Department of Music, University of California, Santa Barbara, USA

Scholarship in Cyberspace : Music Research in the Digital Age

Abstract: Digital resources for humanistic research have expanded dramatically in the last two decades. Scholars can browse libraries and archives located around the world and read digitized documents on networked computers in the comfort of their university offices and private homes. This essay identifies and discusses several electronically accessible archives and bibliographic sources in the field of music theory, and goes on to briefly describe the usefulness of digitized resources in research on the reception of composer Anton Bruckner's symphonies and music theorist Heinrich Schenker's early education. **Keywords:** digital scholarship, digital archives, digital library, open-access scholarship, music bibliography, music theory, Anton Bruckner, Johannes Brahm, Eduard Hanslick, Heinrich Schenker.

Beginning in the early 1900s, each successive generation witnessed significant cultural and sociological transformations linked to advances in technology. Consider the emergence and rapid growth of radio broadcasting on a broad scale in the 1920s, of television broadcasting in the 1950s, of commercial air travel in the 1920s, revolutionized by jet travel in the 1950s and 60s. From the late 1970s on, the most potent transformational force in all aspects of society, private, public, and professional, has clearly been the computer in both the personal and commercial domains. Computer technology in all of its dimensions has become utterly indispensable for business, government, and educational institutions. From the 1980s on, academic scholarship, too, has come to depend vitally on the ever increasing power and versatility of computers. Beginning in the early 1990s, even the revolutionary role of computers in society was itself revolutionized by the Internet. The advent of the World Wide Web has made massive repositories of digitized literature, ancient and modern, as well as searchable bibliographic databases readily available at the click of a mouse in libraries around the world, or even in the comfort of our homes. For those of us who learned and began practicing the craft of humanistic research before the age of computers and the World Wide Web, it is a scholar's dream come true.

The perspective offered here on this evolving scholarly cyberspace is that of a music theorist specializing in the intersection of intellectual history and thought about music over the centuries, with particular emphasis on writings of the eighteenth and nineteenth centuries. However, the tools and digital resources described herein are in some cases essential for research in other humanistic fields, and have counterparts, often in greater number, in non-humanistic fields (e.g. social and natural sciences).

The journey of scholarly research begins with searches in general reference works and in discipline-specific bibliographies, which lead to key primary and

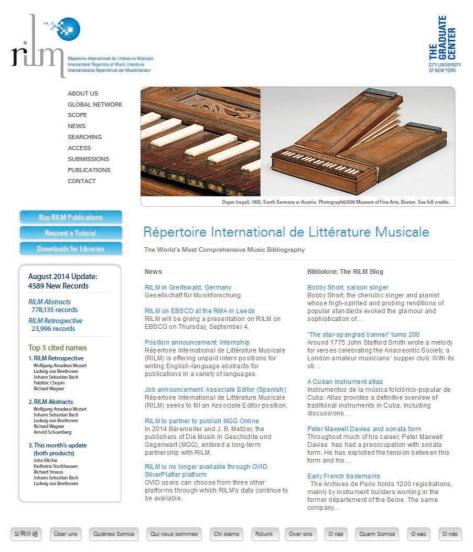


Figure 1. RILM Database website. Source: RILM International Repertory of Music Literature [online], 2014 [access: 2014-09-15]. Accessible at World Wide Web: http://www.rilm.org.

related secondary sources. In the field of music, the most widely used general reference in the English-speaking world is *Grove Music Online*¹.

Citations there lead to searches for secondary literature in the online bibliographic database known as RILM² and RIPM³, which focuses on eighteenth, nineteenth, and twentieth-century periodical literature on music. Both are available through individual and institutional subscription. Equipped with citations gleaned from those sources, the process continues with searches for primary and secondary literature in digitized form, when available.

For digitized secondary sources in music and many other fields, JSTOR⁴ offers a rich repository of digital texts that include, according to its website, "more than 2,000 academic journals, dating back to the first volume ever published, along with thousands of monographs and other materials". Here, all of the major journals in music scholarship are available electronically through institutional subscription. Access to digitized primary sources, particularly for literature from ancient times up through the nineteenth century, is often free of charge and available, in multiple editions and languages, through various Internet portals.

