Encoding Old Hispanic neumes

I propose to discuss the taxonomy of OH notation from a palaeographical point of view using as case of study the neumes of the León Antiphoner. Subsequently, I present the 'Chant Editing and Analysis Program' which has been developed to encode, store and make automated analysis of OH neumes.

OH neumes are found in 10th -13th century manuscripts from Iberian Peninsula. Among the early Western European notations, OH notation set itself aside because of its complexity and the richness of neume shapes used. In spite of its potential richness of musical information, OH notation has been almost neglected by previous scholarship because of the lack of later versions of the same chants, written with a more precise notational system, which could give a clue towards an understanding of the melodic content.

The most important OH manuscript is the early-tenth-century León Antiphoner. It has not only the richest set of graphical varieties for basic neume shapes ('punctum', 'pes', 'torculus', etc.) among the OH manuscripts but also, the greatest assortment of graphical elements placed near the notation with the purpose of adding musical information. For these reasons, we consider the Antiphoner the perfect testbed for a taxonomy of OH notation.

OH notation is adiastematic: it represents just the outline of a melody, without specifying intervals or pitches. The inclination of the pen-stroke tells us if the melody goes up or down. Since we never know for sure what the pitch of the first note of a neume is, we call it 'neutral' (N); it is almost always possible to identify the melodic contour of the following notes of a neume using the direction of the pen-strokes: each note is either higher than (H), lower than (L), or the same as (S) the previous one. While in the usual modern terminology a 'torculus' consists of a note followed by a higher and then a lower note, we prefer to identify such a shape as 'NHL'. Similarly, modern terminology for a note followed by two higher notes and then a lower one would be 'scandicus flexus', but we have preferred the label 'NHHL'.

All the neumes in the Antiphoner derive from the combination of three factors: 1) palaeographical features of the pen-stroke such as orientation, inclination and length; 2) connections between notes within a neume: gapped  , angular , curved  , and looped  ; 3) presence of the hook, which is an optional element added at the end of some neumes. The second and third factors apply only to compound neumes, that is, neumes containing two or more notes, whereas a simple neume can be described in palaeographical terms only according to the parameters of its pen-stroke. Variations in these three palaeographical factors do not

change the number of notes involved in a neume shape; instead, they appear to reflect different performance possibilities possibly related to vocal articulation, ornaments, rhythmic nuances etc. Unfortunately, the precise melodic meaning of many of the differentiated palaeographical elements remains uncertain.

A palaeographical study can help to identify the variants in neume shapes that result from the vagaries of an individual scribe's hand rather than having a specific musical meaning. In addition to this, understanding the morphology of the neumes and their constituent elements can be crucial in setting neume boundaries. A subsequent step in the study of OH chant consists in making musical analysis and comparisons between chants. The 'Chant Editor and Analysis Program' (from now onwards CEAP), is designated to undertake automated musical analysis of the OH chant. CEAP is the first chant database project to put into machine-readable format OH neumes. CEAP allows neumes to be transcribed in a form which retain as far as possible the appearance of the original manuscript. We have arranged the neume shapes in the León Antiphoner in the CEAP menu according to the number of pitches involved and according to their melodic outline (=combination of N, H, L, S). Each neume is identified by its melodic interpretation and connection type(s), for example '  ' is NgH (Neutral-gapped-Higher). Our labels, then, are directly derived from the melodic contours of the neumes, and are nuanced, where necessary in the context, with further information about the palaeographical features of the neume in question. The vertical position on the page does not always carry melodic meaning, but it is preserved in the data input and will be scrutinised in future analyses.

CEAP's main existing analytical feature is approximate matching of melodic contours, it allows seeking related neume patterns and/or single notational shapes. This helps the user find related sections of melody, even though they might not be identical, and are only partially described by the notation. CEAP can help to understand the circumstances under which the neumes are used allowing analysis of the combinatory melisma construction, and of the way melisma segments permeate the repertory.

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Keywords:

Old Hispanic, neume notation, taxonomy, database

Short statement regarding your current interests related to music encoding:

My interest in music encoding is related to my current research on the palaeography of OH notation. The challenges that this repertory pose require to use non-conventional methodology to analyse it. The aim is to develop a system to 'faithfully' transcribe OH neumes into a machine-readable format and then make automated analysis of OH chant. The goal is to make comparative analysis of neume patterns that, without the assistance of computer software, would be beyond human capabilities and extremely time consuming.

MEC 2016 Program

All talks and keynotes will take place in Tanna Schulich Hall in the Elizabeth Wirth Music Building.

Pre-conference: Tuesday, May 17th, 2016

Time	Type	Title	Authors/Presenters
9:00-12:00	Workshop I	Verovio – current status and future directions	Laurent Pugin
2:00-5:00	Workshop I	Verovio – current status and future directions *NB: This will be the same content as the 9-12 session*	Laurent Pugin
9:00-12:00, 2:00-5:00	~~Workshop II~~	~~Cataloging with MEI: Working with MEI metadata in the Detmold Court Theatre Project~~ CANCELLED	~~Kristina Richts & Irmlind Capelle~~
9:00-12:00, 2:00-5:00	Workshop III	Encoding Music at Music Encoding	Jim DeLaHunt
9:00-12:00, 2:00-5:00	Workshop IV	Introduction to the Music Encoding Initiative	Perry Roland

Conference Day 1: Wednesday, May 18th, 2016

Time	Type	Title	Authors/Presenters
9:00-9:45	Keynote I	Julia Flanders: The Provocation of Music: Evolving Paradigms for Markup	Julia Flanders
9:45-10:00	**short break/ discussion**		
10:00-10:30	Talk	Prototypical Scenarios for Contextual Navigation with MEI and Linked Data	Kevin Page, David Weigl, David Lewis, and Carolin Rindfleisch

