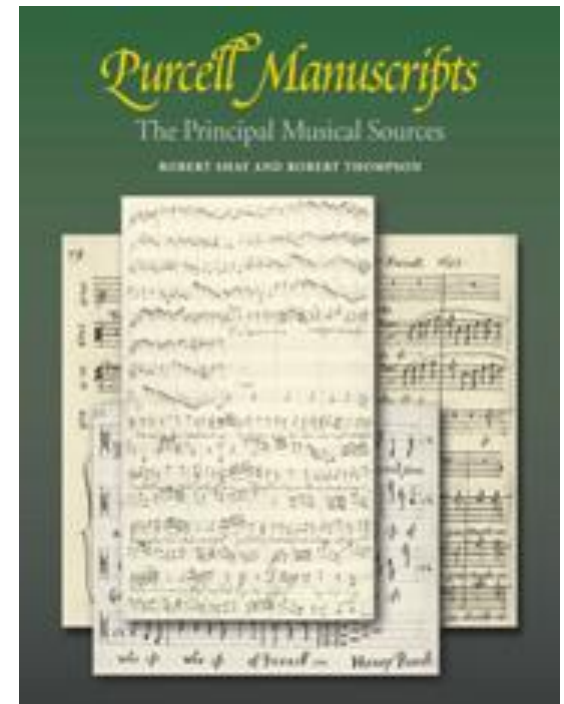


A Big Data History of Music

Stephen Rose, Royal Holloway

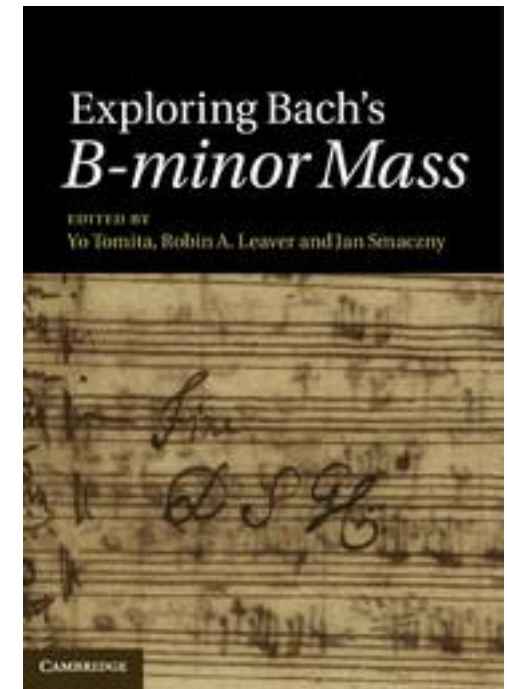
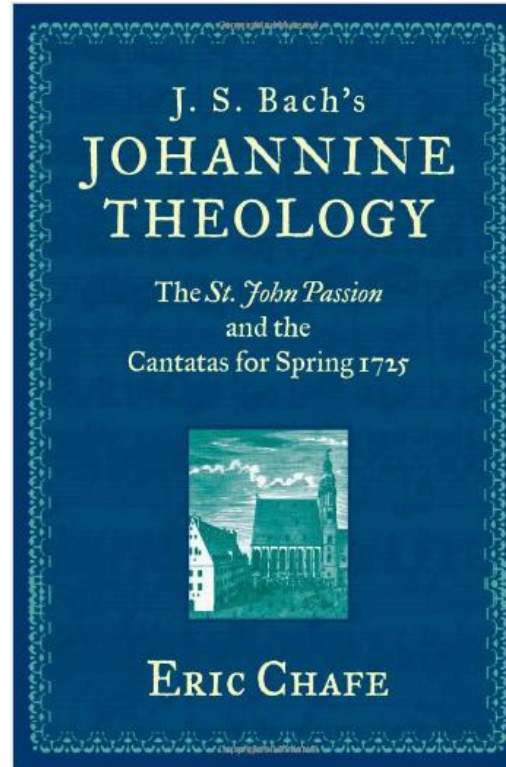
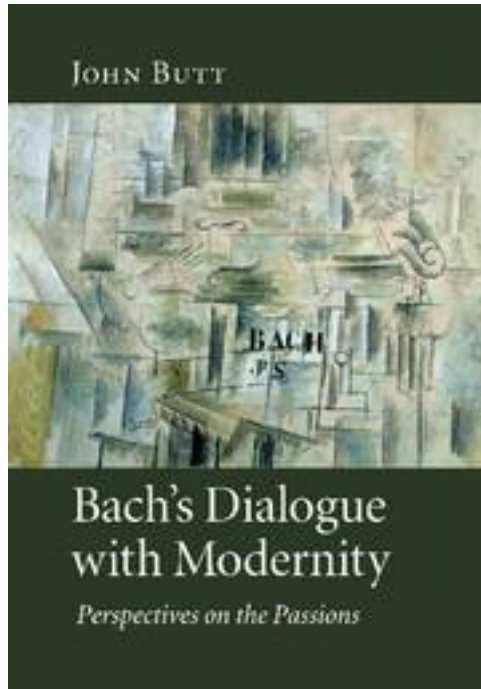


Trends in music history – source studies



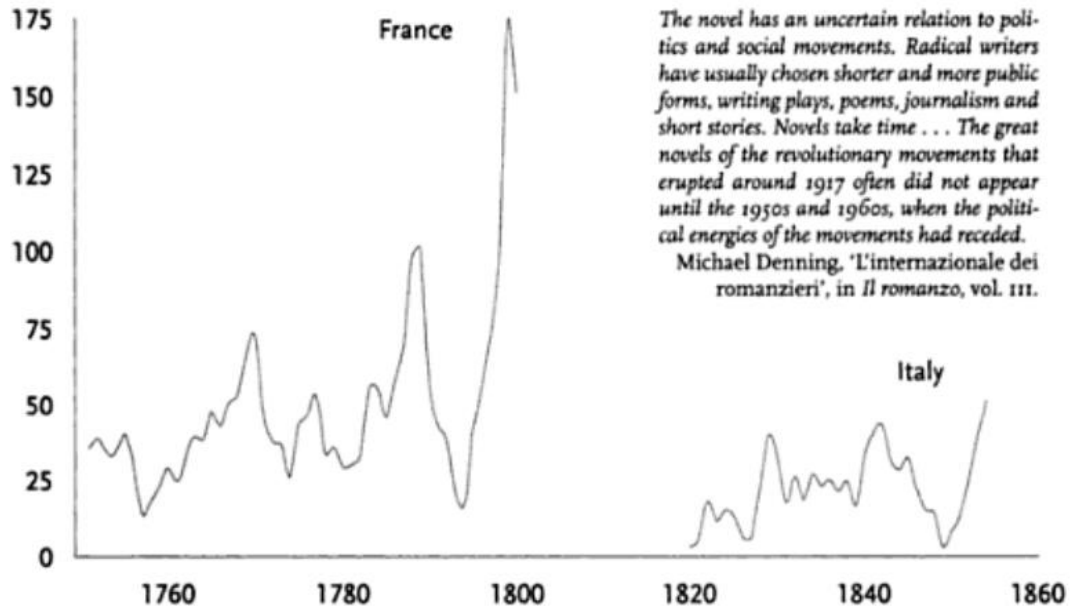


Trends in music history – social / intellectual contexts of ‘work’





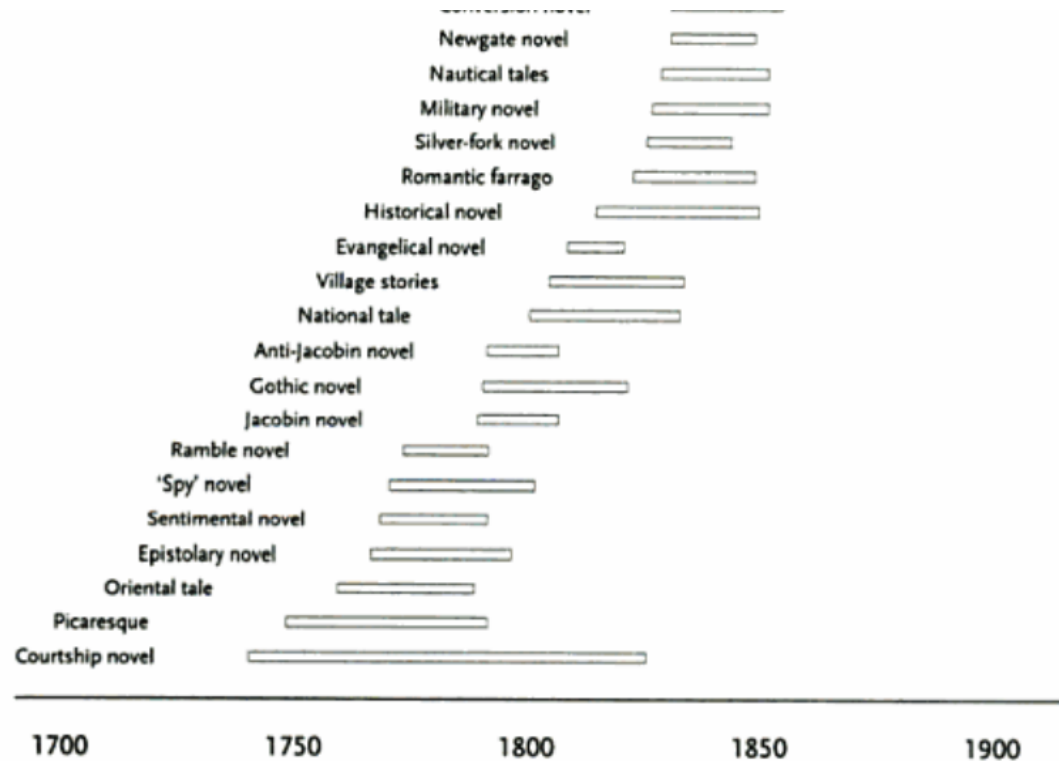
Franco Moretti's 'distant reading'



New novels per year. Sources: For France: Angus Martin, Vivienne G. Mylne and Richard Frautschi, eds, *Bibliographie du genre romanesque français 1751-1800*, Paris 1977. For Milan: Giovanni Ragone, 'Italia 1815-70', in *Il romanzo*, vol. 111, and *Catalogo dei libri italiani dell'Ottocento*, Milano 1991.

Franco Moretti, *Graphs, maps, trees: abstract models for a literary history* (2005), p.11

Charting the 'Great Unread'



Franco Moretti, *Graphs, maps, trees: abstract models for a literary history* (2005), p.19

Big Data in music...

Machine readable scores?

Audio libraries?

Metadata about music publications?

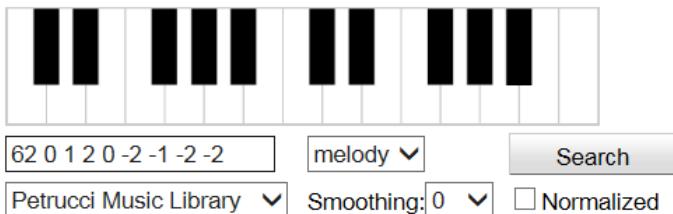
Machine readable scores

e.g. www.peachnote.com

Music Ngram Viewer



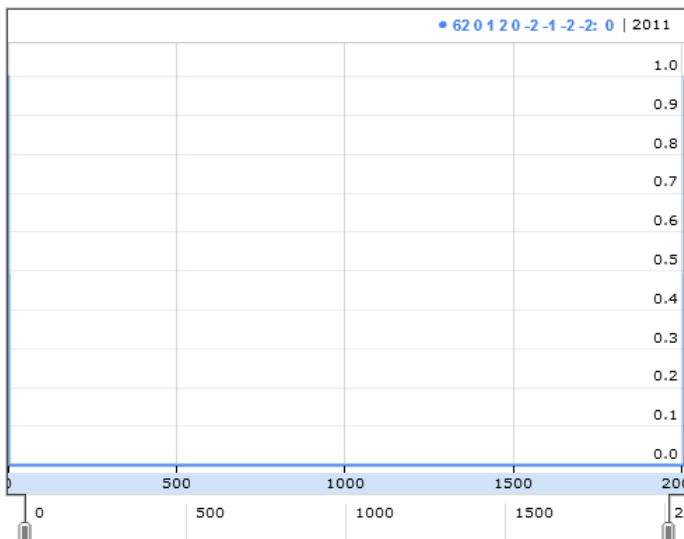
Please enter a melody or a sequence of [chords \(advanced use\)](#)