One of the best-known digital libraries of humanistic literature, covering a broad range of disciplines across many centuries, is the HathiTrust⁵, "a partnership of academic and research institutions, offering a collection of millions of titles digitized from libraries around the world". As an example, a search in the HathiTrust repository for works by and about the eminent nineteenth--century music journalist and aesthetician, Eduard Hanslick (1825-1904), yields links to texts of 7,594 items, including the full text of his celebrated treatise, Vom Musikalisch-schönen (1854), of his two-volume autobiography, and of book--length collections of his numerous concert and opera reviews. Other important collections of digitized texts in music, and in the humanities generally, include Zeno.org (2,432 books by 927 authors); Archive.org (over 6 million public--domain electronic books); and, of course, Google Books (books.google.com). In those digital libraries we find the full text of treatises by major eighteenth and nineteenth-century authors in music theory (for example, among others, Johann Mattheson, Jean-Philippe Rameau, Johann Philipp Kirnberger, Heinrich Christoph Koch, Moritz Hauptmann, and Simon Sechter).

Of special interest for music theory is the archive of electronic texts maintained by the Center for the History of Music Theory and Literature at Indiana

¹ Grove Music Online [online], 2014 [dostęp: 2014-09-15]. Dostępny w World Wide Web: http://www.oxford musiconline.com/.

² RILM International Repertory of Music Literaturę = Répertoire International de Littérature Musicale [online], 2014 [dostęp: 2014-09-15]. Dostępny w World Wide Web: http://www.rilm.org.

³ RIPM Retrospective Index to Music Periodicals = Répertoire International de la Presse Musicale [online], 2014 [dostęp: 2014-09-15]. Dostępny w World Wide Web: http://www.ripm.org.

⁴ JSTOR [online], 2014 [dostęp: 2014-09-15]. Dostępny w World Wide Web: http://www.jstor.org.

⁵ HathiTrust [online], 2014 [dostep: 2014-09-15]. Dostepny w World Wide Web: http://www.hathitrust.org.

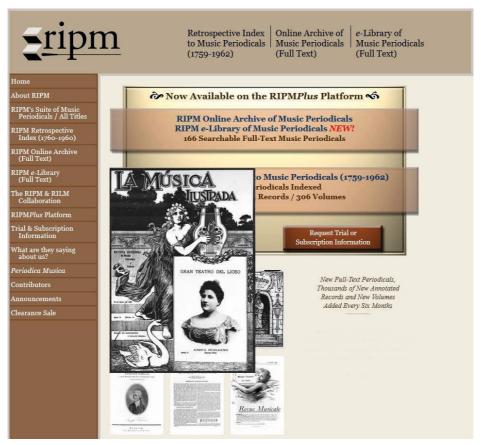


Figure 1. RIPM Database website. Source: RIPM Retrospective Index to Music Periodicals [online], 2014 [access: 2014-09-15]. Accessible at World Wide Web: http://www.ripm.org.

University⁶. Through their portal, we have access to three major collections, the Thesaurus Musicarum Latinarum⁷, which includes treatises in Latin dating from the Late Antiquity; saggi musicali italiani⁸, embracing major treatises in Italian; and the Traitesfrangaissur la musique⁹ focusing on major treatises in French. In those three collections, scholars have access to significant por-

⁶ Center for the History of Music Theory and Literature. In Indiana University [online], 2014 [dostęp: 2014-09-15]. Dostępny w World Wide Web: http://www.chmtl.indiana.edu.

⁷ *Thesaurus Musicarum Latinarum TML* [online], 2014 [dostęp: 2014-09-15]. Dostępny w World Wide Web: http://www.chmtl.indiana.edu/tml/index.html.

[§] Saggi musicali italiani [online], 2014 [dostęp: 2014-09-15]. Dostępny w World Wide Web: http://www.chmtl.indiana.edu/smi/index.html.

⁹ *Traités français sur la musique TFM* [online], 2014 [dostęp: 2104-09-15]. Dostępny w World Wide Web: http://www.chmtl.indiana.edu/tfm/index.html.

