinrich Glarean.

In this article, I want to examine Calvisius's work as a chronologist and attempt to understand why the problems of dating Biblical and civil history might have been of interest to a music theorist. (Although it might almost be as appropriate to ask why a chronologist such as Calvisius would have had an interest in music theory!). To do so, we must begin with a clear understanding of what chronology was.

1

Chronology possesses a distinguished lineage traceable at least to Roman antiquity, where writers such as Ovid, Censorinus and Eusebius attempted to construct comprehensive historical calendars of significant civil events and personages.¹ For these Roman writers, it was felt necessary to establish a temporal calendar of Roman history ascertaining its mythic origins as well as validating its civil lineage of Emperors. When later Christian writers such as Jerome and Issador took up the mantle of chronology, the stakes were of course much higher; they sought to establish a time line for Biblical and Church history to which pagan and civil history could be integrated and ultimately subordinated. Yet Biblical time-lines proved

¹ For a useful introduction to the science of historical chronology, see Anthony Grafton, *Joseph Scaliger: A Study in the History of Classical Scholarship*, 2 vol. (Oxford, 1983, 1993), especially volume 2, pp. 1–18.

maddeningly difficult to reconcile with the histories of Greek and Roman writers; many of the most famous events depicted in the Pentateuch—above all, Noah's flood—received precious little confirmation in pagan history, while the time line afforded by Biblical calculations of creation left little room for the rise and fall of the great civilizations of Babylon, Egypt and Persia described by Herodotus.

Still, by the time of the European Renaissance, the writings of antiquity were gathered and translated by the Humanists into increasingly more reliable editions. As Biblical hermeneutics became more sophisticated, a comprehensive timeline of Universal History was slowly being pieced together that attempted to harmonize biblical and pagan histories. Most importantly, several new tools became available to chronologists, above all from the hands of astronomy. Great strides had been made in understanding and calculating recurring celestial phenomena, including the cycles of comets, lunar and solar eclipses, and planetary conjunctions.² Since many historical events were often linked with some specific astral occurrence, it was often possible to conjecture a fixed date using the *computas*—the various tables of astronomical data that were calculated backwards for thousands of years. Combining as it did the latest advances in astronomical science and mathematical calculation with the disciplines of philology and literary humanism, historical chronology in the late 16th century stood at the forefront of progressive knowledge, and it is not surprising that it attracted such an avid following. For the American historian Anthony Grafton, historical chronology in the Renaissance constitutes a “lost continent of erudition” in Western intellectual history, one whose scope we are only recently beginning to appreciate.³

II

It is not entirely clear how Calvisius himself became so learned in the discipline of chronology. His earliest training, as we know, was in music. Yet according to his Necrology, Calvisius early on showed a strong intellectual propensity.⁴ While working in Pforten at his first cantorial position, he evidently mastered Hebrew and Greek, and gained some knowledge of astronomical sciences. Critical to his growth was his encounter with Joseph Scaliger's

² Anthony Grafton, “Some uses of Eclipses in Early Modern Chronology,” *Journal of the History of Ideas* 64/2 (2003), pp. 213–29.

³ Grafton, *Joseph Scaliger* (vol. 2), p. 6.

⁴ Information on Calvisius's life is taken from the Nekrolog that was introduced as a preface to some later editions of his *Chronologica*: “Programma Rectoris Academiae Lipsiensis in Fundus B. Autoris” (4 pages, non-paginated, dated Nov. 27, 1615; see citations below, note 13); as well as Calvisius's own biographical statement which was included in the Appendix *Operis Chronologici Sethi Calvisii* of the 1685, fifth-edition of his *Opus Chronologicum*: “Apologia sui instituti adversus ejus obtrectatores. Ad Academiae Lipsiensis proceres” (pp. 1–4). Most of this information is reported and easily accessible in the article by Kurt Benndorf, “Sethus Calvisius als Musiktheoretiker,” *Vierteljahrsschrift für Musikwissenschaft* 10 (1894), pp. 411–70.

monumental tome of historical chronology, *De emendatione Temporum* of 1583⁵. Scaliger's book is rightly considered to the foundation of modern chronology, combining as it does his unparalleled sophistication in ancient and biblical history, literary humanism, philological expertise, astronomy, and an extraordinary command of ancient languages and calendar systems. It seems that it was Scaliger's book more than anything else that inspired Calvisius to embark upon his studies of chronology, all the while, of course, maintaining his regular duties teaching at the Thomas School, to which he had moved in 1594.⁶

I will return in a moment to consider what it was that might have attracted our young music cantor to the intimidating science of historical chronology. But for now, we may simply note that by the turn of the 17th century, Calvisius's work had progressed enough that he was able to have published his own monument of historical chronology, the *Chronologia*, which went through seven editions—the last one appearing in 1685, some 70 years after his death—and established Calvisius as a major name in the burgeoning field of chronological studies⁷ (See Example 1). None of his musical writings, we should note, could be said to have enjoyed such renown. It cannot be emphasized enough that Calvisius's fame on the continent throughout the 17th century rested upon his work as a chronologist, not as a musician. The handsome memorial portrait of Calvisius engraved by Conrad Grahl in 1616 (and appended as a frontispiece to later editions of the *Opus chronologicum*) is clear testimony to the esteem to which Calvisius's work as chronologist was held by his peers (See Example 2). Note that in the inscription within the oval encircling his portrait (in which Calvisius is clearly seen holding a copy of the *Chronologia*), "astronomus" and "chronologus" precede "musicus" and "poeta" as professional titles. The accompanying bathetic pangyric also stresses his work as chronologist.⁸

