

Just keep the bits: an introduction to bit level preservation



Digital**Preservation**Coalition

Just keep the bits...



What are the risks? (1)

- Media obsolescence
- Media failure or decay (such as “bit rot”)
- Natural / human-made disaster



What is the result?

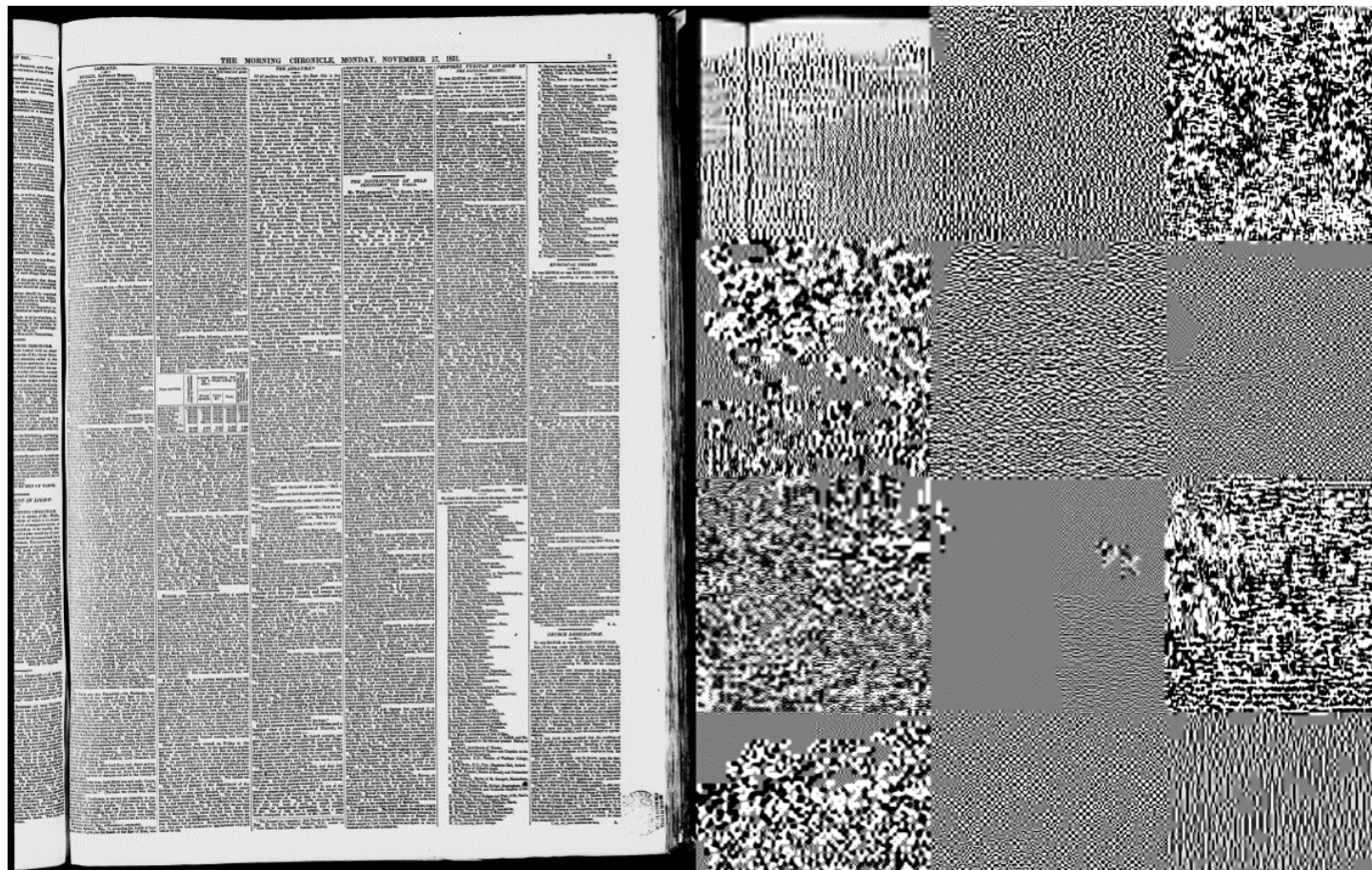
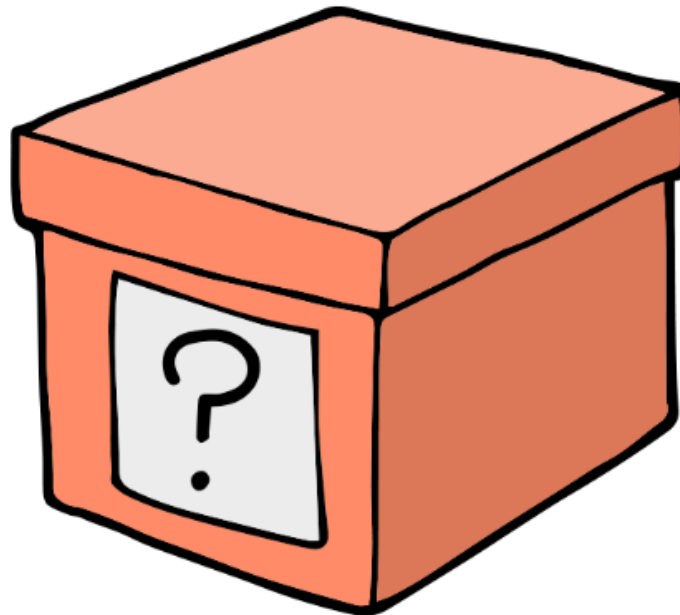