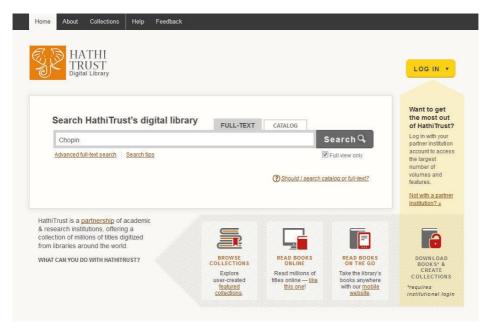


Figure 2. *HathiTrust Digital Library website*. *Source: HathiTrust* [online], 2014 [access: 2014-09-15]. Accessible at World Wide Web: http://www.hathitrust.org.

tions of music-theoretical literature of the past in Latin, Italian, and French, in its relation to "other arts and sciences which have influenced intellectual life from the medieval era to the present". A second important source of primary literature in music theory is located at the International Music Score Library/ Petrucci Music Library¹⁰. There, we find over 420 writings on music from the sixteenth through the twentieth century, from Gioseffo Zarlino (15171590) to Paul Hindemith (1895-1963), amid numerous other influential authors.

The above-mentioned digital collections are broadly conceived, encompassing works across many centuries and nationalities. By contrast, some archives are highly specialized in limiting themselves to a single, significant author. One such archive, still in progress, is devoted to Renaissance composer and music theorist Johannes Tinctoris (1435-1511), of the Netherlands¹¹. The site is intended to make available Tinctoris's major treatises, which were quite influential in the late fifteenth and sixteenth centuries, particularly regarding questions of compositional technique in works of three and more voices. The life and works of Ar-

¹⁰ International Music Score Library/Petrucci Music Library IMSLP [online], 2014 [dostęp: 2014-09-15]. Dostępny w World Wide Web: http://imslp.Org/wiki/Category:Music_theory.

¹¹ Johannes Tinctoris Complete Theoretical Works. In Early Music Theory [online], 2014 [dostęp: 2014-09-15]. Dostępny w World Wide Web: http://earlymusictheory.org/Tinctoris/.



Figure 3. Center for the History of Music Theory and Literature at Indiana University website. Source: Center for the History of Music Theory and Literature at Indiana University [online], 2014 [access: 2014-09-15]. Accessible at World Wide Web: http://www.chmtl.indiana.edu.



Figure 4. *Johannes Tinctoris's archive website*. Source: *Johannes Tinctoris Complete Theoretical Works. In Early Music Theory* [online], 2014 [access: 2014-09-15]. Accessible at World Wide Web: http://earlymusictheory.org/Tinctoris.



Figure 5. California Digital Library website. Source: California Digital Library [online], 2014 [access: 2014-09-15]. Accessible at World Wide Web: http://www.cdlib.org.

nold Schoenberg (18741951) are the subject of another such dedicated website¹². Of particular significance is the searchable database of selected writings¹³, which covers a broad range of topics¹⁴. Also available (as PDF files) are a complete catalog of Schoenberg's writings, and separate annotated lists of books and periodicals in his library. It is sites such as these, and others mentioned above, to which we music scholars have come to rely on so heavily for our primary and secondary-source study in preparing publications and public lectures. Enterprises such as the California Digital Library¹⁵, whose mission is to facilitate the "pursuit of scholarship and to extend the University's public service mission" are indispensable to modern-day scholarship. The CDL's mass digitization projects¹⁶ and others like them at other institutions constitute the foundation of future scholarly endeavors in all fields of research.

After addressing a number of general digital resources for humanistic academic research, I turn now to two of my own projects that involve readily available digital texts which I was able to study at my desk in Santa Barbara, California, instead of traveling thousands of miles to study printed texts in libraries in Poland and Austria. One of the projects deals with the lack of musical understanding of the symphonic works of the Austrian composer Anton Bruckner (1824-1896), as illustrated in published reviews of late nineteenth-century Viennese music critics, particularly those of Eduard Hanslick, mentioned earlier, but of several others as well (Gustav Dompke, Richard Heuberger, Max Kalbeck). The other project deals with the primary and secondary-school education of Viennese music theorist Heinrich Schenker (1868-1935) as a basis for understanding his later musical tastes, cultural identity, and political commitments.

The concert reviews of Hanslick and his critic colleagues in Vienna are published in a variety of that city's newspapers and journals. Were it not for digital texts, it would be necessary to spend time in the Austrian National Library, in Vienna, in order to locate and study the reviews. Fortunately, the digitization project known as ANNO¹⁷, the "virtual newspaper reading room of the Austri-

¹² Arnold Schönberg Center [online], 2014 [dostęp: 2014-09-15]. Dostępny w World Wide Web: http://www.ww.schoenberg.at/index.php?lang=en.