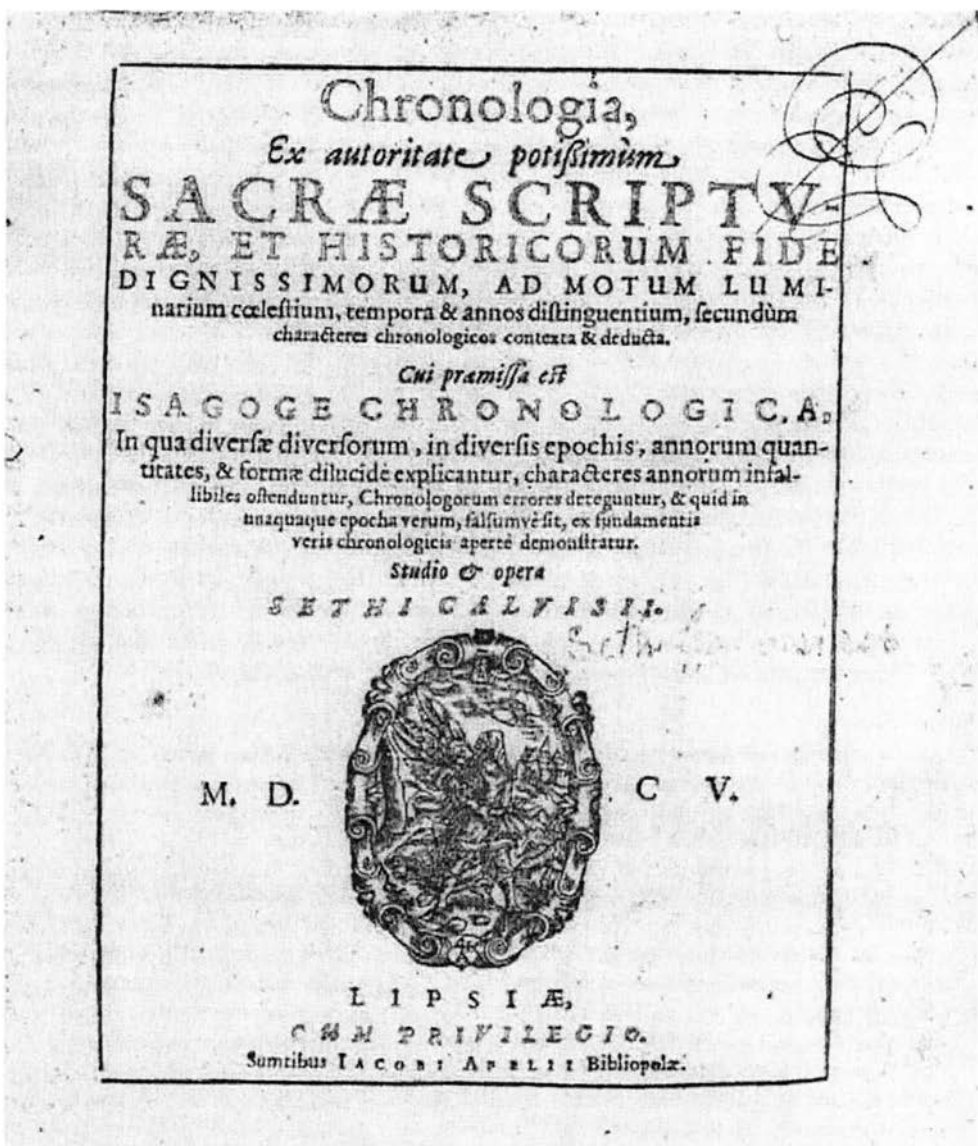
⁵ *De emendatione temporum / Iosephi Scaligeri Ivlii Caesaris f. Opvs novvm ... octo libris distinctum in quo praeter dierum civilium, mensium, annorum & epocharum cognitionem exactam ... priscorum temporum methodus, ac novorum annorum forma ... proponitur, omnibus politioris literaturae, imprimis historiarum & philosophiae studiosis vtile & necessarium* (Frankfurt, 1593).

⁶ From the *Programma Rectoris* of Calvisius (see note 4 above): "Praeter artem vero Musicam, initia quoque Hebraeae Linguae, in eadem Scholae pie defunctus docuit, operamque in eo genere navavit discentium studiis utilissimam. Sed cum maxime Historiarum lectione delectaretur, simul animum ad Chronologiae stadium applulit, & quicquid temporis ab ordinariis laboribus reliquum ei fuit, id solum eo contulit, ut illius scientiae fontes veros ex JOSEPHI SCALIGERI, viri incomparabilis, eruditissimis libris, de emendatione temporum hauriret. Coepit ergo tum rudimenta ponere Chronologici operas egregii, quod postea consummatum hic Lipsiae, non sine magna doctorum omnium approbatione in lucem prodit."

⁷ *Chronologia, ex auctoritate potissimum Sacrae Scripturae, et historicorum fide dignissimorum, ad motum luminarium caelestium, tempora & annos distinguendum, secundum characteres chronologicos contexta & deducta. Cui praemissa est Isagoge chronologica ... studio & opera Sethi Calvisii* (Leipzig, 1605). It should be noted that subsequent editions of the *Chronologia* altered the title to *Opus chronologicum*, with some important additions that I will discuss briefly below in note 13.

⁸ The pangyric (by a W.P. Kilian) reads as follows:

Charta habet Effigiem hic Calvisi; dextera Librum,
In quo Calvisium Terra Polig, Vident
Patria vidit eum: Sed eum tam Patria vidit,
Quam Peregrinorum Lumina clara vident,
Terra Virum deflet! Deflent! Hunc Sidera! Deflent
Tempora! Deflent Hunc Musica, Castra Virum!