62 0 1 2 0 -2 -1 -2 -2

melody

Petrucci Music Library Normalized



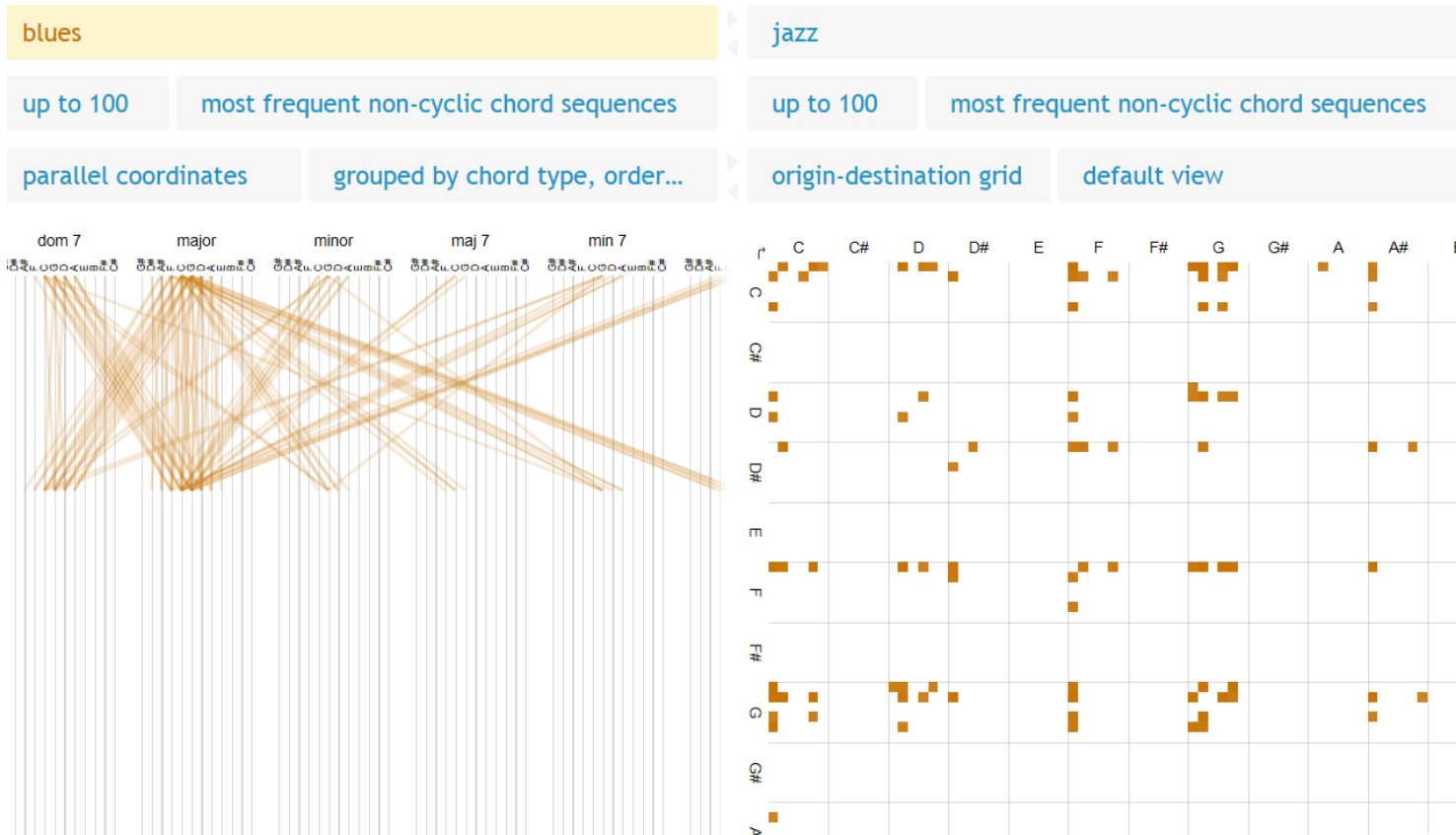
(e.g. Mozart, winds, or quartet)

- Symphony No.9, Op.125 (Beethoven, Ludwig van) [YouTube](#) [\[score\]](#) pages [3,12](#)
[\[score\]](#) pages [14,30](#)
- Beethoven, Ludwig van** (0)
- Solos for Treble Instrument, Especially Soprano Recorder (Kimberling, Clark) [YouTube](#) [\[score\]](#) pages [11,34,107,149](#)
Kimberling, Clark (0) [\[score\]](#) page [100](#)
- Il barbiere di Siviglia (Rossini, Gioacchino) [YouTube](#) [\[score\]](#) page [101](#)
Rossini, Gioacchino (0)
- Scale-Studies for Violin (Hřimalý, Jan) [YouTube](#) [\[score\]](#) pages [8,10,11](#)
Hřimalý, Jan (0)
- 4 Trio Sonatas, WK 98-101 (Abel, Carl Friedrich) [YouTube](#) [\[score\]](#) pages [3,10](#)
Abel, Carl Friedrich (0)
- 3 Trios, Op.11 (Hoffmeister, Franz Anton) [YouTube](#) [\[score\]](#) pages [11,12](#)

Audio Big Data

e.g. Digital Music Lab

chord visualiser



Vision for project

How can the vast amount of bibliographical data held by research libraries be unlocked for music researchers to analyse?

Can this data be interrogated in ways that challenge the traditional narratives of music history?

Aims of project

- To clean and enhance two existing bibliographical datasets
- To pilot big data research techniques on these and five other datasets
- To make the British Library datasets publicly available for download

Project datasets

- RISM A/I (*Répertoire International des Sources Musicales*) - single-composer printed editions issued before 1800), ca. 100K records. *opac.rism.info* since May 2015
- RISM B/I - printed anthologies, 1500-1700, ca. 17K records. *Not yet fully online*
- RISM A/II - music manuscripts, 1600-ca. 1850, opac.rism.info, incorporating the RISM UK catalogue of music manuscripts, ca. 900K records
- British Library catalogue of printed music, explore.bl.uk, ca. 1 million records
- British Library catalogue of manuscript music, searcharchives.bl.uk, ca. 16K records
- Augustus Hughes-Hughes: *Catalogue of Manuscript Music in the British Museum* (London, 1906-9), ca. 35K records. *Not yet online*
- Concert Programmes Database, www.concertprogrammes.org.uk, ca. 6K records

Project datasets

- British Library catalogues of printed music and manuscript music now available as CSV files for download at www.bl.uk/bibliographic/download.html

RISM volumes



RISM online catalogue

Home Organisation International Publications Community



Online Catalogue of Musical Sources

Search ...

News



New publications: The 2014 Annual Report
The annual report for 2014 has been posted to the RISM website. Did you know that thanks to the hard work of our colleagues—in over 35 countries around the world—there are over 880,000 records in the online database? Other highlights from 2014: The CD-ROM data for series A/I (Einzeldrucke vor...
[continue](#)

 [Subscribe](#) to [rism.info](#) with your RSS reader

ABOUT RISM

Learn [more](#) about this international research project.

RISM LIBRARY SIGLA

Sigla for libraries, archives and

100%

Data facets or types

Composers

Musical works

Places

Time

Subjects/genres

Printers/publishers

Data facets captured in music datasets

	Composer	Work title	Country of origin	City of origin	Creation date	Subject/genre	Printer/publisher
A/I	Y	some		Y	some	Y	Y
B/I	Y			Y	Y		Y
CPM	some	some	Y	Y	Y (though many are approx.)	some	some
A/II	Y	Y			Y	Y	N/A
BL MSS	Y	some			Y		N/A
H-H	Y	Y			Y	Y	N/A

Key:

A/I – RISM A/I (single-composer printed editions)

B/I – RISM B/I (printed anthologies)

CPM - British Library catalogue of printed music

A/II – RISM A/II (music manuscripts)

BL MSS – British Library catalogue of manuscripts

H-H – *Catalogue of Manuscript Music in the British Museum*, ed. A. Hughes-Hughes

Transforming the data from MARC21 library format

MARC21 format

FMT	MU
LDR	cm a22001933 4500
001	004763607
008	850515s1783 ne lin
040	a Uk c Uk
1001	a Clementi, Muzio, d 1752-1832.
24010	a Sonatas, m piano, n op.9
24500	a Trois sonates pour le forte piano ou le clavecin / c composées par Muzio Clementi. Oeuvre IX.
260	a À Amsterdam : b [s.n.], c [1783?]
300	a 38p. ; c fol.
336	a notated music 2 rdacontent
337	a unmediated 2 rdamedia
338	a volume 2 rdacarrier
85241	a British Library b MUSIC j h.319.o.(2.)
SYS	004763607

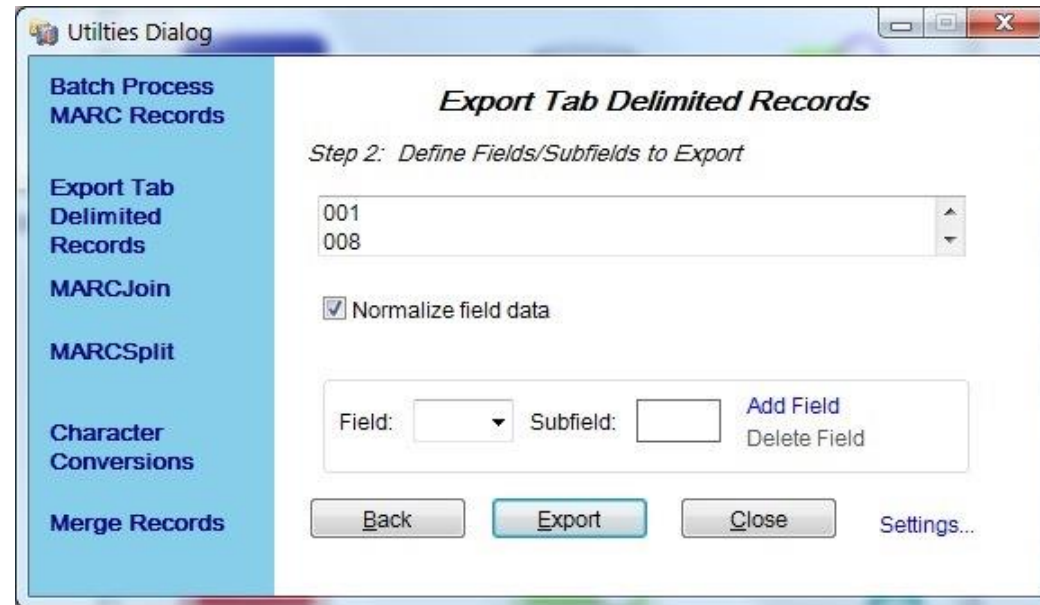
Transforming the data from MARC21 library format

Spreadsheet row

206	Birch, W. H. (William Henry), 1826-1888.				Grand triumphal march [for pianoforte], etc.
207	Birch, W. H. (William Henry), 1826-1888.				W. H. Birch's Vocal Miscellany, a selection of choruses, glees, quartets, trios, etc.
208	Hurlebusch, Conrad Friedrich.				De 150 Psalmen Davids, met de zelve Lofgezangen, gemaakt voor het clavier en orgel, na hunne gegro
209	Hurlebusch, Conrad Friedrich.				De 150 Psalmen Davids, met der zelve Lofgezangen, gemaakt voor het clavier en orgel, na hunne gegro
210					[Sji'r segala Mazmūr-Da-ūd, dan pūdji-an jang lajin, etc. (Ta'limu-'Idini-'Imesēhiji, ija itu, pang' adjaran '
211	Haym, Nicola Francesco, 1678-1729.	Dodeci sonate à trè, cioè due violini,			<Violino primo. - Violino secondo.> [Parts.]
212	Mozart, Wolfgang Amadeus, 1756-1791.	Zauberflöte.			<Zweyter Theil.>
213	Mozart, Wolfgang Amadeus, 1756-1791.	Zauberflöte.			Die Zauberflöte. <Zweyter Theil>.
214	Mozart, Wolfgang Amadeus, 1756-1791.	Zauberflöte.			Ouverture fürs Clavier oder Piano forte.
215	Locatelli, Pietro Antonio, 1695-1764.	Concertos,	op.1.		[XII concerti grossi a quattro, e a cinque ... opera prima ...].
216	Clementi, Muzio, 1752-1832.	Sonatas,	piano,	op.9	Trois sonates pour le forte piano ou le clavecin / composées par Muzio Clementi. Oeuvre IX.
217	Kywtok, B. I. W.				God save the King in VIII easy variations for the piano f composed by B.I.W. Kywtok.
218	Scaccia, Angelo Maria.				Concerti con Violino Obligato, due Violini, Alto Viola e Basso Continuo. Opera Prima. [Parts.]
219	Valentini, Giuseppe.				x concerti a violino primo, secondo e basso concertino, e violini primo e secondo concerto grosso, viole
220	Mossi, Giovanni.				Concerto xiio a Quatro Violini e Violoncello Obligati. [Parts.]
221	Jozzi, Giuseppe, approximately 1710-approximately 1770.				VIII sonate per cembalo, ppera prima / da Giuseppe Jozzi.
222	Simono, D.				Recueil Nouveau d'Airs, Menuets, Contredanses, Gavottes & Gigues, de Differens Autheurs, Italiens, Fr
223	Schmid, J. B.				vi. Sonates de Clavecin, avec Accompagnement ad libitum de deux Violons et Basse Continue, etc. [Par
224	Collasse, Pascal, 1649-1709.	Thetis et Pelée			Les Airs de la Tragedie de Thetis et Pelée.
225	Hol, Rijk, 1825-1904.				Ontwaking. Lied voor eene Zangstem met Klavierbegeleiding. Woorden van J. A. Bakker. Op. 78.
226	Schuurman, F. H.				Aan het Vaderland. Gedicht van L. Uhland, vertaald door B. van Meurs. Lied voor Tenor met Piano. Op. 2
227					De cl Psalmen Des Propheten Davids ... overgeset Door Petrum Dathenum; En ... op eenen Sleutel geste