¹³ Writings. In Arnold Schönberg Center [online], 2014 [dostęp: 2014-09-15]. Dostępny w World Wide Web: http://www.ww.schoenberg.at/index.php?option=com_content&view=article&id=375&Itemid=338&lang=en.

¹⁴ According to the website, the categories include "pedagogical writings, literary and compositional models, commentaries, writings about music criticism, analysis, and theory, about philosophy, religion, Judaism, politics, and contemporary history; lectures, interviews, open letters, memoranda, notes, testimonials, and diaries."

¹⁵ California Digital Library CDL [online], 2014 [dostęp: 2014-09-15]. Dostępny w World Wide Web: http://www.cdlib.org.

¹⁶ UC Libraries Mass Digitization Projects. In California Digital Library CDL [online], 2014 [dostęp: 2014-09-15]. Dostępny w World Wide Web: http://www.cdlib.org/services/collections/massdig/faq.html.

¹⁷ ANNO - Austrian Newspapers Online [online], 2014 [dostep: 2014-09-15]. Dostepny w World Wide Web: http://anno.onb.ac.at.

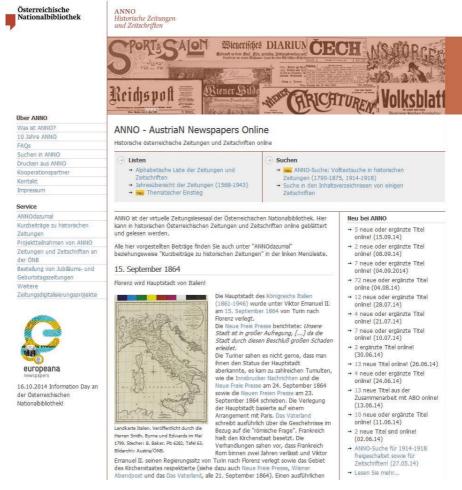


Figure 6. ANNO — AustriaN Newspapers Online website. Source: AustriaN Newspapers Online [online], 2014 [access: 2014-09-15]. Accessible at World Wide Web: http://anno.onb.ac.at.

an National Library", allows free electronic access to all of the major newspapers and journals of the late 1800s. As of August 2014, there are 12.5 million pages available for online reading. Full-text searches apply to three million pages (24%) published in 300,000 issues that appeared in the years 1700-1875 and 1914-1918. The ANNO website provides a link to an alphabetic listing of all represented periodicals, and provides for each a month-by-month, day-by-day display for each publication year. Consequently, it is possible almost instantly to access the exact issue and pages of a desired article. Through the computer interface, it is

possible, further, to enlarge the print of the digital images for easy reading, to download pages in PDF format, and to send pages by email.

With ANNO, I was able to locate and read, and in some cases print most of the major reviews by Hanslick and other critics of performances of Bruckner's symphonies, to compare the reviews, and to draw some conclusions about the different ways in which people heard and understood (more often misunderstood) the music. The study of the reviews contributes substantively to my broader study about the differences between the compositional techniques and structural characteristics of Bruckner's symphonies and those of Johannes Brahms (1833-1897), whose works were much more favorably received by Viennese critics and audiences. Bruckner's first successes came, notably, after performances outside of Austria, for example in Germany.

The second project for which I have relied extensively on digital texts available through the Internet is the study of Heinrich Schenker's secondary education (middle and high school) in the late 1870s and early 1880s in Lvov and Berezhany, located in what was at the time Galicia, after 1772 a province of the Austrian Empire, later (after 1867) a Crown Land of the Austro-Hungarian Empire. I learned from secondary sources that middle and high schools (Gymnasien) published annual reports, and that the reports contained information about the curriculum of each grade (fifth through twelfth), about themes of study during the year, about the student population (size, nationalities, ethnicities, religious association, and languages spoken), and about the faculty. Luckily — because I do not read or speak Polish — I came across the Polish title of an annual report of one of Schenker's schools, and used it in an Internet-wide search in hopes of locating the reports in libraries. My search led to the Pedagogical Digital Library¹⁸, to the Podkarpacka Digital Library¹⁹, and finally to the Digital Libraries Federation²⁰. I quickly discovered that almost all of the annual reports were available digitally, all fully searchable. With the help of Dorota Witczak, a key staff member and contact person at the Pedagogical Digital Library, I was able to locate digital copies of the remaining annual reports, including one which Schenker was not supposed to have attended but did because of special circumstances (building renovations). In the end, I was able to completely sketch out Schenker's secondary education, which included several hours of weekly instruction in Jewish religion about which no one had previously known. Without an archive of Internet-accessible digital texts such as the one maintained at the Pedagogical Digital Library, my work