Example 1: Title page to *Chronologia*, 1605 (University of Chicago, Special Collections)



Example 2: Engraved portrait of Calvisius from the 1629 edition of the *Opus chronologicum* (University of Chicago, Special Collections)

And this fame was well deserved, for the *Chronologia* is indeed an extraordinary work. Clocking in at some 1200 folio pages, it offered the most comprehensive universal history then published, integrating both biblical and civil histories, even if it did heavily draw upon earlier writers. Beginning with the moment of creation (which Calvisius, following Scaliger, had placed precisely on October 26, 3949 B.C.), Calvisius attempts to record and correlate every major milestone of human and sacred history he can find: the dates of virtually all significant personages or events mentioned in the Bible, the ascensions of Kings and Emperors, births and deaths of church fathers, important battles, discoveries, publications, marriages, Papal Bulls, major Feast days of the church, royal edicts, and conversions. So to offer only a sampling: we learn that Cain was born just 325 years after creation, that is, anno mundi (a.m.) 325, and died some 910 years later in 1235; Noah's flood, we read, took place in a.m. 1656 (on Nov. 28 to be precise);⁹ the construction of Solomon's temple was in 2933, while the first Peloponnesian war took place in 3519. After the birth of Christ which Calvisius initially dated at 3947 years after creation (he would later change his mind about this), the *Chronologia* increasingly is filled with dates of civil and pagan history along with dates relating to the Patristic fathers. By the Carolingian period, Calvisius is able to offer scores of events to record for every single year, leading right up to the year of the book's publication.¹⁰ If the dating of Calvisius seems often speculative, particularly in regard to Biblical history and antiquity, the work is still impressive for its audaciousness in trying to capture within one volume the whole of history, sacred and secular. As the most accessible and comprehensive historical almanac of its time, the *Chronologia* was truly one of the great coffee-table books of the 17th century.

The sources that Calvisius drew upon for his learned compendium are truly breathtaking in scope. He seemed to have scoured just about every published history available to any learned Humanist in the late 16th century: Greek, Roman, Hebrew and Christian. Simply reading through and extracting dates from the hundreds of sources that he cites would have been a lifelong project for any industrious scholar.¹¹ But there was more.

⁹ Here, as elsewhere, Calvisius modified some of these dates in later editions based on new evidence or recalculations. Hence for the deluge, his second edition (1620; full citation below in note 13) lists the date as December 12, 1657 (a.m.).

¹⁰ The *Chronologia* reaches the year 1602 (a.m. 5551), presumably the date in which Calvisius turned over the manuscript to his printer.

¹¹ As one more example of Calvisius's broad intellectual talents—and of his scholarly productivity—I might mention here briefly the publication of a lengthy Latin Thesaurus from 1610: *Thesaurus Latini sermonis, ex optimis quibusque Latinitatis autoribus congestus, et in locos communes, secundum naturalem rerum seriem, digestus*, Leipzig, 1610 (as well as later editions). In this impressive, 930-page volume, Calvisius offered translations and synonyms in Latin (probably drawn from the many Latin sources that he consulted for his chronological work) for thousands of German words, expressions, and commonplaces, each ordered by discipline (Theology, metaphysics, science, the arts, etc.). If it is hardly his most original work, the volume still testifies to his linguistic prowess and intellectual energy that he retained to the end of his life.

| SECVLVM TEMPLI PRIORIS. | | 257 |
|-------------------------|--|-----|
| 1129 | <i>Procas 14. Latinorum rex regnat annis 23.</i> | 819 |
| 1140 | <i>Ufias anno vicefimo feptimo Ieroboami fufcipit habenas imperii, vir fortis & induftrius agriculturam reditus regios auget, parfimonia ærarium fuetur, urbes munie, ædificiis ornat, & militarem difciplinam ordinat.</i> | 808 |
| 1148 | <i>Lacedæmonii Argivos ob Amyclia bello infeflant, multisque cladibus afficiunt Eufeb.</i> | 800 |
| 1150 | <i>Athenienfium & Peloponnefiorum acerrimum confliclus, quo ex utraque parte tanta cladibus affefli funt, ut feffitandem bello, facili arma deponerent. Reinerus.</i> | 798 |
| 1151 | <i>Sarrafenes Medorum & Affyriorum rex. Diodorus Siculus</i> | 797 |
| 1152 | <i>Hofean Propheta, qui tempore Ieroboami pofterioris, regis Ifrael & temporibus Ufia, Iotham, Ahas & Ezechia regum Iuda annis feptuaginta docuit, incipit, Holec 1. verf. 1. Ioël Propheta videtur Prophetam Amos præceffiffe arare. Siccitatem enim primo capite prædicit, quam Amos cap. 4. fruflra eveniffe nec homines ad poenitentiam adegiffe quæritur.</i> | 796 |
| | <i>Amos biennio ante terræ motum, five etiam ante tumultum & motus bellicos, qui mortem Ieroboami fecuti funt docuit.</i> | |
| 1154 | <i>Ieroboamus cum veteres Ifraëlitæum regiones & terminos reftituiſſet, & vini Syrorum retudiſſet, moritur. Secutum eſt in eoregnum viginti trium circiter annorum.</i> | 794 |
| | <i>Amulius 15. Latinorum rex Numitore fratre ſeniore detrufo, regnum occupat & adminiftrat annis 42. Dionyf.</i> | |
| | <i>Meſtodi feclum paululum ante Olympiades collocatur à Solino, alii aliter.</i> | |
| 1174 | <i>OLYMPIAS PRIMA ACTA, die 23. Iulii, feria tertia & curſu tantum certatum fuit, quo vicit Cloræbus Eleus.</i> | 774 |
| 1176 | <i>Arſ ſuſpendi marmoris inventa. Plinius lib. 36. cap. 1.</i> | 772 |
| 1177 | <i>Zacharias abnepos Iehu regis Ifraël in regni ſolio collocatur anno tricelimo octavo Ufia. Verum regni poſſeſſione & vita ſpoliatur ſexto menſe regni, à ſeditioſo quodam Sallum, qui regnum paricidio partum poſt menſem cæde amittit.</i> | 771 |
| 1178 | <i>Manahem audita regis cæde & Sallumini ſerpeia, inter-</i> | 770 |

K k

lectores

Example 3: Page from the *Chronologia*, 1605 (Universitätsbibliothek Leipzig)

