SI 678 - Preserving Sound and Motion, Winter 2010

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SI 678 Preserving Sound and Motion

Class 2 – Media and the Environment
Themes

- Media degradation - theory
- Magnetic tape issues
- Motion picture film issues
- Storing tape and film - standards
- Care and handling - guidelines
Media Degradation

- Common media have organic elements
- Some, but not all media behave predictably
- Autocatalytic reactions speed loss
- Very wide variation in manufacturing quality
- History of care and handling is a crucial factor

IPI Media Storage.
http://www.imagepermanenceinstitute.org/shtml_sub/msqr.pdf

Dead Media Project: http://www.deadmedia.org/

Magnetic Tape

- Magnetic tape behavior is erratic.
- Binder is the culprit (sticky shed)
- Simple diagnostic tool is elusive.
- Preserving the medium may not be feasible.

Recommendations

- Improve storage environments
- Develop automated tape transfer
- Prioritize transfer based on format obsolescence

Preservation of Magnetic Tape Collections. 2006.
Motion Picture Film

- Nitrate, acetate, polyester each exhibit different properties
- Color is a particular challenge
- Sound is a particular challenge
- Playback equipment
- Artifact value of film may be significant

http://www.filmpreservation.org/preservation/film_guide.html
Nitrate Film Fires – Early Ones

A list of 76 film-related fires, 1896 - 1993

- 1896: Acres Kineopticon, London UK.
- 1896: Edison Pavilion, Berlin Germany
- 1897: Bazar de la Charite, Paris France
- 1898: Market Place, Bilston UK
- 1898: Salao de Novidades, Rio de Janeiro Brazil
- 1907: Town Hall, Suffolk UK
- 1907: Hepworth Film Studios, Walton-on-Thames UK

Media degradation
Magnetic tape
Motion picture film
Storage guidelines
Care and handling
Snippet

• This Film Is Dangerous. 2002
Nitrate Film Fires – Big Ones

- 1914: Edison Factory, West Orange NJ
- 1927: Cleveland Clinic, Cleveland OH
- 1929: Consolidated Film Industries, Hollywood CA
- 1934: Warner Bros. Studio, Burbank CA
- 1941: Stockholm Sweden
- 1943: Harold Lloyd Residence, Beverly Hills CA
- 1967: National Film Board Archives, Canada
- 1978: George Eastman House, Rochester NY
- 1978: National Archives, Suitland MD
- 1988: Bundesarchiv, Koblenz Germany
- 1993: Hendersons Laboratories, South Norwood UK

Media degradation
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This Film Is Dangerous. 2002
### Potential Value of Storage

#### Media degradation
- Magnetic tape
- Motion picture film

#### Storage guidelines
- Care and handling

#### Snippet

**Table IV.** Comparison of five models of chemical decay.

<table>
<thead>
<tr>
<th>Model/Material</th>
<th>70°F 80% RH</th>
<th>70°F 50% RH</th>
<th>70°F 20% RH</th>
<th>50°F 50% RH</th>
<th>30°F 50% RH</th>
</tr>
</thead>
<tbody>
<tr>
<td>IPI/Acetate Film</td>
<td>17</td>
<td>38</td>
<td>87</td>
<td>158</td>
<td>731</td>
</tr>
<tr>
<td>Isoperm*/Paper</td>
<td>26</td>
<td>41</td>
<td>92</td>
<td>220</td>
<td>1540</td>
</tr>
<tr>
<td>NML/VHS Tape</td>
<td>6</td>
<td>32</td>
<td>&gt;64</td>
<td>&gt;&gt;64</td>
<td>&gt;&gt;64</td>
</tr>
<tr>
<td>NYS-IPI/Color Dyes</td>
<td>18</td>
<td>38</td>
<td>182</td>
<td>169</td>
<td>843</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td><strong>17</strong></td>
<td><strong>37</strong></td>
<td><strong>106</strong></td>
<td><strong>182</strong></td>
<td><strong>1038</strong></td>
</tr>
</tbody>
</table>

*Using 25 kcal/mole, normalized to 44 years at 68°F, 50% RH.

Storage Guidelines

- **Film**
  - Freeze nitrate
  - Cool acetate
  - Cool polyester

- **Magnetic tape**
  - Distinguish archive from use copy
  - Cool archival version
  - Room temp for use copy

- **CDs and DVDs at room temp**

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*Magnetic tape*  
*Motion picture film*  
*Storage guidelines*  
*Care and handling*  
*Snippet*

- Reilly (1993) and Byers (2003)
Care and Handling Guidelines

- Environmental control is first line of defense
- Appropriate and clean playback equipment is essential
- Pickett and Lemcoe (1959) study deals with historical formats of sound recordings.
- Byers (2003) study covers CDs and DVDs
Testing Standards

- Storage and care should be based on a foundation of testing standards
- Lack of uniformity is the rule
- Predictions of EoL drive testing
- Defining EoL is controversial
- Optical Disc Tests as an example

Thank you!

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