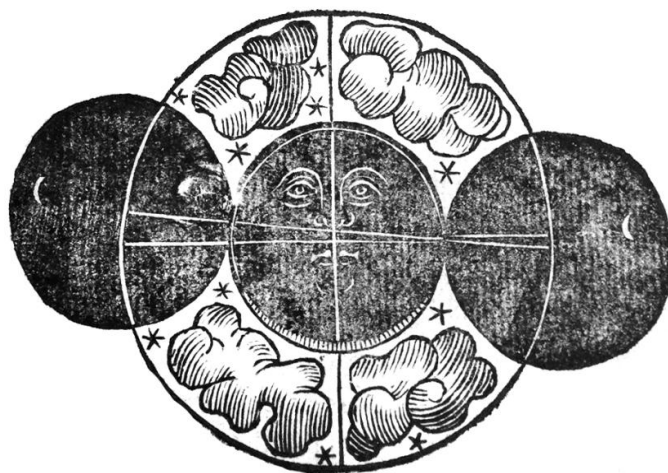


Black Monday

Eclipses in the Folger Collections



Part I: Science?

Bernat de Granollachs (1421 - circa 1487)

Lunarium in quo reperiuntur coniunctiones [et] oppositiones lune, [et] eclipses solis...

[Rome]: [Johann Besicken and Martinus de Amsterdam], [ca. 1500]

Call Number: INC G311.5

This small guide provides tables showing the dates of the full moon ("con.") and new moon ("oppo."), beginning in 1500 and ending in 1550. A highly popular book, many reprints of Granollachs's work were made, clearly even after his death. Each table in the guide includes notes on the various lunar and solar eclipses that could be expected that year, and when, as well as small woodcuts of the expected eclipses themselves. Scholars posit that, since there is no evidence the (minorly) noble Granollachs was an astronomer or made any astronomical calculations, he based his guide on the tables of a fourteenth-century Jewish astronomer, Jacob ben David Bonjorn. Bonjorn's tables were widely available in fifteenth-century Barcelona, and appear to match up to Granollachs's calculations in an eerily similar way.

Chabáas, J. and Roca, A. (1998). *Early Printing of Astronomy: The Lunari of Bernat de Granollachs*. *Centaurus*, 40: 124–134. doi:10.1111/j.1600-0498.1998.tb00421.x

Joannes de Sacro Bosco (circa 1230)

Tractatus de Sphaera

Venice: Erhardt Ratdolt, 1482

Call Number: INC J364 copy 3

One of the most influential pre-Copernican texts on astronomy, Sacrobosco's *Treatise* provides a basic introduction to the subject, drawn primarily from Ptolemy and Arabic sources. Sacrobosco discusses the solar eclipse near the end of the his fourth and final chapter--describing when and how a solar eclipse can be expected to occur, as well as providing a visual aid. First printed in 1472, this edition is the earliest held by the Folger, and provides an early example of color printing from woodblocks.

Joannes de Sacro Bosco (circa 1230)

Sphaera cum commentis in hoc volumine contentis, videlicet.

[Venice] : Impensa heredum quondam Domini Octauiani Scoti Modoetiensis,... 1518

Call Number: Folio QB41 .S3 1518 Cage

This 1518 edition of Sacrobosco's text is bound with a series of commentaries from a variety of authors, including Robert Grosseteste, Francesco Capuano, and Jacques Lefèvre d'Étaples. The text is illustrated with new and charming woodcuts, including the two shown here which depict lunar and solar eclipses. Another aspect of Sacrobosco's commentary on and description of solar eclipses includes his discussion of an eclipse that was said to occur during the passion of Christ, which he calls "miraculous and contrary to nature, since a solar eclipse ought to occur at the new moon or thereabouts."

Folger's copy includes manuscript annotations and notes throughout in a contemporary hand.

Thomas Streete (1621-1689)

Astronomia Carolina: A new theorie of the coelestial motions.

London: Lodowick Lloyd, 1661

Call Number: 266559

Streete was an English astronomer, best known for this volume on theories of celestial motion. *Astronomia Carolina* was widely read, and has been noted as one of the chief influences for Newton's *Principia Mathematica*. D.T. Whiteside, writing of Streete's influence on Newton, notes that he "was a competent practising amateur astronomer...a careful observer of celestial phenomena with a good knowledge of current computational techniques, but not a man strongly endowed with mathematical ability." Newton copied several of the lunar and planetary tables in *Astronomia* into his notebooks, likely from this 1661 edition. This opening shows Streete's explanation of how "to calculate an eclipse of the sun." John Aubrey writes in his *Brief Lives* that Streete "printed that excellent piece of *Astronomia Carolina*, which he dedicated to King Charles II, and also presented it well bound to Prince Rupert and the Duke of Monmouth, but never had a farthing of any of them."