The *Chronologia* was not just a compilation of earlier writers; it offered real empirical contributions to the science of historical dating. In his lifetime, Calvisius had mastered the science of astronomy well enough that he was able to calculate the precise dates of some 150 historical solar eclipses so that given historical events that were often linked to observations of eclipses could likewise be dated with more precision.¹² So for example, Calvisius dated the

¹² *Apologia*, p. 1. "Non parvo hæc res mihi conſtitit labore, ut qui ultra centum & quinquaginta eclipses, quotquot, ſcilicet hiftorici meminerunt, quibus res geſtas, quaſi certiffimo caractere & nota inſigniverunt.

famous eclipse predicted by Thales of Miletus—whose occurrence so terrified and astounded the Medes and Lydians, according to Herodotus, that they ceased their hostilities—at *anno mundi*, 3342. Calvisius also calculated solar and lunar cycles for each year, correlating these to the many differing calendar systems that were analyzed by Scaliger.¹³

Upon the publication of Calvisius's *Chronologia*, our author was soon received into a scholarly world of letters that must have been exhilarating for our music Kantor. Almost immediately, Joseph Scaliger wrote to Calvisius, praising the younger man's publication, and initiating a correspondence that would last until the death of Scaliger some four years later.

(Calvisius, incidentally, was one of the few chronologists whom Scaliger truly admired and whose council Scaliger often sought—no small complement for Calvisius considering the former's oversized ego and notoriously prickly personality.) Letters poured in from around Europe asking Calvisius's advice on matters related to the dating of Biblical, Eastern and Persian history, while offers of a professorship in mathematics and astronomy came in from both Frankfurt and Wittenburg.¹⁴ Never again would a Kantor of St. Thomas enjoy such widespread prestige as a world scholarly figure.

ad calculum revocare, suis temporibus, annis, mensibus, diebus, & horis restituere coactus sum."

¹³ How much new dating using astronomical findings is actually present in the 1605 edition of the *Chronologia* I have not been able to determine. But it is certain from Calvisius's correspondence that he continued to pursue his chronological and astronomical studies after 1605 with a clear eye towards a second, expanded edition (see notes 14–16 below). Alas, he never lived to see this through. A second edition of the *Chronologia* would appear only in 1620, some five years after his death. Still, he had obviously made considerable progress in the last ten years of his life with his astronomical calculations—particularly in the dating of solar eclipses. The editors of the 1620 edition were able to announce the inclusion of much new material (now expanded from a quarto to a ¾ folio edition, and with another 200 pages on top of that), as is clear from the new title: *Opus chronologicum, ex auctoritate potissimum sacrae scripturae et historicorum fide dignissimorum, ad motum luminarium coelestium, tempora & annos distinguendum, secundum characteres chronologicos contextum, trecentis fere eclipsibus annotatis confirmatum, & deductum usque ad nostra tempora. Cui praemissa est Isagoge chronologica, in qua cum tempus astronomicum de numerandis motibus luminarium coelestium, & eorundem Eclipsibus, tum diversae diversorum in omnibus Epochis annorum quantitates et formae dilucide explicantur ..., characteres infallibiles ostenduntur et quid in unaquaque epocha verum falsum sit ... demonstrantur. —Ed. altera & auctior & correctior* (Frankfurt, 1620).

Certainly the most noteworthy element of this revised edition (and this remains true for the subsequent editions in 1629, 1650, and 1685, respectively) was the massively expanded *Isagoge* which introduced over forty pages of new detailed astronomical tables and explanations concerning the various cycles of the sun and moon (Metonic, Callipic and Hipparchic cycles), calculi of the solar equinox and solstice, tables of aphelions, apogees, perigees and perihelions, planetary syzygies, lunar and solar eclipses, and an expanded comparative discussions of historical calendar systems. In addition, each year of the Gregorian calendar in the chronology was recalculated to show these various celestial cycles. But aside from the (obviously) later additions of the chronology that extend the timeline beyond Calvisius's death, how much of the expansion of these new editions and the added astronomical material is attributable to Calvisius or his editors I am unable to say. As noted in note 11, Calvisius had claimed to have calculated 150 eclipses by the end of his life. So we must assume that the 150 additional eclipses announced by the editors were his own.

¹⁴ Calvisius's correspondence remains largely unpublished today, although a few selected letters to and from scholars such as Scaliger, Conrad Rittershuis, Hieronymus Treutler, and Kepler were



Example 4: Title page to the 1629 edition of the *Opus Chronologicum*
 (University of Chicago, Special Collections)

Still, as with any academic field crowded with practitioners, Calvisius's work ran into its inevitable critics, including Johannes Kepler. Now Kepler and Calvisius were initially good friends. Kepler had written to Calvisius first in 1607 asking questions on musical matters that he would later address in his monumental *Harmonices mundi* of 1619.¹⁵ And the subsequent flurry of correspondence testifies to a real respect for one another. However, when the subject turned to chronology, it was clear that the two Germans had major differences.¹⁶ The first issue of conflict centered on one of the hoariest problems of Christian chronology: the precise dating of Christ's birth. Since Jerome, Christian writers had sought using what scant historical and Biblical evidence there was to pinpoint this date, and the results had varied widely. Using new tools of astronomical calculation, scholars such as Scaliger and Kepler hoped to solve this conundrum. Specifically, the famous star over Bethlehem that purportedly guided the travels of the three Wise men to Jesus's manger might be explained as a rare planetary conjunction which could be retrospectively calculated. Of course this was not so straightforward, since there were numerous planetary conjunctions that might have represented the star of Bethlehem. Another astronomical clue was the lunar eclipse that Josephus said occurred at the death of Herod. Using his own calculations, Kepler came to the conclusion that the date of Christ's birth must be 5 B.C. Calvisius, however, came to a differing date, which he announced in a treatise of 1613, "De vero nativitatibus Christi" as a rebuttal to Kepler.¹⁷ Calvisius arrived at the date of Jan. 10, 2 B.C. for the exact birth of the Savior. Kepler would respond with his own rejoinder in a pamphlet published the following year and whose title suggests the level of acrimony to which their polemic had reached.¹⁸ The gist of their argument revolved around some rather esoteric calculations of astronomical data that I shall not try to explain here.¹⁹ But

incorporated into the 1685 edition of the *Opus Chronologicum*: "Selectae quaedam clarorum Virorum ad Calvisium Epistolae, una cum responsionibus ad easdem, Chronologiam concernentes, quarum pleraeque hactenus non fuerant editae," in the *Appendix Operis Chronologici Sethi Calvisii* (pp. 6–16).