¹⁸ Pedagogical Digital Library [online], 2014 [dostęp: 2014-09-15]. Dostępny w World Wide Web: http://pbc.up.krakow.pl/dlibra?action=ChangeLanguageAction&language=en.

¹⁹ Podkarpacka Digital Library [online], 2014 [dostęp: 2014-09-15]. Dostępny w World Wide Web: http://www.pbc.rzeszow.pl/index.php/en.

²⁰ Digital Libraries Federation [online], 2014 [dostep: 2014-09-15]. Dostepny w World Wide Web: http://www.fbc.pionier.net.pl/owoc?action=ChangeLanguageAction&language=en.

on this subject would have been far more difficult and time-consuming, not to mention expensive.

As exciting and as transformative as the above-mentioned resources have been in the academic world, they are but initial surges of a sustained series of mounting waves of digital resources currently in development and emerging on the horizon. Under the rubric "eScholarship", for example, the ten campuses of the University of California, have implemented policies of "open access" 21 for scholarly products produced by UC faculty, aimed at the open dissemination to the public of research for the benefit of society in its cultural and commercial spheres. Such scholarly production falls under the general heading of "scholarly communications"22. Other major universities have developed and implemented similar open-access policies on scholarly communications (Harvard, Princeton, and Columbia Universities, among numerous others). When fully developed, this open-access approach will make a broad range of scholarly research available on a worldwide scale, for instance monographs, journal articles, single-author essay collections, multi-author essay anthologies, and various categories of reference works (topical indexes, bibliographic databases, etc.). To find a comparable momentous event in the world of scholarly publishing, we would have to look back to Johannes Gutenberg's invention of mechanical movable type and the printing press in the fifteenth century. That revolution in the dissemination of knowledge has profoundly influenced and shaped society and the individual from Gutenberg's time right up to the present. Similarly, and perhaps even more profoundly, the digital revolution and scholarship in cyberspace will shape our intellectual and social world for centuries to come.

Biographical note:

Lee A. Rothfarb earned degrees at the Eastman School of Music (B.M., Composition, 1971), the Hartt School of Music (M.M., Theory, 1979), and at Yale University (Ph.D., Theory, 1985). Before joining the faculty at the University of California, Santa Barbara, in 1994, he taught at the University of Michigan, Tulane and Harvard Universities. His first book, *Ernst Kurth as Theorist and Analyst* (1988), won the Society for Music Theory's 1989 Outstanding Publication Award. A second book, *Ernst Kurth: Selected Writings*, appeared in 1991. *August Halm: A Critical and Creative Life in Music* was published in 2010. Rothfarb's essays have appeared in the *Journal of Music Theory*, 19- Century Music, Beethoven Forum, Indiana Theory Review, Theoria, Musiktheorie, Schweizer Jahrbuch für Musikwissenschaft, the yearbook of Musik in Baden-Württemberg, Festschrift for Patricia Car-

²¹ Office of Scholarly Communication. In University of California [online], 2014 [dostęp: 2014-09-15]. Dostępny w World Wide Web: http://osc.universityofcalifornia.edu/open-access-policy.

²² Scholarly Communication. In UCSanta Barbara Library [online], 2014 [dostęp: 2014-09-15]. Dostępny w World Wide Web: http://www.library.ucsb.edu/scholarly-communication?override_redirect=1.

penter, and in other essay anthologies. He is the founding editor of the Society for Music Theory's electronic journal, *Music Theory Online*. In 2013, the Society for Music Theory honored him with a Lifetime Membership. Rothfarb's current research deals with early music-analytical reception of Bruckner's symphonies, nineteenth-century aesthetics, and the impact of Heinrich Schenker's middle and high-school education on the formation of his mature cultural and political commitments.