Transforming the data from MARC21 library format

MARCCedit tool used to transform library catalogue records into TSV files



<http://marccedit.reeset.net/>

Library data diversity: date information

- [WM 1825]
- [ca. 1825]
- [1825?]
- [1825]
- 1825
- [1825-1830]
- [before 1825]
- [after 1825]
- [between 1825 and 1830]

Row Labels	Count of Dates
1825	1
[1825?]	1
[1825]	1
[1825-1830]	1
[after 1825]	1
[before 1825]	1
[between 1825 and 1830]	1
[ca. 1825]	1
[WM 1825]	1
Grand Total	9

Data preparation

Date	Date	Date	Date
[WM 1825]	1825	1820s	19th century
[ca. 1825]	1825	1820s	19th century
[1825?]	1825	1820s	19th century
[1825]	1825	1820s	19th century
1825	1825	1820s	19th century
[1825-1830]		1820s	19th century
[before 1825]			19th century
[after 1825]			19th century
[between 1825 and 1830]		1820s	19th century

Data preparation

Date	Date	Date	Date
[WM 1825]	1825	1820s	19th century
[ca. 1825]	1825	1820s	19th century
[1825?]	1825	1820s	19th century
[1825]	1825	1820s	19th century
1825	1825	1820s	19th century
[1825-1830]		1820s	19th century
[before 1825]			19th century
[after 1825]			19th century
[between 1825 and 1830]		1820s	19th century

Row Labels	Count of Dates
1825	5
Grand Total	5

Row Labels	Count of Dates
1820s	7
Grand Total	7

Row Labels	Count of Dates
19 th century	9
Grand Total	9

Open Refine (<http://openrefine.org/>)



[Home](#)

[Download](#)

[Documentation](#)

[Community](#)

[Post archive](#)

[Mapping OpenRefine
Ecosystem](#)

[2014 survey results](#)

Welcome!

OpenRefine (formerly Google Refine) is a powerful tool for working with messy data: cleaning it; transforming it from one format into another; extending it with web services; and linking it to databases like [Freebase](#).

Please note that since October 2nd, 2012, Google is not actively supporting this project, which has now been rebranded to OpenRefine. Project development, documentation and promotion is now fully supported by volunteers. Find out more about the [history of OpenRefine](#) and how you can [help the community](#).

Using OpenRefine - The Book



[Using OpenRefine](#), by Ruben Verborgh and Max De Wilde, offers a great introduction to OpenRefine. Organized by recipes with hands on examples, the book covers the following topics:

Open Refine

(<http://openrefine.org/>)

127.0.0.1:3333/project?project=1950048443811

Refine BL Flickr Images Book subset csv Permalink

Open... Export Help

Facet / Filter Undo / Redo 8287 rows Extensions: undefined

Show as: rows records Show: 5 10 25 50 rows « first < previous 1 - 10 next > last »

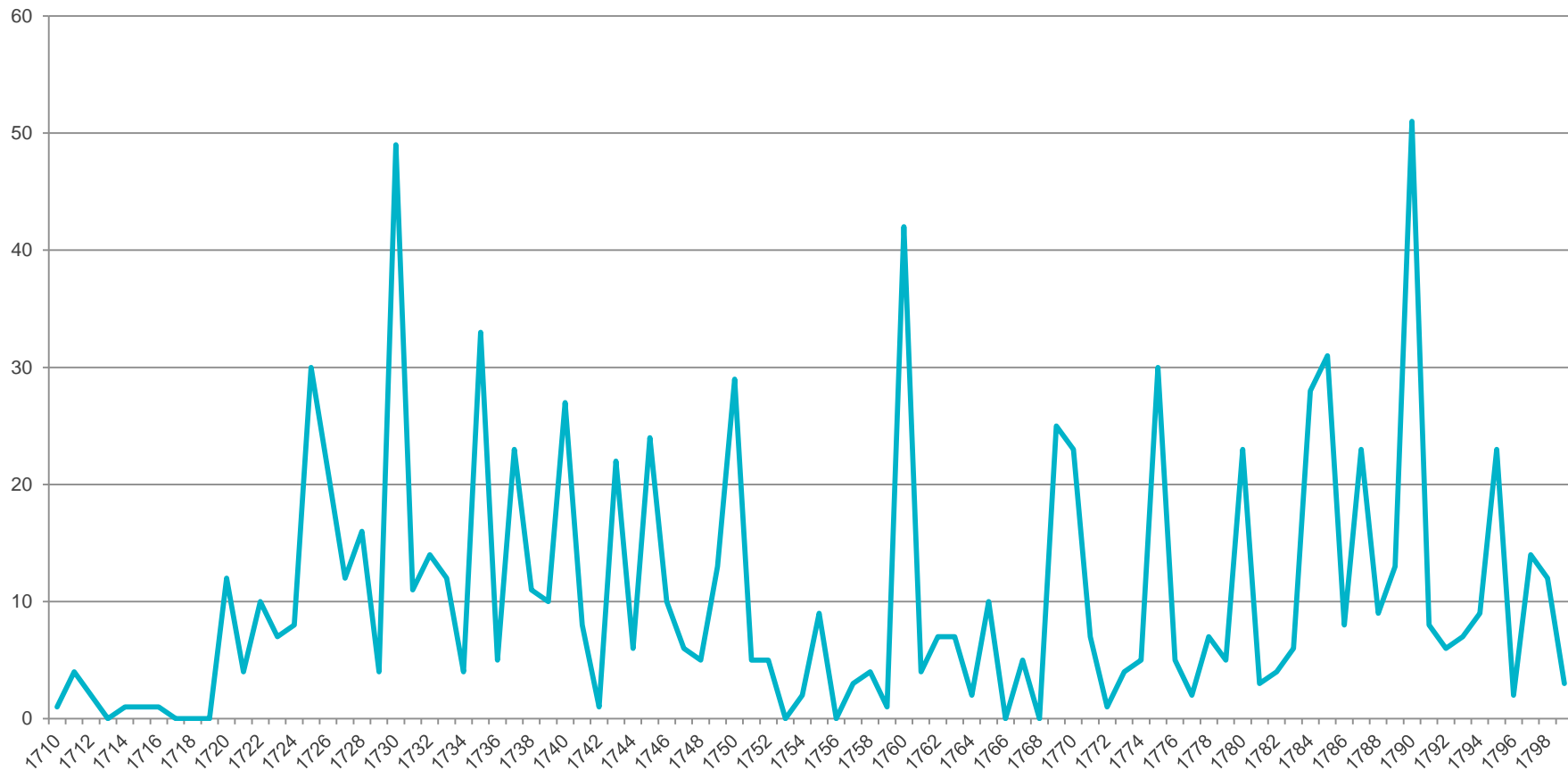
All	Identifier	Date of Publicat	Edition Stateme	Place of Publica	Publisher	Title	Author	Contributors	Corporate Auth	Corporate Contr	Former owner	Engraver	Issuanc
☆	1. 000000206	1879 [1878]		London	S. Tinsley & Co.	Walter Forbes. [A novel.] By A. A.	A. A.	FORBES, Walter.					monogra
☆	2. 000000216	1868		London; Virtue & Yorston	Virtue & Co.	All for Greed. [A novel. The dedication signed: A. A. A., i.e. Marie Pauline Rose, Baroness Blaze de Bury.]	A., A. A.	BLAZE DE BURY, Marie Pauline Rose - Baroness					monogra
☆	3. 000000218	1869		London	Bradbury, Evans & Co.	Love the Avenger. By the author of "All for Greed." [The dedication signed: A. A. A., i.e. Marie Pauline Rose, Baroness Blaze de Bury.]	A., A. A.	BLAZE DE BURY, Marie Pauline Rose - Baroness					monogra
☆	4. 000000472	1851		London	James Darling	Welsh Sketches, chiefly ecclesiastical, to the close of the twelfth century. By the author of "Proposals for Christian Union" (E. S. A. [i.e. Ernest Appleyard])	A., E. S.	Appleyard, Ernest Silvanus.					monogra
☆	5. 000000480	1857	A new edition, revised, etc.	London	Wertheim & Macintosh	[The World in which I live, and my place in it. By E. S. A. [i.e. Letitia Willgoss Stone.] Edited by ... J. H. Broome.]	A., E. S.	BROOME, John Henry.					monogra
☆	6. 000000481	1875	Fourth edition,	London	William	[The World in	A., E. S.	BROOME, John					monogra

Using facets and filters

Use facets and filters to select subsets of your data to act on. Choose facet and filter methods from the menus at the top of each data column.

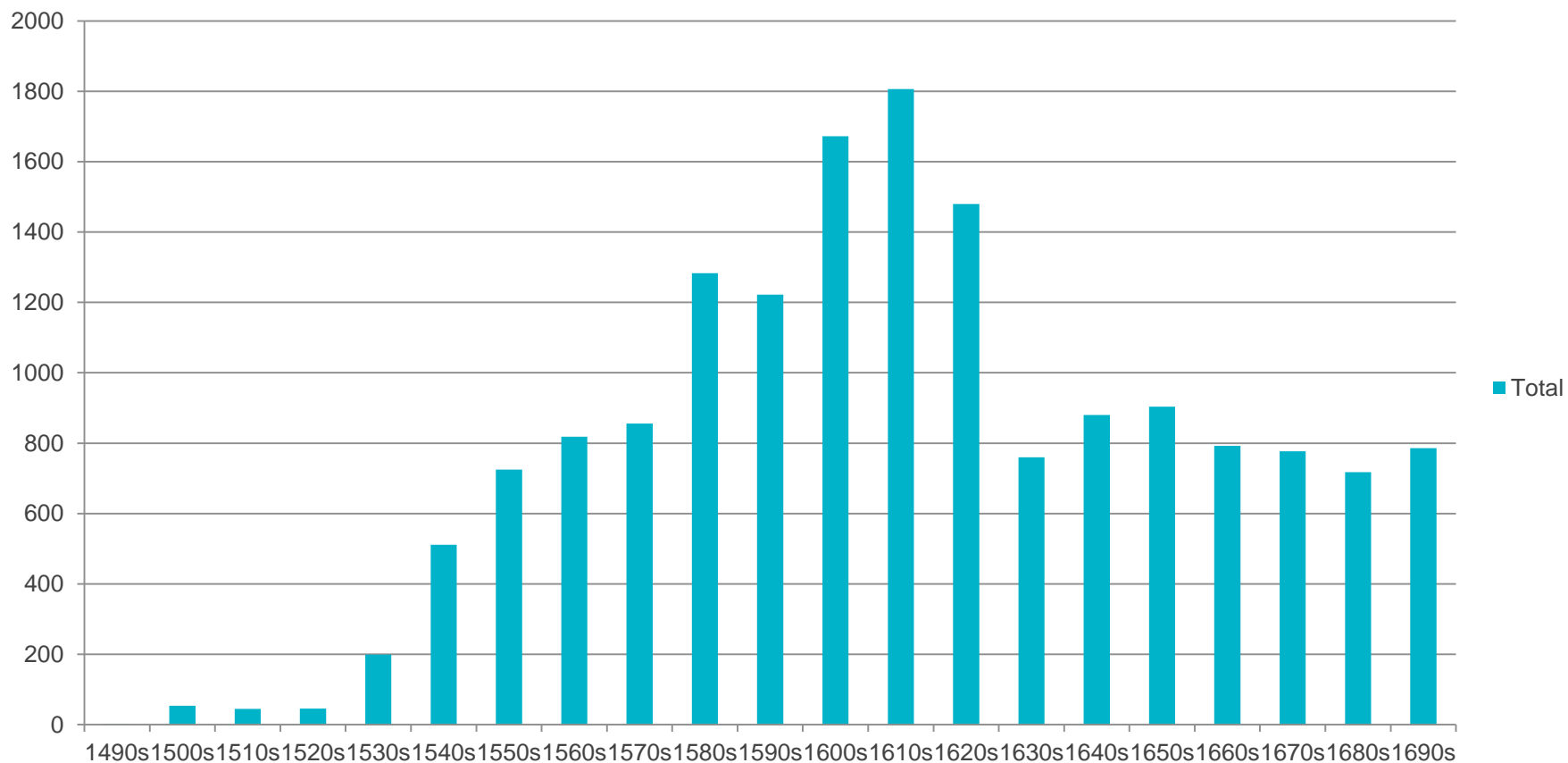
Not sure how to get started?
[Watch these screencasts](#)