¹⁵ Of the autograph letters we have from Calvisius to Kepler (there are five extant; none from Kepler to Calvisius survive), musical questions predominate, suggesting that Kepler was seeking advice from the distinguished Kantor. See Michael Dieckreiter, *Der Musiktheoretiker Johannes Kepler* (Bern, 1973), 37. Calvisius's letters may be found in *Johannes Kepler Gesammelte Werk*, vol. 16 (Munich, 1954), ed. Max Caspar.

¹⁶ Calvisius's correspondence with Kepler on chronological questions (different from the letters cited in note 14) was published in an excerpted form in *Joannis Kepleri Mathematici Eclogae Chronicae ex epistolis doctissimorum aliquot Virorum, & suis mutuis* (Frankfurt, 1615); a modern edition is available in the *Johannes Kepler Gesammelte Werke*, vol. 5 "Chronologische Schriften," (Munich, 1953), ed. Franz Hammer, 221–370. Some of these letters are also reprinted in the "Selectae quaedam clarorum Virorum ad Calvisium Epistolae" (see note 14 above). Unfortunately, none of the original letters survive, and Kepler quoted only those parts of Calvisius's epistles to which he wished to respond and refute.

¹⁷ Sethus Calvisius, *De vero nativitatibus Christi anno epistola ad J. Keplerum* (Leipzig, 1613); contained in the *Appendix Operis Chronologici Sethi Calvisii* (see note 13 above).

¹⁸ *Joannis Kepleri Mathematici, ad Epistolam Sethi Calvisii Chronologi Responso, Qua perversi sensus Verborum Evangelistae crimem diluitur, & in authorem retorquetur* (Frankfurt, 1614), in: *Johannes Kepler Gesammelte Werk*, vol. 5, pp. 203–17.

¹⁹ A thorough analysis is provided, however, by Franz Hammer in his Nachbericht to the Kepler volume cited in note 16 especially pp. 414–16. One thing that is clear throughout this controversy,

suffice it to say this exchange soured further whatever goodwill had remained between the two erstwhile friends.

I should like to mention one other publication of Calvisius related to his work on historical dating, although I have no space to discuss it in any detail, and that is his proposal for calendar reform published in 1612, the *Elenchus calendarri Gregoriani*.²⁰ Needless to say, any chronology requires a consistent calendar against which to plot anything. Yet over history and across cultures, there have been a bewildering variety of confusing dating systems based on both solar and lunar cycles. Even the famed Gregorian reform of 1582, which was designed to remedy the growing discrepancies of the Julian calendar, entailed compromises which generated heated controversy throughout Europe, especially in Protestant lands. Devising a calendar that would accommodate the irregular cycles of solar and lunar orbits within coherent and practical divisions proved to be a cottage industry among intellectuals of the 16th and 17th centuries, one to which Calvisius joined. (Perhaps he imagined this as a problem not unlike musical temperament in which musicians attempt to accommodate as many pure consonances as possible within a rationalized, 12-note division of the octave!)

III

With all his writings on chronology, astronomy, and calendar reform, and correspondence with the likes of Scaliger and Kepler, we might momentarily forget that Calvisius's main professional activities concerned music and his duties as Cantor at the Thomas School in Leipzig. It is thus appropriate to ask now what the relationship might have been between Calvisius the musician and Calvisius the chronologist. Was there some deeper affinity between these two vocations that complemented one another, or was this the case simply of an eclectic polymath able to carry on several intellectual disciplines at once?

My view is that there is indeed a real connection between these two halves of Calvisius, and I will shortly discuss a work of his in which these two sides come together in a particularly telling way. But first let me sketch out a more general context by which music and chronology can be seen as complementary endeavors.

To begin with, chronology, in its most basic sense, articulates a kind of temporal harmony that any musician the least versed in speculative music theory would recognize as a part of *musica mundana*. Boethius had taught—drawing from Plato—that the numerical harmony with which God created the universe exists not only in space but over time. Hence, the cycles of astral orbs as well as the seasons on Earth represented a kind of *harmonia temporis*. (Kepler referred to this as the “proportiones harmonicae in motibus coelestibus.”)²¹ The Daily solar

however, is that Calvisius remained vigorously interested in chronological questions until the end of his life, and he continued to make important—if clearly not always accepted—research.

²⁰ *Elenchus Calendarri Gregoriani, in quo errores, qui passim in anni quantitate et Epactis committuntur, manifeste demonstrantur et duplex Calendarri melioris et expeditioris formula proponitur* (Frankfurt 1612). For one of the few secondary discussions of Calvisius's proposal that I could find, see Ferdinand Kaltenbrunner, *Die Polemik über die Gregoriansche Kalenderreform* (Wien, 1877), 83–84.