Aubrey, John. *Brief Lives*. Oxford: Clarendon Press, 1898.

Whiteside, D.T. *Before the Principia: the maturing of Newton's thoughts on dynamical astronomy, 1664-1684*. *Journal of the History of Astronomy*: 1 (1970), 5–17.

Giuseppe Biancani (1566-1624)

Sphaera Mundi, seu cosmographia demonstrativa, ac facili methodo tradita:...

Modena: Andreas and Hieronymus Cassiani, 1653

Call Number: GA7 .B5 1653 Cage Fo.

Biancani, a Jesuit mathematician and astronomer, completed this work on astronomy in approximately 1615, publishing the first edition in 1620 due to changes required by the Catholic Church. The work presents and discusses details of the works of many other eminent scientists and mathematicians of the age, including Copernicus, Brahe, Kepler, and Galileo, with whom Biancani enjoyed professional respect and a close friendship. Galileo's support of heliocentricity was a sensitive topic at this time, and Biancani was either forced or felt it was necessary to publicly repudiate it. He does so in *Sphaera Mundi*, stating that while the idea is "supported by better proofs and arguments," it is prohibited.

This opening shows his explanation of how a solar eclipse occurs, how it is most easily observed, and discusses (as did Sacrobosco) the significance of the supposedly "unnatural" eclipse that occurred during the Passion, as well as providing two useful woodcuts to illustrate his thoughts.

Philip Melanchthon (1497-1650) and **Joachim Camerarius** (1500-1574)

Eclipsium Solis et Lunae annis iam aliquot uisarum descriptiones...

Basel: Robert Winter, 1540

Call Number: 226- 512q

Philip Melanchthon, the German protestant reformer and humanist, was also an avid student of astrology. He firmly believed, as did many of his contemporaries, in the influence that heavenly bodies could exert on human life and experiences. Eclipses appeared to be of particular importance to him, usually indicating (as they did for many) great tragedy--he went so far as to dismiss his classes on days when an eclipse was due to occur. The poems shown here were collected by the Italian astrologer Luca Gaurico, who printed them with poems of the fifteenth-century Italian astrologer-poet Lorenzo Bonincontri.

Part II: Omens

Conrad Lycosthenes (1518-1561)

Prodigiorum ac ostentorum chronicon,...

Basel: Henricus Petrus, 1557.

Call Number: GR825 .L8 1557 Cage Fo.

This hefty volume is, as one scholar notes, “visually and textually dense.” Lycosthenes, a German polymath, was inspired by earlier works seeking to document portents and omens throughout history. His *Chronicle of Prodigies and Signs* documents monstrous births, celestial events, and other “wondrous” occurrences from the old and new Testament up through the present day, clearly meant to lay a trail to the current time as the last days before the second coming. The visual aspects of this volume were clearly more important in their density than in their uniqueness, and images are reused multiple times throughout the work.

Here you see the years 81-107, during which he claims there was a solar eclipse (showed twice, apparently for emphasis), the eruption of Mount Vesuvius (erroneous), Apollonius of Tyana’s salutation by an elm tree, and the destruction of four cities in Asia by a terrible earthquake.

Christopher Heydon (1561-1623)

A recitall, of the celestiall apparitions,...[manuscript]

ca. 1620

Call Number: V.b.332

Sir Christopher Heydon, a contemporary of Robert Devereux, was a strong proponent of astrology. His book *A Defense of Judiciall Astrology* (1603), published in response to a pamphlet urging Parliament to ban speculative astrological predictions, defended the subject as an exact science. He made many astrological predictions himself, many of which are reflected here. He focuses chiefly on what the comets seen in different years at the beginning of the seventeenth century might mean, but does touch on “the great & ominous Eclipse of the Sunne” in 1605. Most of his predictions focused on the radical and imminent supremacy of a new Protestant world order.

"Mirk" or "Black" Monday: the Total Solar Eclipse of 1652

In 1652, a total solar eclipse was visible over Great Britain, with most of lowland Scotland and northern England falling in the path of totality. There were a variety of reactions.