Handel publications by date, as assigned in British Library catalogue

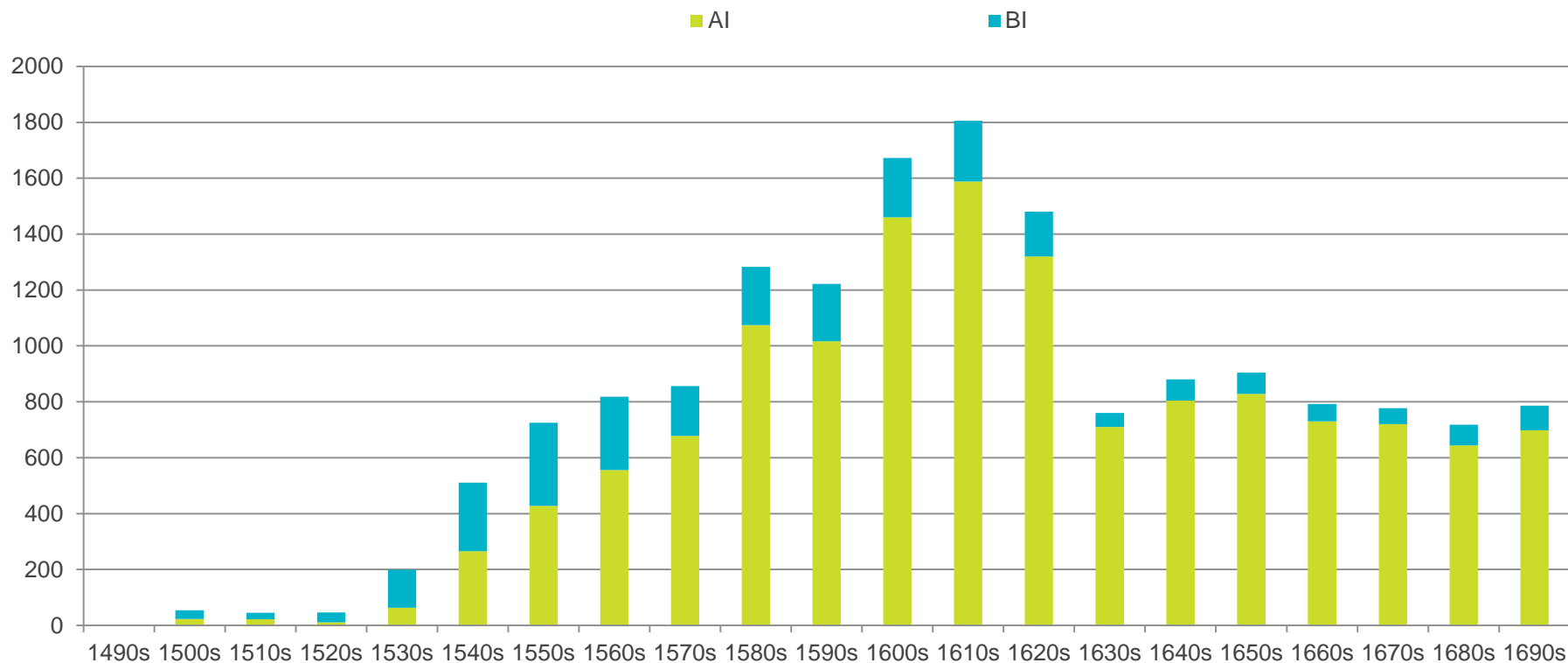


The rise and fall of music printing, 1500-1700

RISM A/I and B/I data

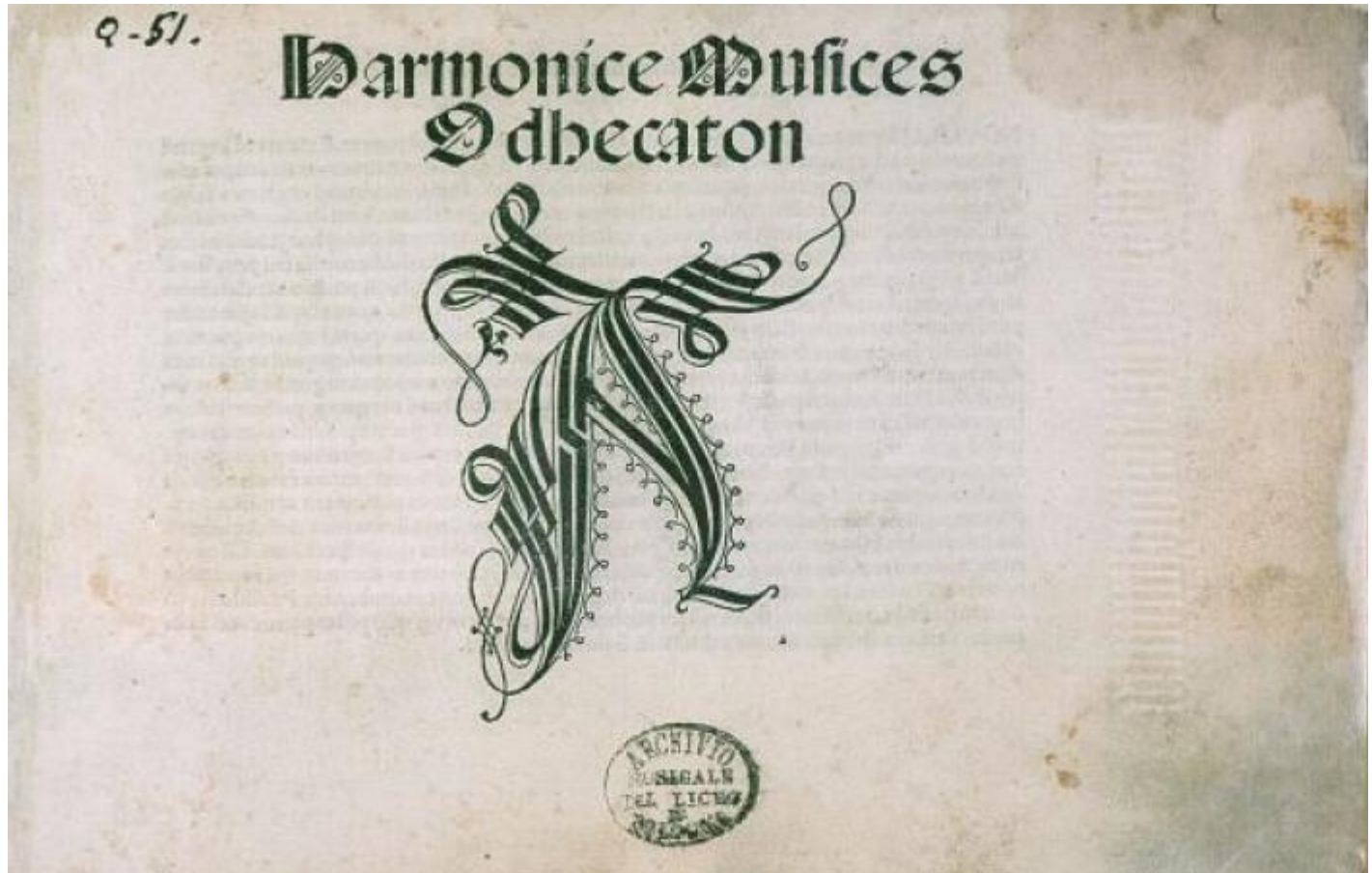


Single-composer prints (RISM A/I) versus anthologies (RISM B/I), 1500-1700



Petrucchi anthologies

*Harmonice
musices
Odhecaton*
[Canti A]
(Venice,
1501)