10:30-11:00	Talk	A Digital Score Library Based on MEI	Raphaël Fournier-Sniehotta, Philippe Rigaux, and Nicolas Travers
11:00-11:30	**break**		
11:30-12:00	Talk	An MEI module proposal for hierarchical analysis	David Rizo and Alan Marsden
12:00-12:30	Talk	XML Music Performance Description	Axel Berndt and Benjamin W. Bohl
12:30-1:30	**lunch**		
1:30-2:00	Talk	Wie? Was? Entsetzen! Lessons learned from the Freischütz Digital project	Johannes Kepper and Joachim Iffland
2:00-2:30	Talk	The Freischütz debut performance in Vienna: Encoded representation of performance-related modifications of the score	Agnes Seipelt
2:30-3:00	Talk	Encoding Music Performance Data	Johanna Devaney and Hubert Léveillé Gauvin
3:00-3:30	**break**		
3:30-4:00	Talk	Andrew Hughes and his Legacy of Music Encoding	Katherine Eve Helsen
4:00-4:30	Talk	Meter and Rhythm in Digital Encodings of Fourteenth-Century Mensural Polyphony	Karen Desmond
5:00-5:30	Talk	Encoding Music As People Play It: MEI and the role of tablatures in capturing musical performance	Tim Crawford, Jessica Schwartz, David Lewis, and Richard Lewis
5:30-6:00	Talk	The Wolfenbüttel Lute Tablature: Convergence of Lute Tablature and Mensural Notation	Rebecca Shaw

Conference Day 2: Thursday, May 19th, 2016

Time	**Type**	**Title**	**Authors/Presenters**
9:00-9:30	Talk	Teaching Digital Music Scholarship through MEI Fellowships	Matthew Vest, Purdom Lindblad; Jeremy Boggs, and Perry Roland

9:30-10:00	Talk	An Empty House? Delius, Beecham, and using MEI to inform performance	Joanna Bullivant
10:00-10:30	Talk	Chants that Defy Classification: Implications of the Need to Categorize in the Cantus Database	Debra Suzanne Lacoste and Barbara Swanson
10:30-11:00	Talk	MerMEId in practice	Wolfram Albrecht Enßlin and Klaus Rettinghaus

Poster Session

Time	Type	Title	Authors/Presenters
11:00-12:30	Poster	An MEI Score Alignment Application	Andrew Horwitz, Andrew Hankinson, and Ichiro Fujinaga
11:00-12:30	Poster	Bidirectional Conversion Between MEI and Abjad	Jeffrey Treviño
11:00-12:30	Poster	Julius: A Web Interface for Realtime Collaborative and Scriptable MEI Document Editing	Christopher Antila, Andrew Horwitz, Jeffrey Treviño, Simon Whitmell, and Sienna Wood
11:00-12:30	Poster	Sources of the Detmold Court Theatre Collection Visualization of combined cataloging and transcription processes using MEI, TEI and the Edirom	Irmlind Capelle and Kristina Richts
11:00-12:30	Poster	A musicological edition in a virtual environment: Integrating the Anton Webern Gesamtausgabe in SALSAH	Stefan Münnich
11:00-12:30	Poster	A new MEI module for encoding genetical processes	Maja Hartwig, Richard Saenger, and Johannes Kepper
11:00-12:30	Poster	Music artificial intelligence use cases as motivation for music encoding design	Tom Collins and Christian Coulon
11:00-12:30	Poster	Aggregation and Peer Review for Digital Projects in Music	Timothy Duguid
11:00-12:30	Poster	Lessons learned in crowd-sourced encoding of public domain classical music scores Paper	Jim DeLaHunt
11:00-12:30	Poster	An MEI-based commercial application: customization and styling	Zoltán Kőmíves and Alexander Erhard
11:00-12:30	Poster	MEI and Polona: Confronting Strategies for Encoding Musical Materials in Digital	Urszula Horoszko and Sonia Wronkowska

		Libraries	
12:30-1:30	**lunch**		

Talks resume

Time	Type	Title	Authors/Presenters
1:30-2:00	Talk	Hartker's XML: The Optical Neume Recognition Project and MEI	Katherine Helsen, Jennifer Bain, Andrew Hankinson, Inga Behrendt, Ichiro Fujinaga
2:00-2:30	Talk	Encoding Old Hispanic neumes	Elsa De Luca
2:30-3:00	Talk	DEAR Melody: Digital Encoding, Analysis & Reconstruction of Melody in Music of Indian Subcontinent	Indranil Roy
3:00-3:30	**break**		
3:30-4:00	Talk	On Intermediary Formats	Reiner Krämer
4:00-4:30	Talk	Lychee: An Engine for MEI Document Management and Conversion	Christopher Antila and Jeffrey Treviño
4:30-5:00	Talk	Separating Content From Presentation – A New Approach to Encode Rendering Hints in LilyPond	Urs Liska
5:00-5:15	**short break**		
5:15-6:00	Keynote II	Richard Freedman: "Music, MEI and the Arts of Quotation"	Richard Freedman

Un-conference: Friday, May 20th, 2016

Time	Event
9:00 – 10:00	MEI Community Meeting
10:00 – 4:00	Self-organized activities running in parallel, including an MEI Hackathon and meeting times for Special Interest Groups.
7:00 – 8:30	Public Lecture and Concert at Redpath Hall