²¹ Dickreiter, *Der Musiktheoretiker Johannes Kepler*, p. 57.

orbit around the Earth, the rhythms of the planets, moon, comets and stars coursing in graceful arcs above our sky, the regular cycles of the seasons, the rhythms of human ontogeny, all of these suggest that ordered harmony in nature exists as much over time as it does in space, much of it expressible by numbers in explicitly Pythagorean terms. The Roman poet Censorinus, for instance, saw musical order in the gestation of the human embryo. During the first six days after inception, he tells us, the embryo is in a milky humour, from which it emerges into a bloody humour for 8 days, thus approaching the sesiquialtera ratio of the diatessaron; it then forms into flesh over 9 more days, and finally full human form in 12 more days, creating ratios of the diapente and diapason, respectively. These first 35 days are further multiplied by the magic number 6 to create the full span of pregnancy, 210 days.²²

In addition to the temporal regularity of astral bodies coursing through the skies or in the embryos of human gestation, why would not the records of human history likewise be regulated by the same temporal harmony? That is to say, should not the temporal unfolding of world history over some six thousand years since creation be seen as one piece of the *musica mundana* by which God ordained numerical order in creation? Thus Jewish cabalists and Christian mystics saw numerical patterns everywhere in time. As noted by Anthony Grafton, history was full of numerical order that simply could not have been merely serendipitous:

the four monarchies and seventy weeks of Daniel, the 1,260 years of Revelation, the six days of a thousand years that made human history correspond to the six days of Creation, the twelve hours of five hundred years that made it correspond to the twelve hours of Christ's suffering on the cross, the three ages of the Talmudic prophecy of Elias, and the fifty-year Jubilees of the Chronicles of Eusebius and Jerome.... the identical duration of Rome and Babylon—1,164 years—as proof that God had intended them to be seen as parallel empires.²³

If many of these historical patterns were not explicitly Pythagorean in proportion, they still suggested a preordained order to world history that could only be discerned through the logic of number and proportion. How else is one to explain the 582 year divisions separating the Flood from the death of Eber, the birth of Eber from the death of Jacob, and the death of Jacob from the fall of Troy, as one chronologist named Abraham Bucholzer pointed out?²⁴ Or what of the Catholic Goropius Becanus, who noted that Zarlino's scenario of the number six corresponds not only to abstract musical ratios, but to temporal patterns: Christ died on the sixth day; time consists of six ages, and most astoundingly, the difference between the Hebrew and Septuagint computations of the period between the Creation and the Flood is 1,236 years ($1 \times 2 \times 3 = 6$).²⁵ On the other hand, the 16th-century French philosopher Jean Bodin discovered that the rise and fall of states seemed to come in cycles of 496 years, which was derived by 7 times 70 years plus the addition of the perfect number 6.²⁶

²² Censorinus, "De die natali," 11.1–8. See also Franchino Gaffurio, *Theorica musica* (Milan, 1492), Book 1, ch. 3.

²³ Grafton, *Joseph Scaliger*, vol. 2, p. 347.

²⁴ *Ibid.*, p. 348.

²⁵ *Ibid.*, p. 349.

²⁶ Jean Bodin, *Methodus ad facilem historiarum cognitionem* (Amsterdam, 1650).

Many Christian mystics saw patterns in history that could be used for prophetic purposes, most importantly, of course, to forecast the second coming of Christ and the ensuing final judgement of the Apocalypse. The Bible seemed full of tantalizing numerical clues that might be decoded to determine the date of God's final judgment.²⁷ (And any of us familiar with some of the more fringe sects of fundamentalist Christianity from street-corner preachers, cable TV and the internet will realize that this apocalyptic tradition is by no means dormant today.) Of course the line separating proper Biblical eschatology and occult astrology becomes a thin one when engaging in numerical speculation and forecasting, so it is not surprising that the church took a dim view of those who exercised such interests. Still, when history was viewed as a vast temporal gamut upon which human and divine events could be inscribed, it was almost irresistible that there would be those who would analyze such events to see if deeper patterns might be deduced from which future events could be forecast.

Calvisius, being of more sober Lutheran stock, was skeptical of such predictions, and as far as we know, never indulged in numerical speculation in his *Chronology*. (This parallels, incidentally, his music theory, in which he was likewise dismissive of any orthodox Pythagorean endorsement of specific whole-ratios in music simply on the basis of their numerical simplicity).²⁸

But if Calvisius seemed to be a skeptic in regard to numerical patterns in history, he still remained convinced that the accurate ordering of prominent historical events in a single over arching chronology remained a legitimate and noble task. Like plotting intervals on a monochord, the dating of events on the great gamut of human history required patience, knowledge and discipline.²⁹ And music, as Calvisius saw it, was to be a vital part of this history.

IV

It is here, then, that the real connection between Calvisius the musician and Calvisius the chronologist can be seen. For he believed that music, as all other disciplines, also had its own history—both sacred and secular—and it was incumbent upon him to record its history, its

²⁷ An excellent history of apocalyptic prophecy in the time period of Calvisius is Robin Bruce Barnes, *Prophecy and Gnosis: Apocalypticism in the Wake of the Lutheran Reformation* (Stanford 1988).

²⁸ Although this is not to say that Calvisius was completely impervious to numerological coincidences. For example, it surely must have been of some significance to Calvisius that his *Exercitatio* appeared precisely at the turn of the new century (full citation in note 30 below). As Barnes has pointed out, 1600 was a year that had significant prophetic import for many Protestants in the 16th century. (In Revelations 14:20, there is a somewhat obscure reference to 1600 that some Biblical scholars read as a sign for end times; see Barnes, *Prophecy and Gnosis*, pp. 131–35).

²⁹ The relation between musical calculations and calendrical calculations actually has an ancient history, even if it was one of which Calvisius was unaware. In the Middle Ages, churchmen were taught to use one's left hand in order to enumerate (and memorize) the lunar cycle by which the 19 possible dates of the Paschal term (the date of the full moon after the vernal equinox that determines the date of Easter) could be calculated. This "calculus" was the same mnemonic which musicians would adopt, of course, in order to navigate the Guidonian musical gamut. See Karol Berger, "The Hand and the Art of Memory," *Musica disciplina* 35 (1981), p. 111.

beginnings and development. This was the impetus behind Calvisius's study of music history, the *Exercitatio duae de Initio et Progressu Musices* published in 1600.³⁰

The *Exercitatio* is not simply a *laudes musici* of fables and myths concerning the origins of music and its affective powers, however, as it was for most earlier writers from Boethius and Cassiodorus to Gaffori, Glarean, and Zarlino.³¹ For the chronologist Calvisius, music history was to be an *ordered* history, one that should document and date its earliest inventors recorded in the Bible and among the Greeks, as well as description of major developments and practitioners leading up to his own day.³² Here for the first time, both pagan and sacred stories of music are coordinated (if not fully reconciled). In short, Calvisius uses his knowledge of scientific chronology to write what is arguably the very first empirical "history" of music. Note in the following passage how Calvisius describes Pythagoras's musical discoveries by situating him within both pagan and biblical history.