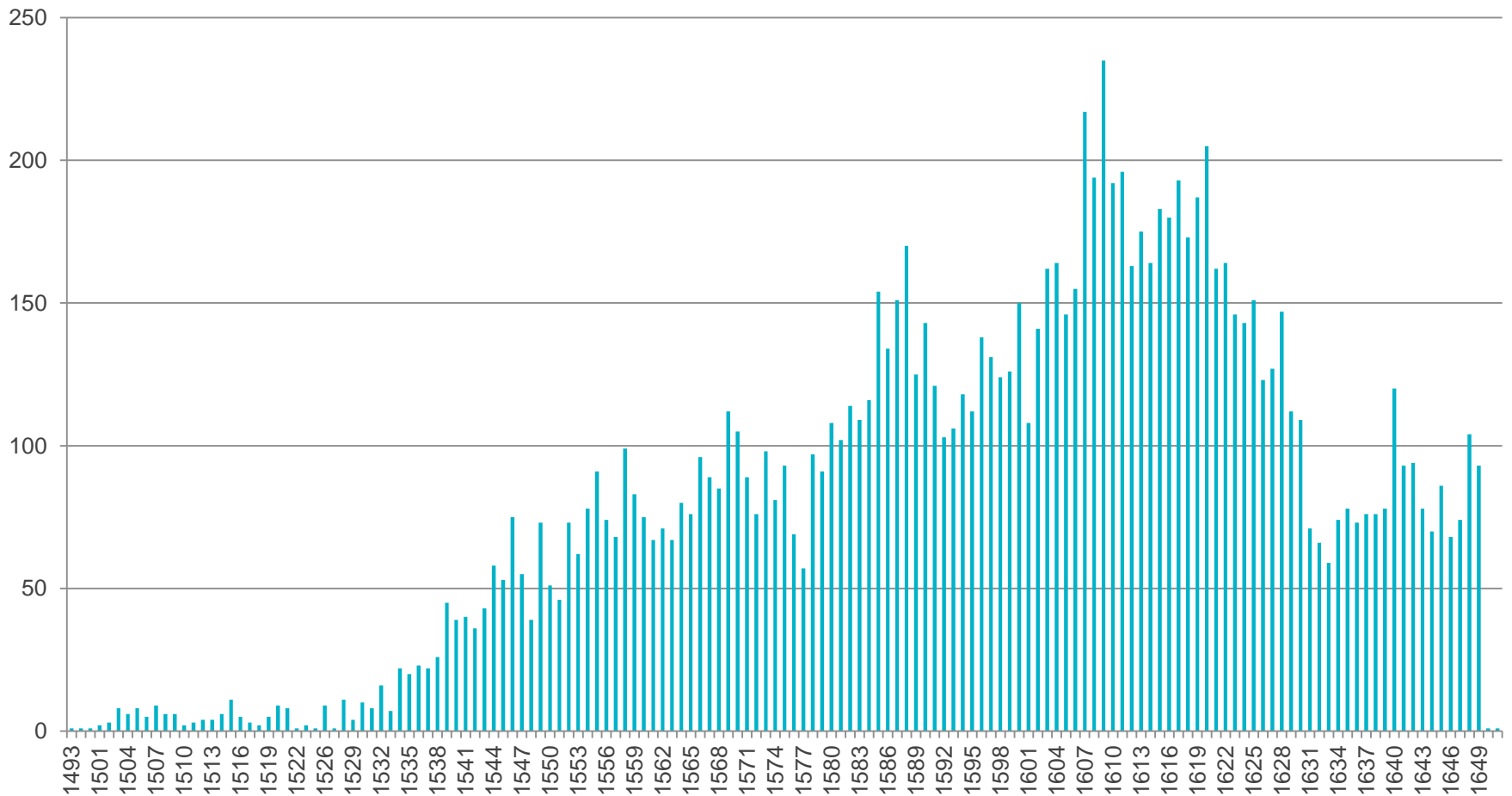
Monumentalising the composer

Lassus, *Magnum
opus musicum*,
Munich 1604

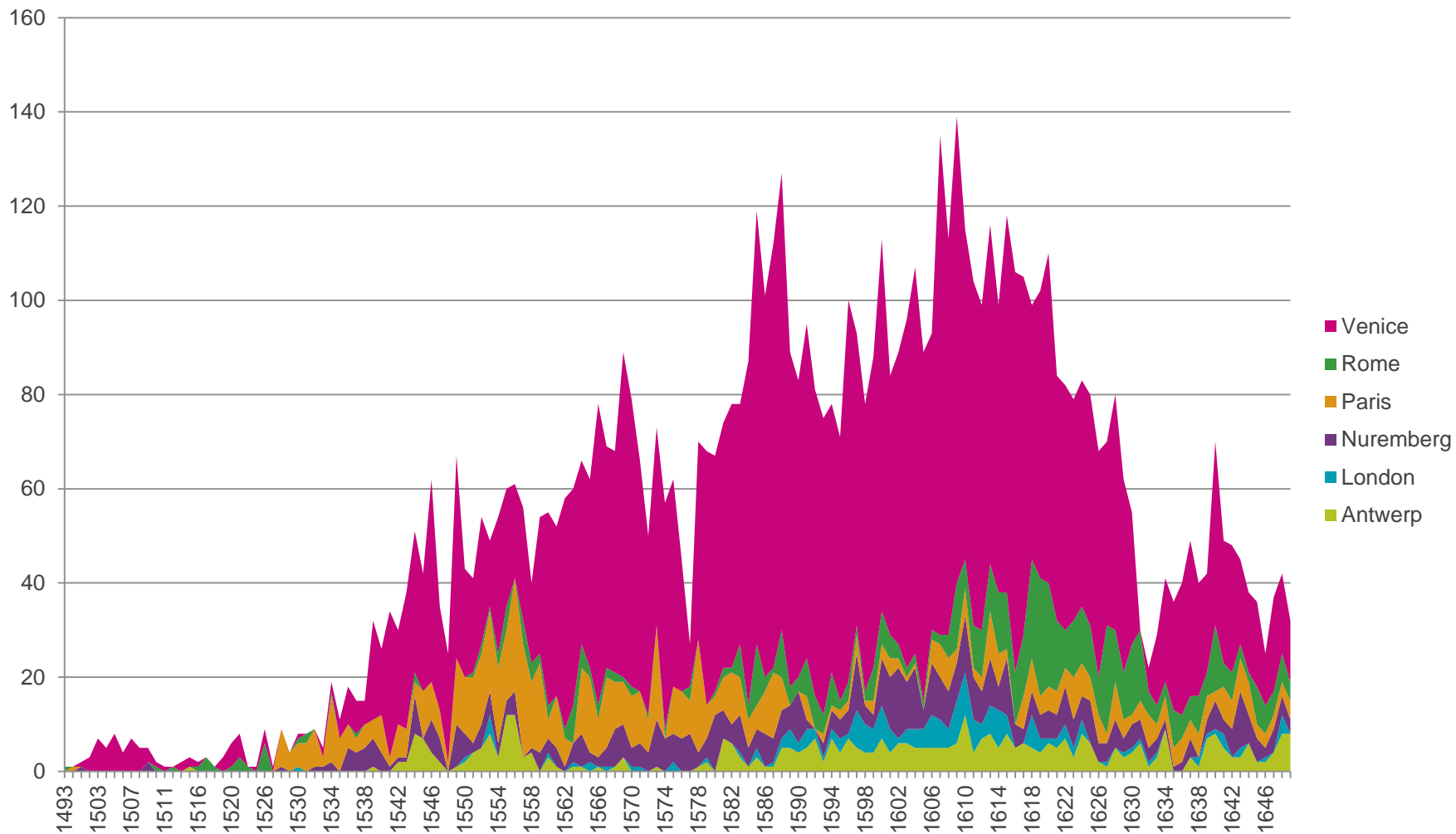


Music printing by year, 1500-1649

RISM A/I and B/I data



Music printed in major centres, 1500-1649





Venice – dips in 1571 and 1576/7



Battle of Lepanto, 1571



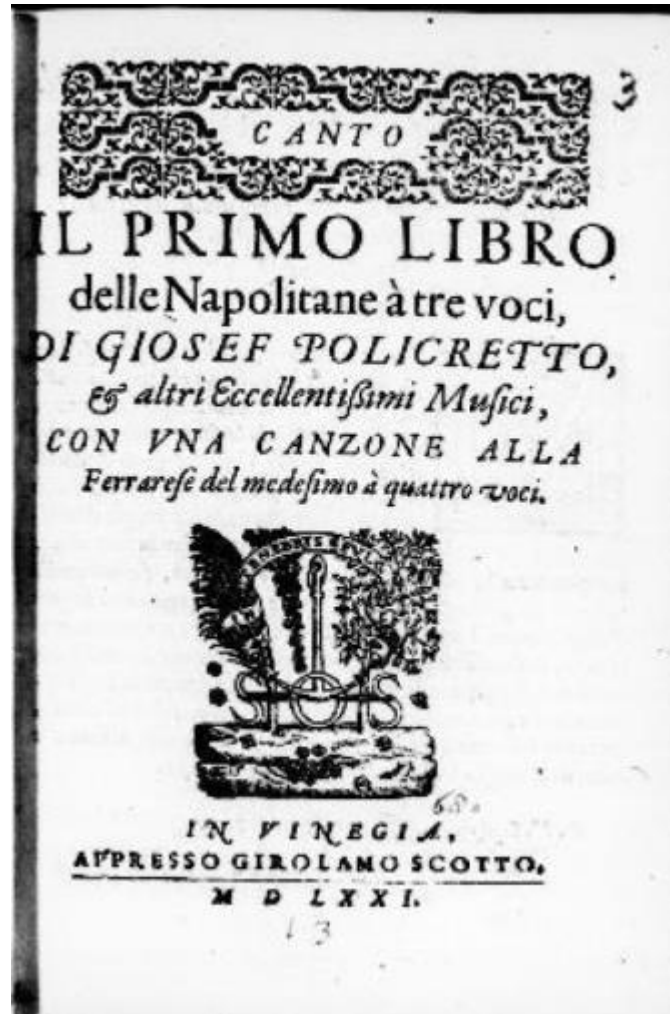
AllPosters

Plague, 1576/7
(including Titian's funeral)



Venice, 1571

*Il primo libro delle
Napolitane à tre voci,
Giosef Policretto, & altri
eccellentissimi musici
(Venice, 1571)*

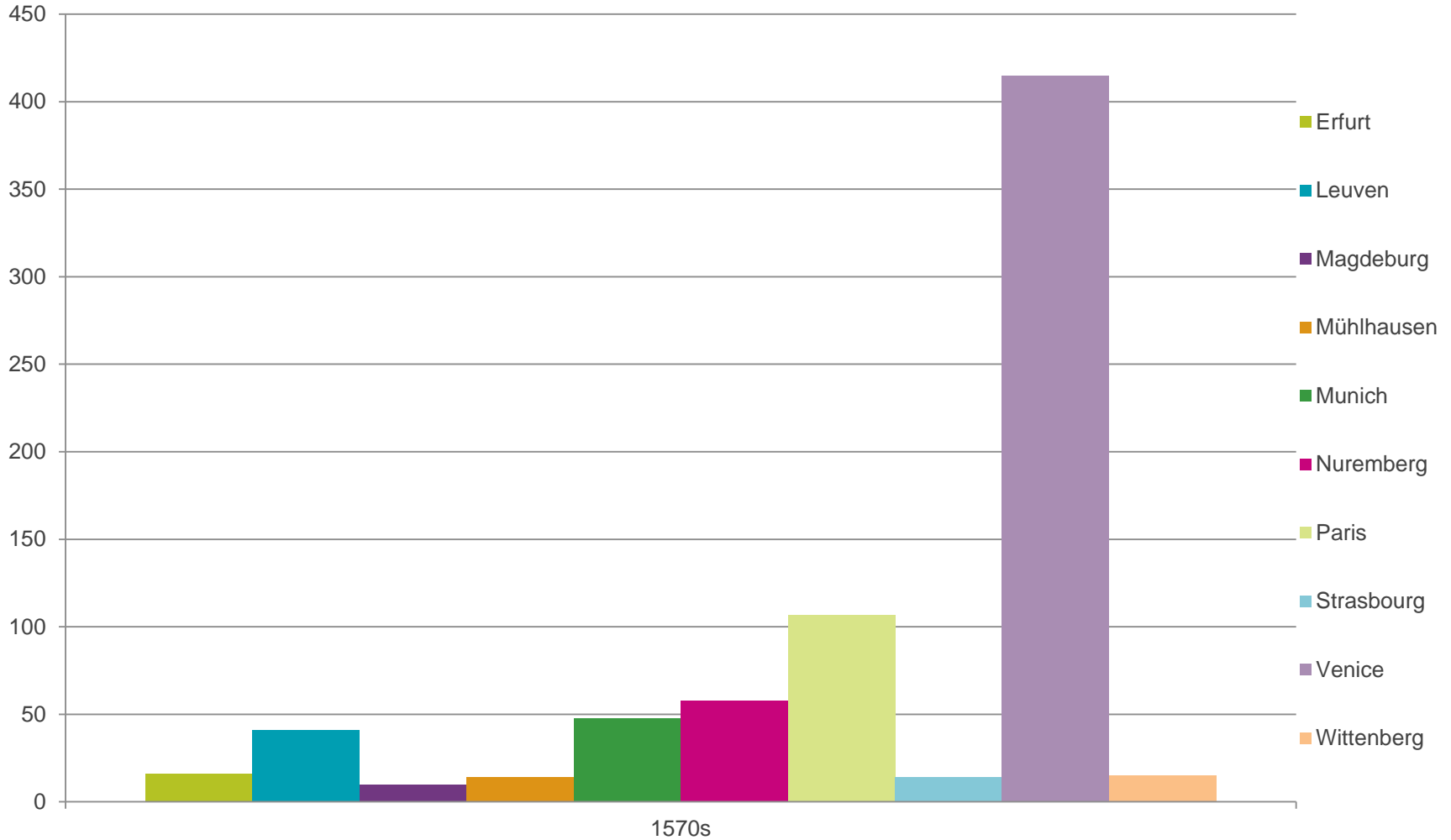


Lifespan of early modern industries

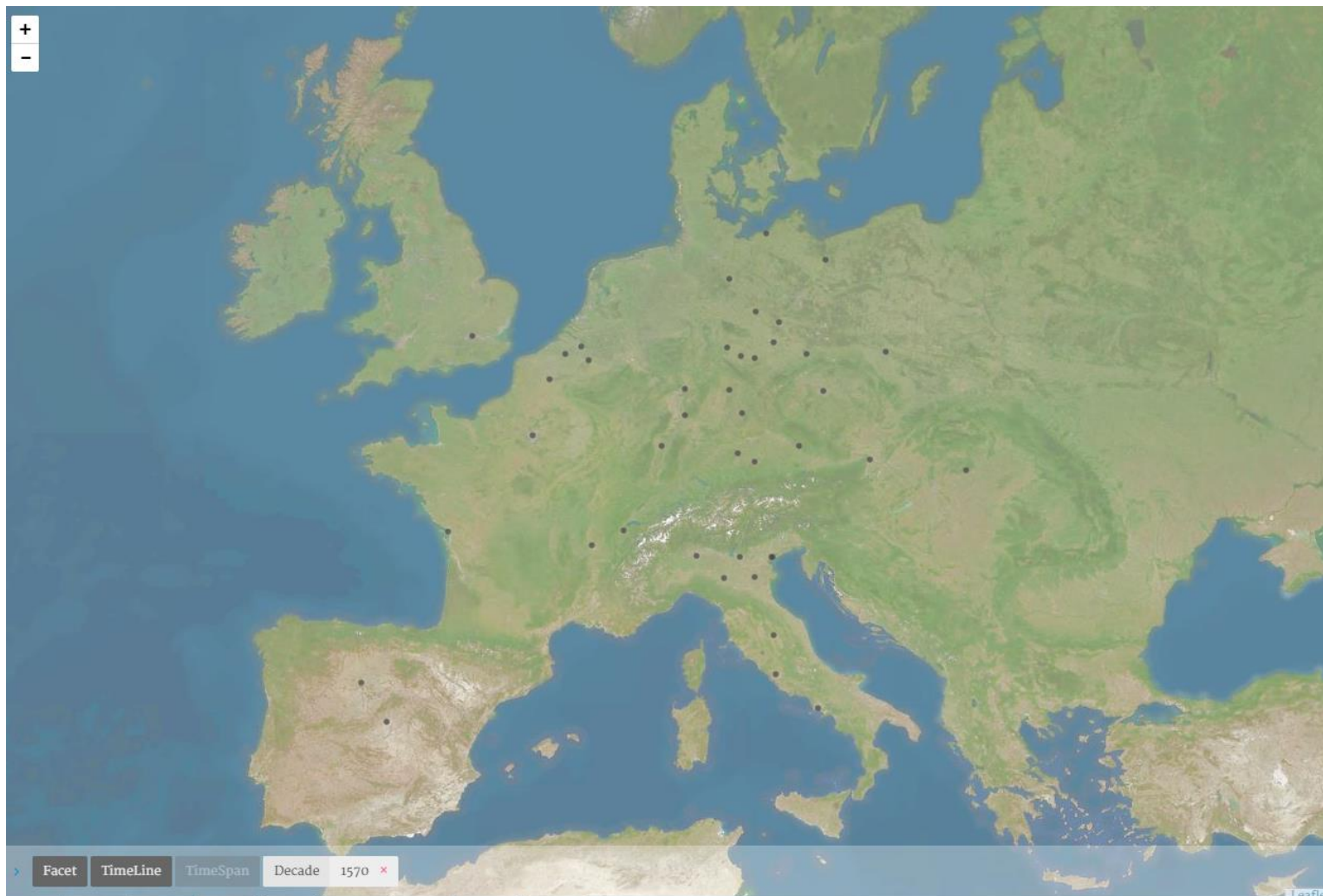
‘the typical pattern of a sharp rise followed by an abrupt fall can very easily be imagined as the probable profile in the pre-industrial economy’