William Lilly (1602-1681)

Annus tenebrosus, or The dark year. : Or astrological iudgements upon two lunar eclipses, and one admirable eclips of the sun, all visible in England, 1652....

London: Printed for the Company of Stationers, and H. Blunden at the Castle in Corn-hill, 1652.

Call Number: 144- 554q

William Lilly is perhaps one of the best-known “judicial” astrologers of his time. He was, as a biographer notes, “virtually a genius at something—judicial astrology—which modern mainstream opinion fails to recognize as even something that it is possible to do, let alone do well or badly.” Lilly published astrological predictions furiously throughout his life, including the well-known series of almanacs *Merlini Anglici Ephemeris* from 1647 until his death.

Annus tenebrosus, like many of Lilly’s works, is full of bold prophecies for the remainder of 1652. Perhaps unsurprisingly, most of these predictions are negative. They include, but are not limited to: disputes over English sea and fishing rights, the expectation of treachery from the Dutch,

"tumults and seditions" within the court of the Ottoman Empire, "poverty and beggary" in Scotland, a threat to the friendship between Russia and Poland, division in Sweden and Denmark, and general excess of "shipwrecks, storms, pyracies, and without the mercy of God, strange murmurings" across the globe. Not even the Pope escapes Lilly's predictions, and is promised "danger either of death, or some private misfortune."

Folger's copy of *Annus tenebrosus* includes manuscript notes and underlining in a contemporary hand.

Nicholas Culpeper (1616-1654)

Catastophe Magnatum: or, The Fall of Monarchie. : A Caveat to Magistrates, Deduced from the Eclipse of the Sunne, March 29. 1652....

London : Printed for T. Vere and Nath: Brooke, in the Old Baily, and at the Angel in Cornhil, 1652.

Call Number: 261279

A contemporary and sometime collaborator of William Lilly, Nicholas Culpeper was an herbalist and physician who moonlighted in judicial astrology. While working as an apothecary, he came into conflict with the College of Physicians, and was even accused of witchcraft in 1642 (though acquitted). He also produced almanacs regularly throughout his life.

Like Lilly, Culpeper produced predictions for the eclipse of 1652, but unlike Lilly, he includes (or at least attempts to include) some scientific information in *Catastophe Magnatum* as to what an eclipse is, and how he has calculated the length of the 1652 totality. Although his predictions focus less on the sea, in general he agrees with Lilly: 1652 will be a year of upheaval, of earthquakes, pestilence, murrain, "strange massacres, desperate tumults, fire and sword," invasion by the Turks, and apparently the downfall of most nations in Europe.

Author Unknown

Black Munday turn'd white, or, The astrologers knavery epitomized : being an answer to the great prognosticks and gross predicitions of Mr. Lillie, Mr. Culpeper, and the rest of the society of astrologers concerning the eclipse of the sun on Munday last ...

London : Printed for C. Whiting, 1652.

Call Number: 206- 424q

Not everyone was impressed by the judicial astrologers, as evidenced by this anonymous pamphlet, produced approximately a week or so after the eclipse. The writer attacks the "knavery" of various astrologers, and is firmly convinced that nothing but happy days are ahead for England. They conclude by describing the lengths to which Lilly et al. got even the appearance of the eclipse wrong:

I shall not need to quote any more of his ridiculous absurdities; but conclude with his gross Predictions concerning the Eclipse on March 29. which (according to his Calculation) should have been the greatest that ever eyes beheld in this latter age. Certainly, this argues a great want of faith, and a spiritual darkness; for although there appeared enough to satisfie rational men that there was an eclipse; yet we may observe, that he made the two great Luminaries, and ordereth their course sitteth in the Circle of the Heavens, and will not give His honour unto any other; but drew back the Clouds like a Curtain, and caused the Sun to shew his pleasant Rays and comfortable Beames during the whole time of the eclipse, to the confutation of the great Astrologers, who by the help of Tycho were able to guess at the time of the eclipse, yet could not tell whether the day would be cleer or cloudy...

Richard Strode (1584-1689) [et al.]

Annotations and notes interleaved with Culpeper's An ephemeris for the year 1652 and in A new-years-gift, 1651 being the yeare of liberty [manuscript], ca. 1652.
ca. 1652-1689?