Meanwhile, Pythagoras, who flourished in the age of King Cambyses of Persia, 70 years after the Babylonian captivity, while Superbus the last of the Tarquinian kings managed affairs among the Romans, more than 600 years after the capture of Troy, 500 years before the birth of Christ, perceived that the consonant musical intervals are comprised of certain proportions, and he wished to subject them not only to hearing but to settle them according to reason and by the certitude of visual demonstration.³³

Throughout the *Exercitatio*, Calvisius uses his competence in calendrical calculation to date empirically (usually for the first time) key events and figures in music history right up to his own day. We learn that Aristoxenus, the guardian of sensory judgement of music, was born two hundred years after Pythagoras, or about 330 years before the birth of Christ

³⁰ Sethus Calvisius, *Exercitatio altera de initio et progressu musices, et aliis quibusdam ad eam rem spectantibus* [Teil II der *Exercitationes musicae duae*], Leipzig 1600. As can be seen, the *Exercitatio* appeared five years before the publication of the *Chronologia*. But we must keep in mind that Calvisius was already well advanced in his research into chronology, which he had claimed commenced some 14 years before its publication (*Apologia*, p. 6). Thus we can presume that the *Exercitatio* reflects many of the concerns for precise historical dating that will be seen in the *Chronologia*.

³¹ See the article by Andreas Meyer, "Von Erfindern, Jahreszahlen und letzten Dingen: Calvisius als Historiker der Musik" in *Tempus Musicae-Tempus Mundi: Untersuchungen zu Seth Calvisius*, ed. Gesine Schröder (Hildesheim, 2008), 153–71.

³² Also critical to this project was an entirely new sense of historical time that emerged in the 16th century, a sense in which events were not so much "figurally" (or "representationally") related, but "causally" related; history had a definite, continuous, and measurable temporal trajectory upon which all events could be inscribed leading to the present. (For a helpful discussion of this complex issue, see Peter Burke, *The Renaissance Sense of the Past* [New York, 1969].) For Calvisius, informed as he was by such a strong Reformation perspective, there was also an element of apocalypticism in his historiography that is also discussed by Andreas Meyer (see the citation in footnote 31).

³³ "Donec Pythagoras, qui Cambysis regis Persarum seculo floruit, soluta post septuaginta annos captivitate Babylonica, cum ultimus apud Romanos rex Tarquinius superbus rerum potiretur, ultra sexcentos annos post captam Trojam, quingentis annis ante Christum natum, Musica intervalla consona certis proportionibus contineri deprehenderet, eaque non auditui tantum subjacere vellet, sed ratione ac certissima demonstratione ob oculos poneret" (p. 86).

(p. 90), while the mathematician and astronomer Ptolemy was born about 130 years after the birth of Christ, in the reign of Emperor Antoninus Pius (p. 92). It seems that only by affixing something within an overarching chronology integrated with Biblical and civil history is it given meaning and validation.³⁴

Using his growing chronological prowess, Calvisius attempts to resolve some of the hoariest legends and debates of musical mythology through sober, scientific methodology. Perhaps the most fundamental of such debates concerned who was the first "inventor" of music: the biblical Jubal described in Genesis (4:21) as the "Father of those who play upon the harp and the organ," or the Greek Pythagoras.³⁵ Through a simple calculation of biblical history, it becomes clear that Jubal had to come long before Pythagoras, thus vindicating the priority of Hebrew musical practice over the Greeks.

Other obscure legends in the early history of music were likewise resolved by Calvisius by using tools of chronology. Orpheus's legendary prowess as a musician, for example, was shown to be of the relatively recent past, as we see from the following rather convoluted chronology given by Calvisius:

According to Joseph Scalliger, Troy was captured 2769 years after creation, ten years after the victory of Jephtha over the Ammonites, 123 years before David succeeded the throne of Saul, and as Proteus ruled in Egypt. But 28 years before the capture of Troy, King Latinus to whom Aeneas came to Italy in supplication, had founded his reign. In the same year, Hercules, driven by unendurable sadness, threw himself into the fire and died having scarcely reached 52 years of age, as is testified by the ancient historian Manetho. Hercules was thus born 70 years before the capture of Troy. And in his youth, his companion was Orpheus, whom Linus mocked for his uncultivated voice and was killed [by Hercules].³⁶

Calvisius's conclusion is categorical:

From all this it is clear that, even if Linus was killed by Hercules when he was 60 years old, his father, Apollo and the other inventors and practitioners of music did not precede the destruction of Troy by one-hundred years; rather, they lived at the same time as the Israelite judge Gideon. And

³⁴ The number of dates that Calvisius brings into his *Exercitatio* is truly unprecedented. James McKinnon has noted, for example, that it was only with Hermann Finck's *Practica musica* of 1556 that we encounter for the first time a specific, single date within the text of a musical publication (that being incidentally, 1480—the time in which composers first began writing music that Finck believed to be worthy of our notice). James McKinnon, "Jubal vel Pythagorus, Quis sit inventor musicae?" *The Musical Quarterly* 64/1 (January, 1978), p. 17.

³⁵ A discussion covered more fully in McKinnon, "Jubal vel Pythagorus," pp. 1–28.