(Fernand Braudel, *Civilization and capitalism: the wheels of commerce*, trsl. London 1982)

Main music-printing centres, 1570s

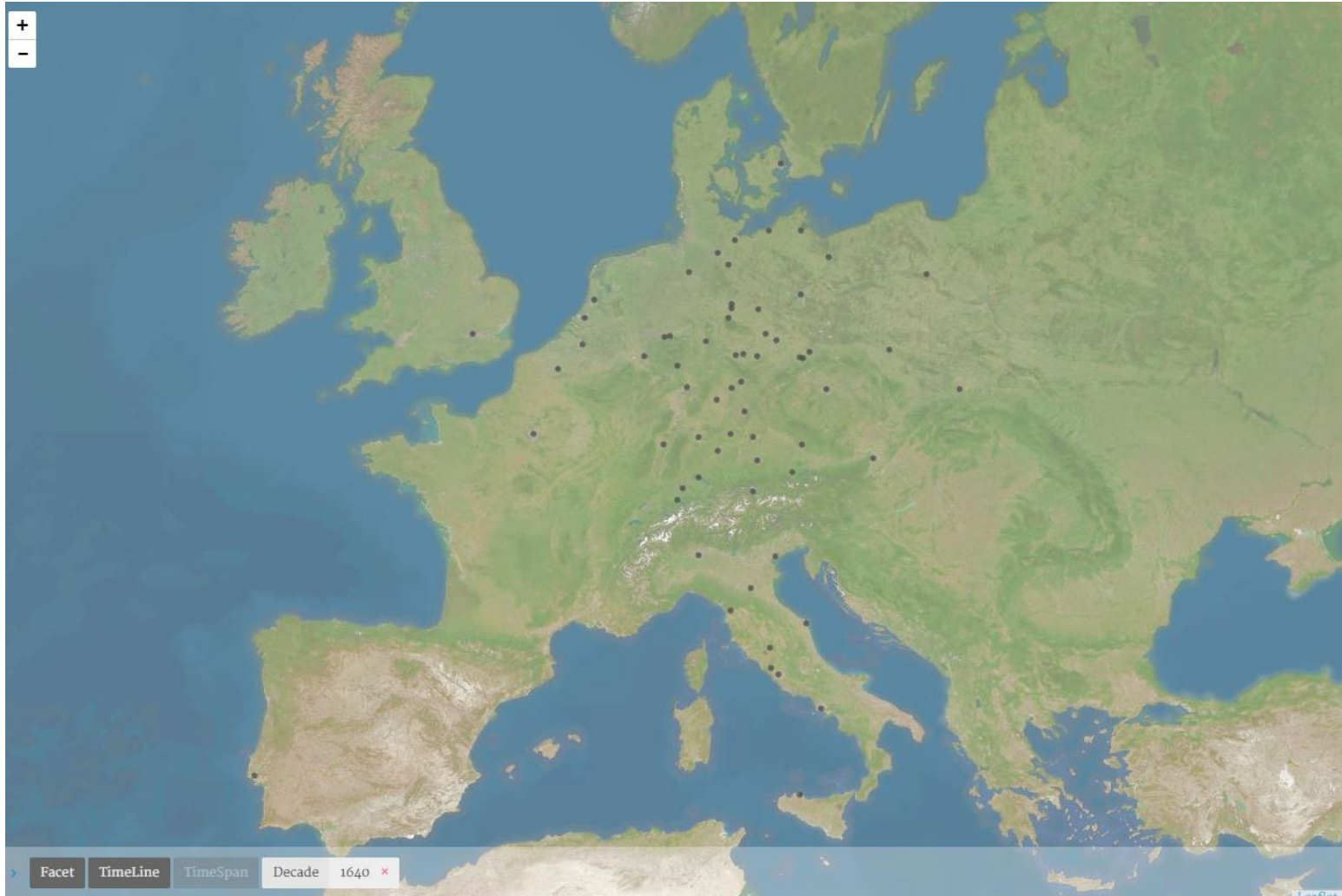


All music-printing centres, 1570s

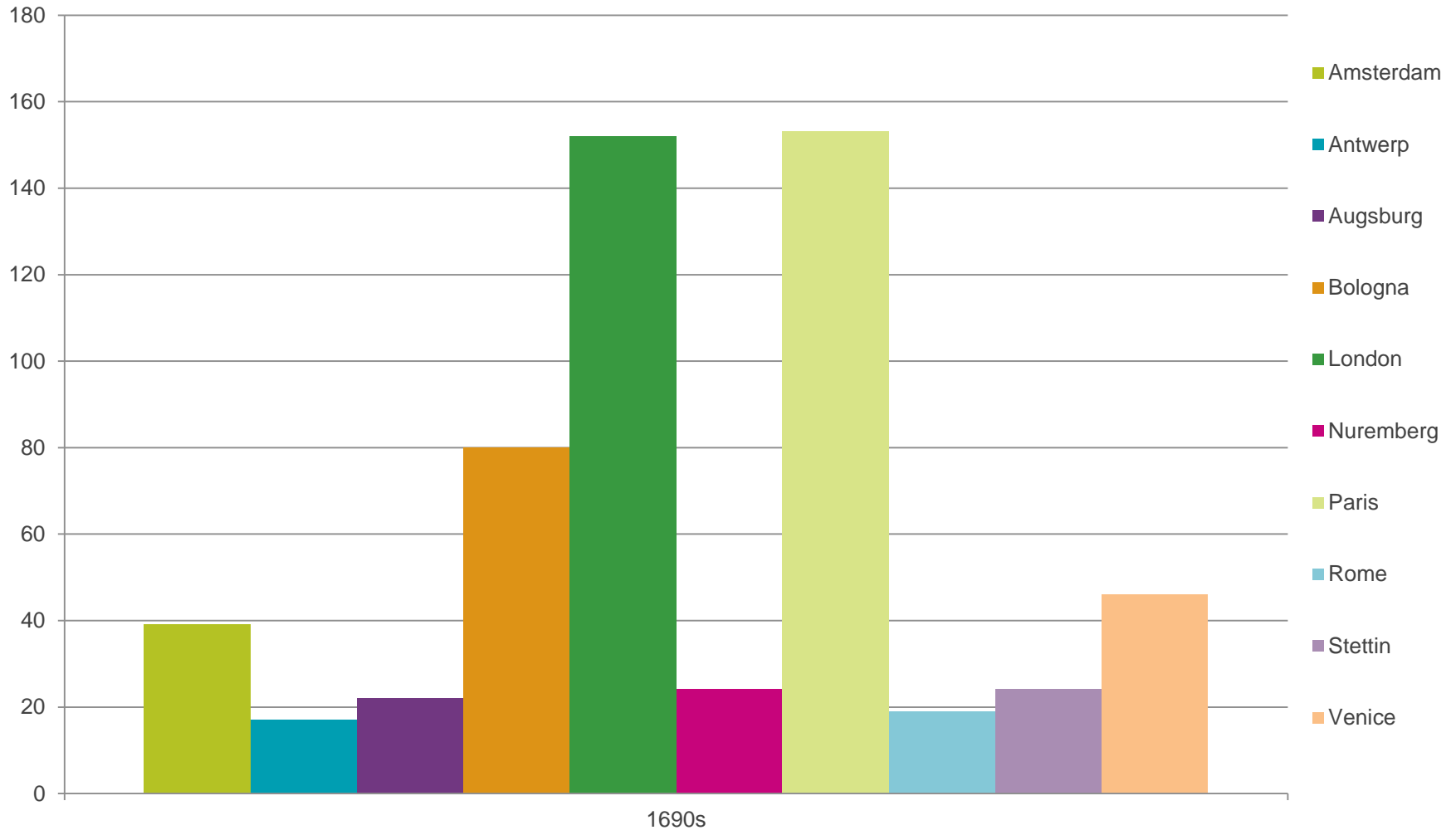




All music-printing centres, 1640s



Main music-printing centres, 1690s



Composer case-study:

Palestrina

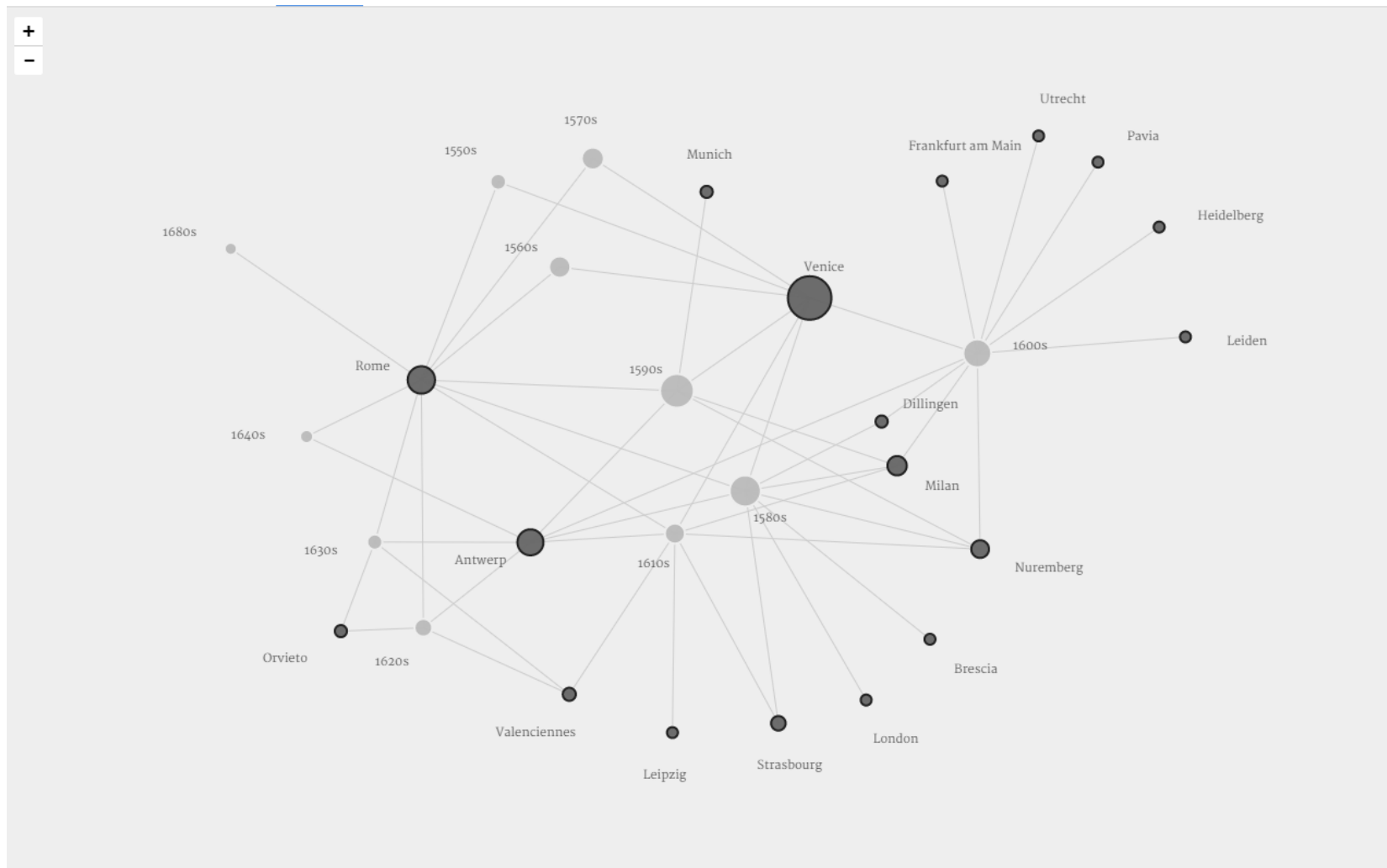


Palestrina – the archetypal Catholic composer?