Call Number: V.a.491 (ms content)

This interleaved and heavily-annotated copy of Culpeper's *Ephemeris for the year 1652* likely belonged to Richard Strode, a Devonshire nobleman. Many of the annotations are copies of documents relating to prisoners kept during the Commonwealth and Protectorate, particularly concerning Strode, including a copy of Strode's petition to Oliver Cromwell for his release from the Chancery Prison, a copy of his petition to the Court of Common Pleas, and notes on the Chancery Court. There is also a significant amount of biblical verses.

The opening featured here, to Culpeper's notes on the solar eclipse, features biblical verses with a distinctly apocalyptic feel. The annotator, Strode or a contemporary, has even copied a verse inside the envelope diagram (showing how the eclipse will fall within the 12 houses of the zodiac). The reference is to 2 Esdras 15:13: "They that till the ground shall mourn: for their seeds shall fail through the blasting and hail, and with a fearful constellation" (King James). Culpeper, in his usual cheerful manner, merely states: "all the Evils the Sword, Sedition, Famine, Pestilence, can do to Europe, may be expected from the effects of this Eclipse."

John Gadbury (1627-1704)

Ephēmeris: or, A diary, astronomical, astrological, meteorological, for the year of our Lord, MDCLXXXIV. It being the bissextile, or leap-year. : With an account of the great solar eclipse,...

London : Printed by J[ohn]. D[arby]. for the Company of Stationers, 1684.

Call Number: 176- 783q

John Gadbury followed in the path of astrologers like Lilly and Culpeper, but judicial astrology was viewed with an increasingly critical eye. Gadbury's astrology became more skeptical, and he branched out into navigation, exploration, and natural philosophy. He developed a rather suspicious reputation, however, and was even accused (though acquitted) of involvement in the Popish Plot. Gadbury, like Lilly and Culpeper, produced a large amount of almanacs.

This copy of his *Diary, astronomical...* on display here discusses a solar eclipse due in 1684, and provides a charming "envelope diagram" with a woodcut of a partially-eclipsed sun at the center. The beginning of this edition also includes a note from the author, discussing the accusations leveled against him regarding the Plot.

John Palmer (1612-1679)

The catholique planisphaer. Which Mr Blagrave calleth the mathematical jewel ; briefly and plainly discribed, in five books.

London : Printed by Joseph Moxon, and sold at his shop on Corn-hill, at the signe of Atlas, 1658.

Call Number: 140- 777q

John Palmer, a rector and later Archdeacon living in Northamptonshire, produced this edited edition of John Blagrave's (1561-1611) *Mathematical Jewel* (originally published in 1585) nearly one hundred years after its first publication. This edition is dedicated to a fellow astronomer and mathematician, John Twysden. The book discusses different ways to use a planisphere (a star chart made up of two rotating discs) to solve various astronomical challenges. Palmer includes a section on topics related to judicial astrology in his book, though not because he thinks it worthwhile in and of itself:

Some learned Artists may perhaps think that these 8. last Chapters pertaining to Astrologie might be spared; and I think so too: but that I foresee they may be of use to such as would examine the errors and fallacies of Astrologians.

The opening shown here is part of a section of Palmer's book called "Catalogue of Eclipses, observed since the year of our Lord 1637." He discusses viewing the "Black" Monday eclipse of 1652, and his account agrees with that of Lilly and Culpeper's anonymous critic above: "and though this Eclipse was so great, yet we could read in the time of the greatest darkness within Dores, notwithstanding that the Window was covered with a Blanket."

Joseph Burroughs (1685-1761)

A sermon occasion'd by the total eclipse of the sun : upon April the 22d, 1715.

London : Printed by J. Darby for A. Bell, J. Harrison, and J. Baker, 1715.

Call Number: 186791

Judicial astrology, and its reading of eclipses as certain signs of doom, seems to have been totally out of fashion by the beginning of the eighteenth century. Joseph Burroughs, an English Baptist minister, gave this rousing sermon against superstitious interpretations of eclipses in particular in 1715. His reasoning is both religious and scientific--on the one hand, he says, we shouldn't buy in to judicial astrology because this is what "heathens" do. On the other hand, he notes, "neither the Sun, nor the Moon, nor any other of the Celestial Bodies, are able to do us any Mischief of themselves...there is no reason to believe that the Ordinary motions of the Heavenly Bodies do really portend any Threatening at all."

However, astrology remains popular today, if not given quite the same weight as it once enjoyed.