³⁶ "Troja capta est, secundum Iosephum Scaligerum, anno à condito Mundo 2769, decem annis post victoriam Iephtae de Ammonitis. Centum viginti tribus annis, antequam David Sauli in regno succederet, regnante Proteo in Aegypto. Anno autem vigesimo octavo ante captam Trojam, Latinus rex, ad quem Aeneas supplex in Italiam venit, fundamenta regni sui iecit. Eodem anno Hercules ex impatientia doloris, se in ignem coniecit, atque ita fato functus est, cum vixisset annos quinquaginta duos, ut vetustissimus Historicus Manetho testatur. Natus est igitur Hercules septuagesimo ante captam Troiam anno. Et in juventute condiscipulus fuit Orphei, praeceptoremque suum Linum, cum ab ipso rigidius increparetur, quod rustice caneret, interfecit" (pp. 81–82).

so music among the Greeks was not as old as has been maintained by certain authors, and we must concede the much greater antiquity of Hebrew music which was celebrated by the Israelites and their Patriarchs immediately after the migration from Egypt.³⁷

We could mine the *Exertatio* for further examples of musical chronology—when did Mercury first invent the lyre with four strings? When did Terpander add additional strings to make the 7- and 8-note lyre? When did Olympus add the enharmonic genre and Timotheus the chromatic? All of these many legends of ancient music could now be subject to the cold, calculating light of chronological inquiry.

The *Exertatio* does not concern itself solely with ancient history, however. As his narrative proceeds, Calvisius moves steadily into the Christian era, although his “history,” such as it is, becomes understandably spotty for a work of only 86 pages. The development of polyphony from the monophonic repertoire of chant is his primary concern (what he calls figural music). But as we might expect, his knowledge of this development is fragmented and filled with misconceptions. For instance, he recognizes organum as an important initial step in the development of multi-voiced composition, but he becomes completely lost in presuming that organum practice was related to performance on the hydraulic organ—a misstep made by Zarlino as well.

The *Exercitatio* is noteworthy, however, for singling out a number of historical music theorists for attention. Two writers in particular are cited by Calvisius for their accomplishments: St. John of Damascus and Guido of Arezzo. John of Damascus, the 8th-century father of the Eastern Church, was heavily involved in chant reform and codification for the Eastern rite, and credited by Zarlino as the inventor of the 8-mode system of Byzantine chant, the *Octoechos*. Calvisius credits him—erroneously needless to say—with the development of a neumatic notation that could account for semitones and other reforms.³⁸ Guido of Arezzo, who receives probably the most space in the *Exercitatio*, is praised for his many theoretical accomplishments, including the extension of the musical gamut, the development of staff notation, and his system of solfege syllables.

Naturally, Calvisius is careful to situate both theorists chronologically by affixing their birth dates and the dates of their major writings. And again, he correlates these—as he did with Biblical events—with civil history. Thus we learn that John of Damascus worked during the reign of Peppin the Younger and Charlemagne in the 9th century, while Guido was active during the Salian dynasty of Holy Roman Emperors, Conrad II and Henry III in the 11th

³⁷ “Ex quibus omnibus apparet: Etiansi Linus fortassis sexagesimo aetatis anno ab Hercule interfectus fuisset, Patrem tamen ipsius Apollinem et alios Musicae inventores et cultores centum annis eversionem Trojae non antecessisse, sed Gideonis iudicis Israelitici saeculo vix floruisse. Atque ita Musica apud Graecos non ita vetusta est, ut quidem autores astruere conati sunt, et antiquitate sua Musicae Iudaicae, ut quae et apud Patriarchas, et statim post migratam Aegyptum, apud Israelitas celeberrima fuit, longè cedit” (pp. 82–83).

³⁸ Calvisius’s source for information on John of Damascus’s “musical reforms” was likely Zarlino’s *Le Istituzioni Harmoniche* (1558), Book 4, ch. 8.

century. Once again, musical history seems to be given a kind of validation by being linked within a broader universal history.³⁹

V

None of us today would mistake the *Exercitatio* as a viable history of music. It is obviously hobbled by gross misunderstandings and gaping holes. But at the same time, it is a progressive history of music in that it seeks, however tentatively and ineptly, to offer a chronological narrative of music's evolution from its origins to our own day (which Calvisius adds has reached a state of perfection such that any further development is inconceivable). More importantly, he understands music as a part of universal history, one that is integrated within biblical and civil history.

Calvisius died on November 24, 1615, still actively corresponding with intellectuals across Europe on chronological questions, and still active as a composer and cantor at St. Thomas. During his funeral held on November 27 the Thomas Choir sang a motet of Calvisius based on a text from Psalm 90 whose resonance to his work as a chronologist would not have been lost upon any one in the congregation: "Unser Leben währet Siebzig Jahr; Und wenn es hoch kommt, so sind es achtzig Jahr." He may not have lived out the full span of 70 years promised by God to his faithful flock, but in his 60 mortal years on this Earth, Seth Calvisius did accomplish much about which he could be pleased and proud. For in addition to his profound musical legacy, he did something few before him would have dared: he tried to take the measure of time itself, to plot the history of mankind upon God's temporal gamut of creation.

³⁹ I should note a curious paradox that most of the musical dates given in the *Exercitatio* do not make their way into the *Chronologia* five years later. Only a few of the musicians and theorists found in the early work can be found in the later Universal chronology. For example, the only mention of Guido in the *Chronologia* concerns the writing of his "Musica" around 1028 (a.m. 4977). There is no mention of Aristoxenus, Orpheus, or Timotheus; Ptolemy, Boethius, and John of Damascus are mentioned, but not for any of their musical contributions. And in the modern era, the only musicians I was able to find mentioned in the *Chronologia* aside from Guido are Hermannus Contractus (under the year 1054) and Heinrich Glarean (whose death is noted in 1563). Nor do any of the later editions rectify this situation.

I can offer no sure explanation as to the lack of musical datings in the *Chronologia*. Perhaps Calvisius thought in a grand universal history, musical issues were not of comparable importance or interest to readers. Perhaps, too, he felt he lacked any secure evidence for the dates he proposed in the *Exercitatio*. Whatever the case, it does indeed seem odd that a chronology compiled by a scholar with such demonstrated historical knowledge of music concerns itself so little with this topic.