Palestrina
presenting his
music to Pope
Julius III. *Liber
primus
missarum*
(Rome, 1554)



Palestrina: places & dates published





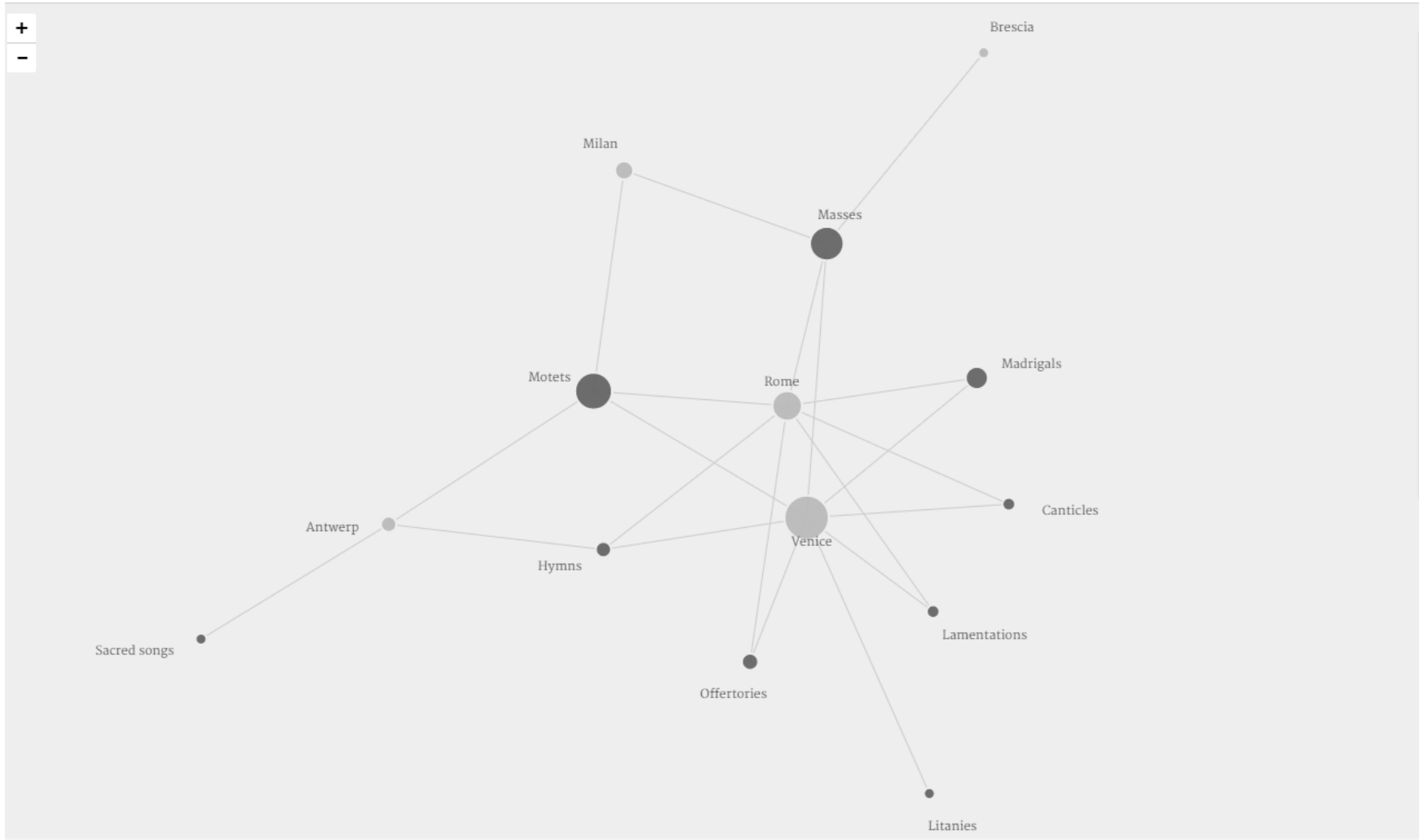
The myth of Palestrina as saviour of polyphony

Music would have come very near to being banished from the Holy Church by a sovereign pontiff had not Giovanni Palestrina found the remedy, showing that the fault and error lay, not with music, but with the composers, and composing in confirmation of this the Mass entitled *Missa Papae Marcelli*

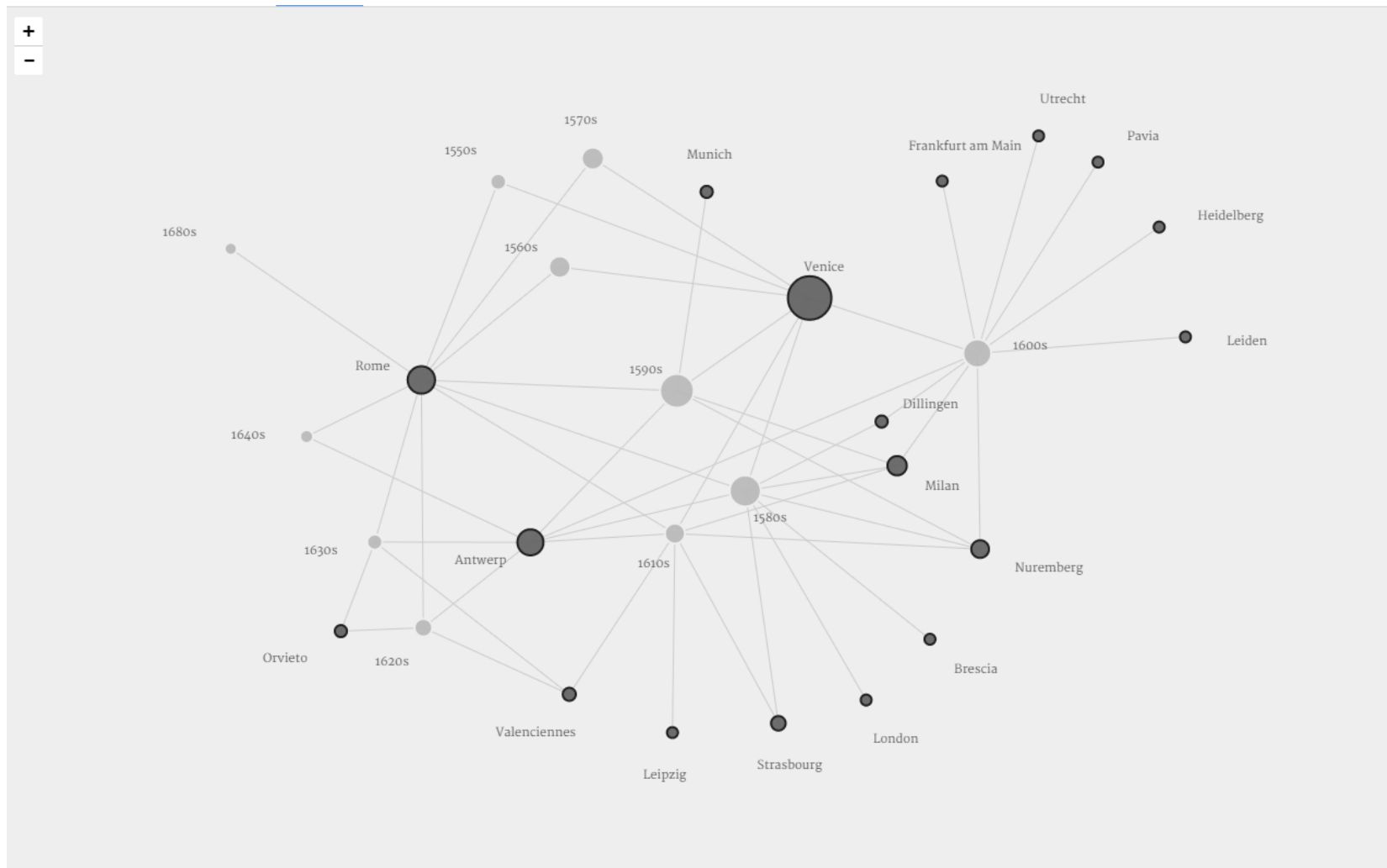


Agazzari, 1607

Palestrina: genres and places



Palestrina: places & dates published





Palestrina in the Protestant periphery

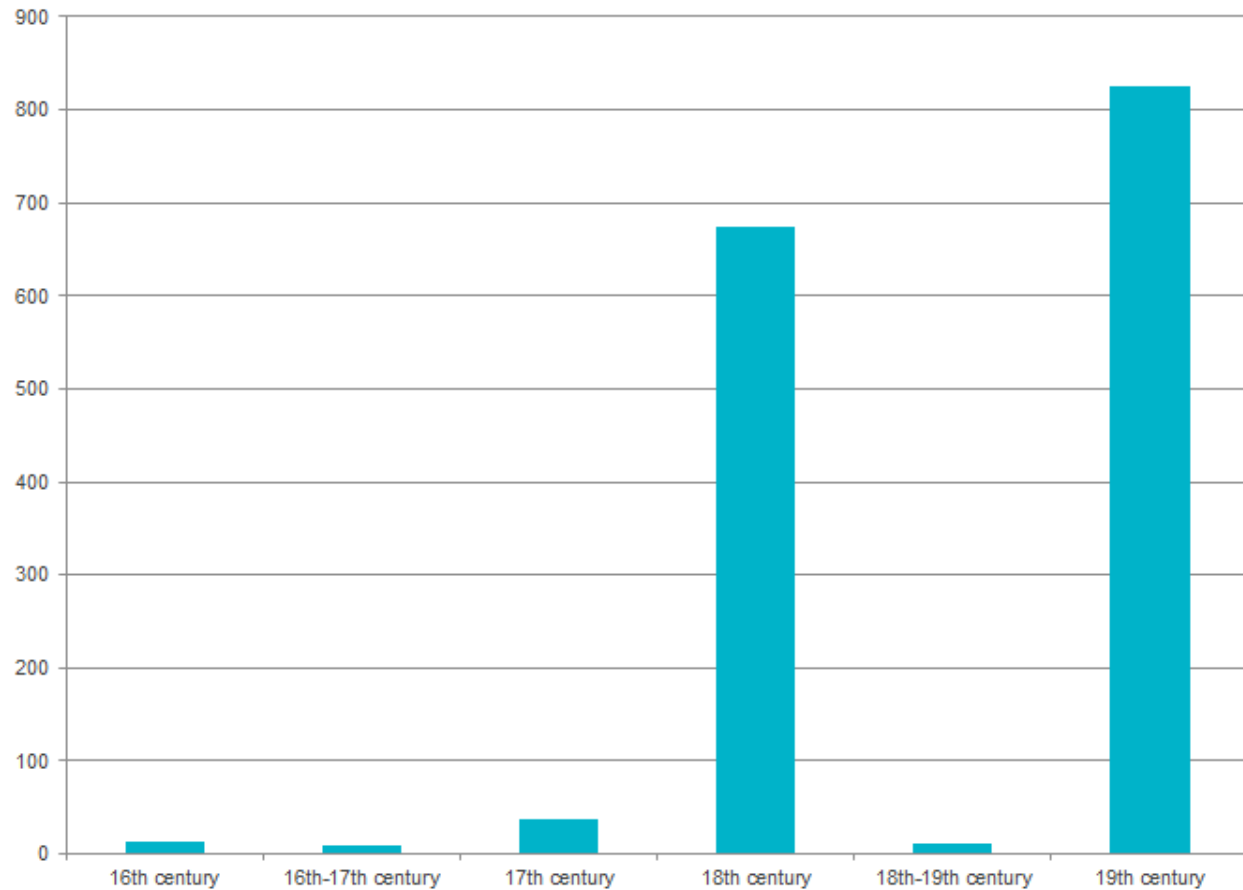
Palestrina's
madrigal
'Vestiva i colli'
Englished in
*Musica
transalpina*
(London,
1588)

Of 5. XXX. CANTVS. / Gianetto Palestrina.

SOUND out my voice, with pleafant tunes recording,
recor- ding, the new delight that Loue
to mee inspireth, :||: pleafd and content with that my mind de-
fireth, my mind de-fi-reth, thanked be Loue fo heauenly Ioyes affoording, the
that my plaints with rigor lóg reiec-ted, reiec- ted, bynding
my heart with thofe hir golden trefles, :||: in recompence of
all my long diftreffes, faid with a figh, thy grieft hath mee infected, faid
with a figh thy grieft hath mee in-fec- ted.

