

INTRODUCTION

DIGITAL LIBRARIES, PRESERVATION, AND METADATA

This issue of the *Journal* focuses on archiving and preservation of sound. The mission of the AES Technical Council's Technical Committee on Archiving, Restoration and Digital Libraries is to "address the problems of long-term storage of audio media and of the information contained therein." This task is interdisciplinary by nature. Those who are involved or are being recruited into this task speak many languages and possess diverse perspectives. Our "clients" are musicians, librarians, broadcasters, and niche-market collectors. Our colleagues range from chemists to material and computer scientists. Current "users" are individuals and groups from around the world; tomorrow's users we will leave to your imagination (see Bulger, Hart, Schüller).

We cannot lessen the complexities of this issue by asserting universal discovery or determination on the part of audio engineers. Just as Columbus "encountered" the Americas, we are encountering the existing cultures of ethnomusicologists, archivists, and multimedia librarians. Syntax has a way of determining perception. So, we have deliberately chosen the underrepresented voices of a musician (Hart), an ethnomusicologist (Bulger) and a computer scientist (Gladney, the "father of Digital Libraries"). We have sought to provide an overview on how those from different disciplines approach the challenges of preservation. This collection of articles speaks not only with our shared technical terms but also in the workaday language of an author's own discipline. Although audio has always been an interface activity, it has become even more imperative that audio engineers be fluent in a multiplicity of languages. It is clear that neither a librarian's nor engineer's idea of preservation is synonymous with a music producer's task of restoration (Fleming, Gladney, Hart, Hess). One Netizen's idea of access is another culture's taboo (Gladney).

A few weeks ago, scientists at Delft University of Technology in The Netherlands reported building a transistor from a single molecule one nanometer wide—about 1/10,000 the thickness of a human hair.¹ I won't indulge in any refined time-scale

speculation, but single-purpose nanotechnology devices will certainly be available in the foreseeable future. For example, a credit-card-size device could hold far more computer data than today's largest storage drives. Such a device might easily secure backup of all the multimedia records of a large library or media corporation. Nanomachines will eventually be part of music storage and retrieval systems. They will also probably redefine the boundaries between creation and perception of music as these tiny robots will be programmed to recognize or design musical patterns. Certainly, we will see them as sensors in both music production and signal analysis. So somewhere between now and then, we must figure out how to transfer, organize, and access our audio heritage. To paraphrase Cicero, our heritage ...is the witness that testifies to the passing of time; it illumines reality, vitalizes memory, provides guidance in daily life.²

Our musics communicate who we are. As audio engineers we must sustain the voices that formed us and open the paths for future voices to be heard.

This issue of the *Journal* examines:

- Experiences and solutions to carrier degradation (Hart, Hess).
- Metadata and information retrieval (Christel et al, Lindsay and Herre, Lyman, Weare and Tanner).
- Mass storage, data migration, and transfer systems (Fleming, Schüller).
- Restoration (Bulger, Hart, Herla et al, Hess).
- The digital library/archive (Herla et al, Gladney).

This issue is one of a series of initiatives begun over a year ago by the AES with input from a number of sources including the Technical Committee on Archiving, Restoration and Digital Libraries.

The 110th Convention in Amsterdam, 2001 May 12–15, included a number of key events on the topic, including workshops on Metadata and MPEG-7 Audio, and a special event discussing the AES31-3-1999 standard on the digital audio file

¹*Science*, 2001 July 6, pp. 76–79.

²Marcus Tullius Cicero, *Pro Publio Sestio*.

interchange format.³ In addition during the convention, the AES hosted a meeting conducted by DELOS (The European Communities Digital Library Effort),⁴ to which AES representatives were invited. Just two of the topics discussed at the meeting were: raising the awareness of harmonization potentials and diversity of metadata in different fields of audio applications (broadcasters, music and multimedia industry, sound archives, national and public libraries, electronic publishing services and so forth); and considering scenarios of access to "essence" by means of metadata via the Internet.

Other AES scheduled upcoming events include a workshop on Metadata at the 111th Convention in New York, 2001 September 21–24. Among the subjects up for discussion are

- MPEG-7 (see Lindsay and Herre)
- MPEG-21⁵
- AAF⁶
- AES31.

The AES 20th International Conference on Archiving and Restoration will be held in Budapest, Hungary, 2001 October 5–7. The conference program illustrates the rapid response of AES members to meet the calls of librarians and archivists (see Bulger). Among the many scheduled topics are

- Broadcast archives development
- Restoration
- Optical media carrier degradation.

The existing and ongoing AES standards efforts related to digital libraries are covered in this issue's Standards and Information Documents under *Standards and Standards Committee Projects Related to Digital Libraries*.

In addition, a resource list on this topic will be

posted on the website of the Technical Committee on Archiving, Restoration and Digital Libraries, at www.aes.org/technical/ard/.

In other areas, UNESCO (United Nations Education and Cultural Organization) has just drafted a resolution to insure that the preservation of our digital heritage be given high priority at national policy levels and that the infrastructure and procedures are in place to preserve our digital heritage and to support national memory organizations, such as national libraries and national archives. The full text of this draft can be found on the Technical Committee website.

Success in archiving, restoration, and in developing digital libraries will depend on learning to both speak and understand many languages. As guest editor, I share the philosophy of some of our authors (Bulger, Hart) that distribution is a technique of preservation. I hope this issue of the *Journal* is a step forward not only in distributing what we know but also in highlighting how far we have to go in building user-friendly digital libraries.

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Chair, Workshop 5:

Digital Libraries, Preservation, and Metadata
AES 109th Convention Los Angeles, CA
2000 September 22–25

and

Cochair, AES Technical Committee on
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³AES31-3-1999 AES standard for network and file transfer of audio — Audio-file transfer and exchange — Part 3: Simple project interchange.

⁴DELOS objectives are (i) to stimulate research activities in areas that are relevant for the efficient and cost-effective development of digital library systems, (ii) to encourage collaboration between research teams working in the field of digital libraries and (iii) to establish links with on-going projects and activities in the field of digital libraries in industry and other public and private institutions. [http://](http://www.ercim.org/publication/ws-proceedings/DELOS1/index.html)

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⁵The vision for MPEG-21 is to define a multimedia framework to enable transparent and augmented use of multimedia resources across a wide range of networks and devices used by different communities.

⁶The Advanced Authoring Format (AAF) is a multimedia file format that enables content creators to easily exchange digital media and metadata across platforms, and between systems and applications. <http://www.aafassociation.org/>

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