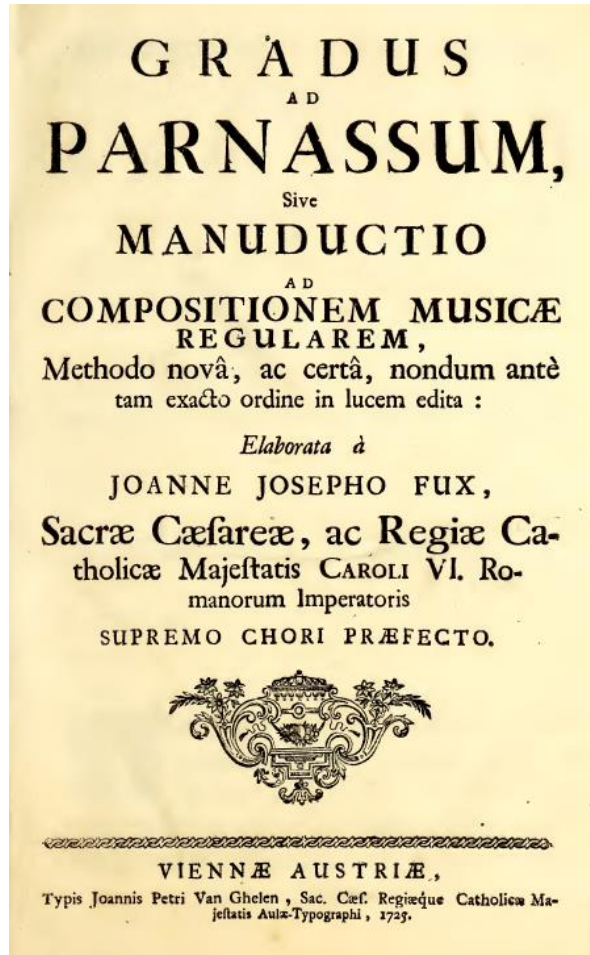
RISM A/II data

Palestrina manuscripts





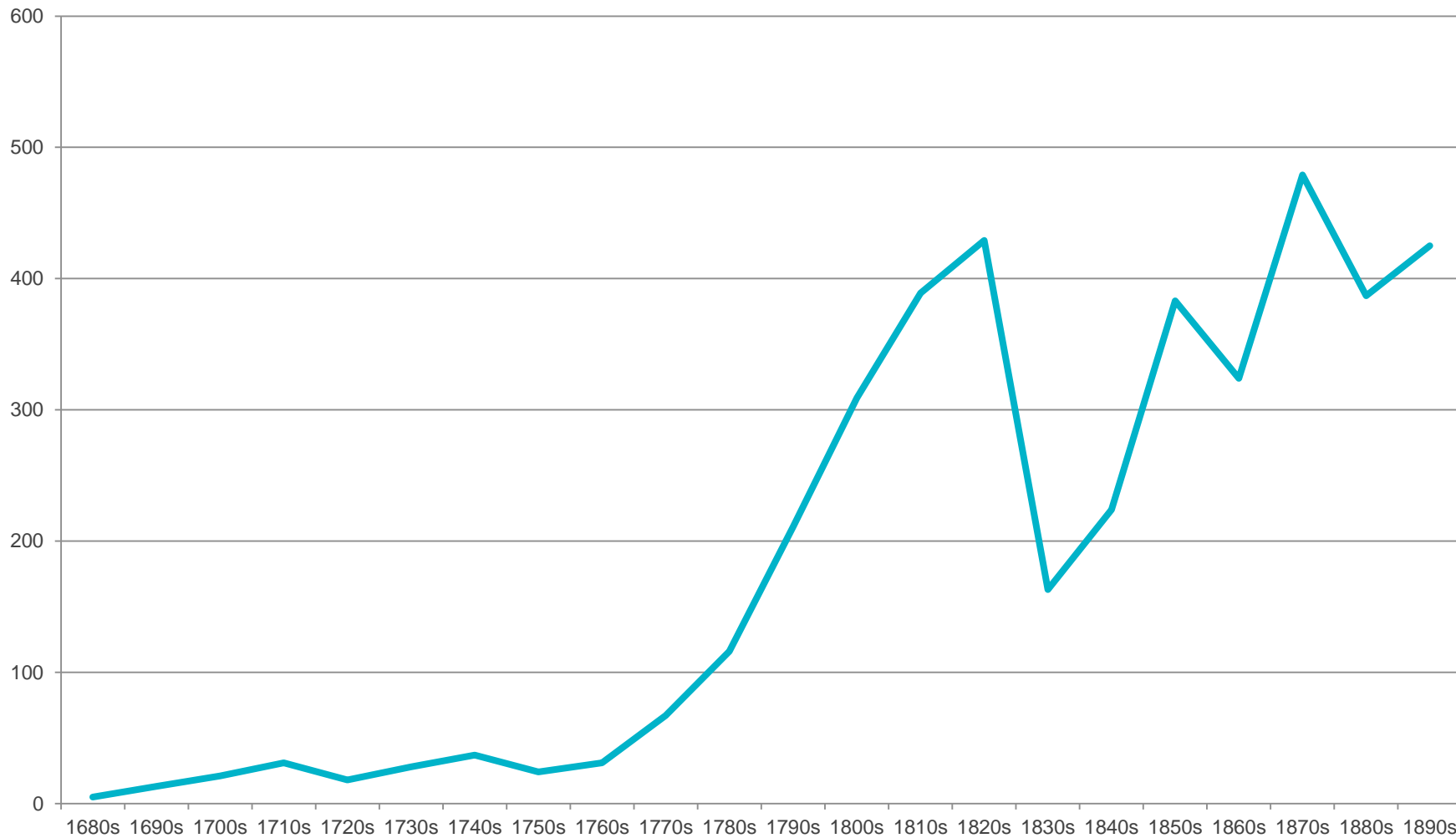
The cult of Palestrina



‘By *Aloysius*, the master, I refer to Palestrina, the celebrated light of music...to whom I owe everything that I know of this art, and whose memory I shall never cease to cherish with a feeling of deepest reverence’

Fux, *Gradus ad parnassum* (Vienna, 1725)

The rise of 'Scottish' music





from Restoration 'Scotch songs' ...

Pretty *KATE* of *Edenborough*:
BEING
A New Scotch Song,
Sung to the King at *WINDSOR*.



4r.
6. 28.
6. 15.

JUST when the young and blooming Spring had melted down the winter Snow,
 And in the Wood the Birds did sing their charming Notes on every Bough:
 Poor Willy sore bewailing his Fate, and woful Care, for loving, loving, loving,
 and despairing too, alas! he'd cry, that I must dye, for pretty Kate of Edenborough.

A New Scotch Song sung to the King at Windsor, c.1685



...to Ossian and the noble savage



ADDRESS to the SUN #1
from the Poems of Ossian
Vide Carthor. Vol I. Page 95 last Edit. 17.
Set to MUSIC by
J. W. Callcott. Pr. 6^d

London. Printed for the Author and Sold by Catherine Fentum N^o 417 Strand.

Larghetto
Sostenuto

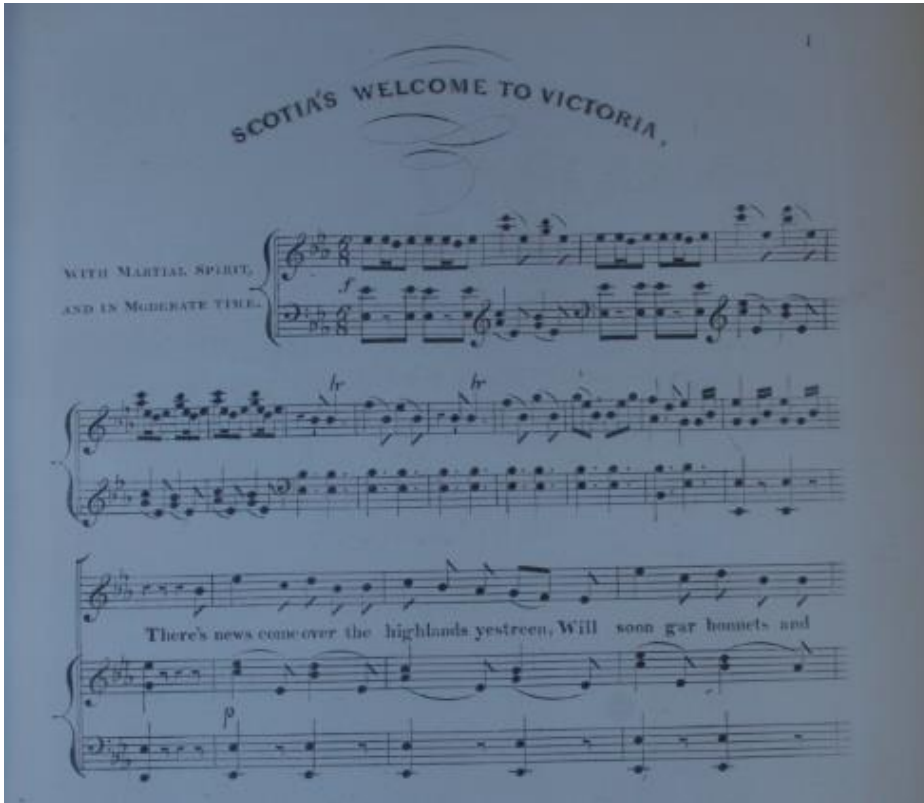
O thou that radiest a-
bove round as the Shield of my Fathers, Whence are thy
beams O Sun thy everlasting light, thy ever-lasting light,
Thou comest forth thou comest forth In thy awful

A page of a musical score for the song 'Address to the Sun'. The score is written in G major and 3/4 time. It features a vocal line and a piano accompaniment. The tempo is marked 'Larghetto' and 'Sostenuto'. The lyrics are written below the vocal line. The score includes various musical notations such as notes, rests, and dynamic markings.

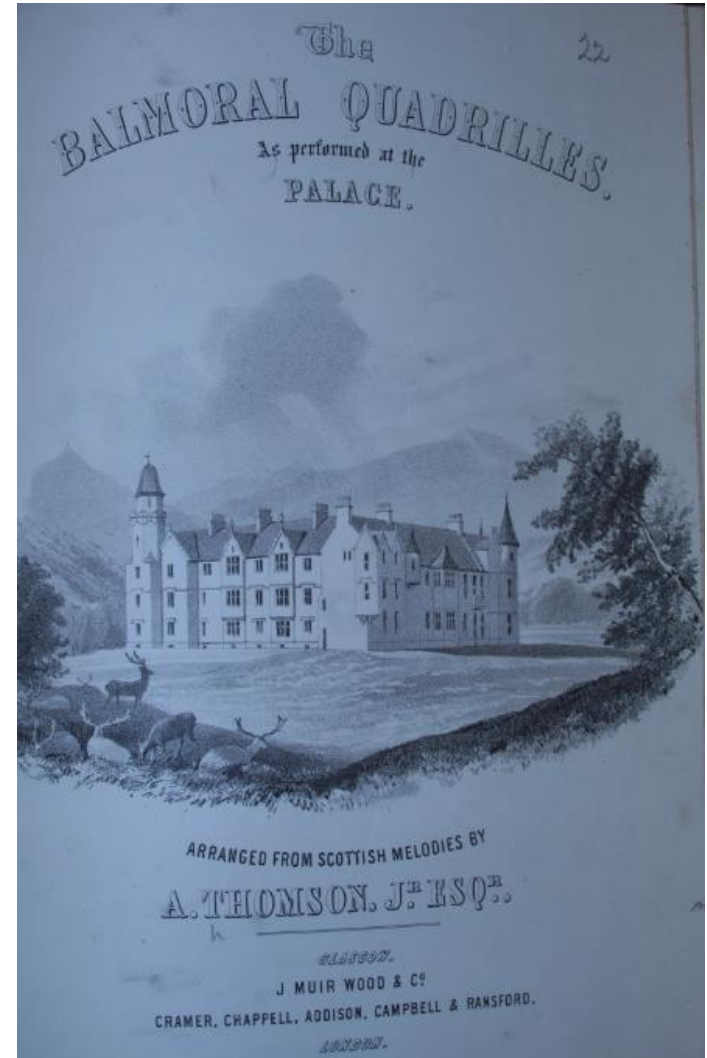
Address to the Sun from ... Ossian, c.1783



Queen Victoria's visits from 1842



'Scotia's welcome to Victoria', arr.
Henry Bishop c.1842



The Balmoral Quadrilles c.1850

Download data from
www.bl.uk/bibliographic/download.html

Contact

stephen.rose@rhul.ac.uk
sandra.tuppen@bl.uk

A Big Data History of Music was funded by
the Arts and Humanities Research Council