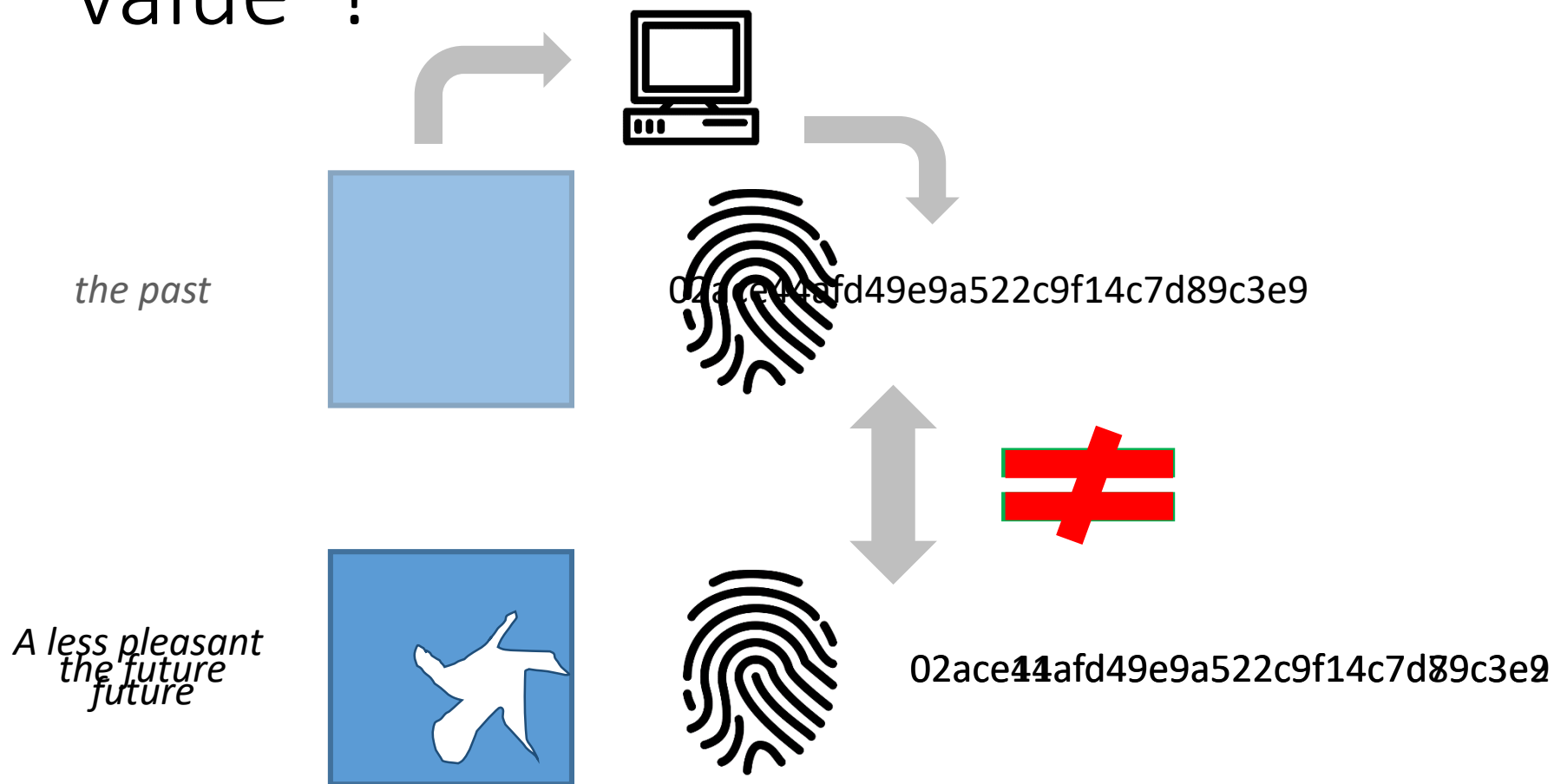
Image courtesy of the British Library

How do we solve these problems?

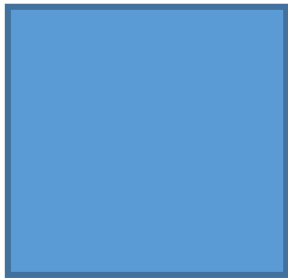
- As a minimum:
 - Keep more than one copy
 - Refresh storage media
 - Integrity check your data (also called “Fixity”)



What is a “checksum” or “hash value”?



Combined strategies: keep 3 copies and perform integrity checks



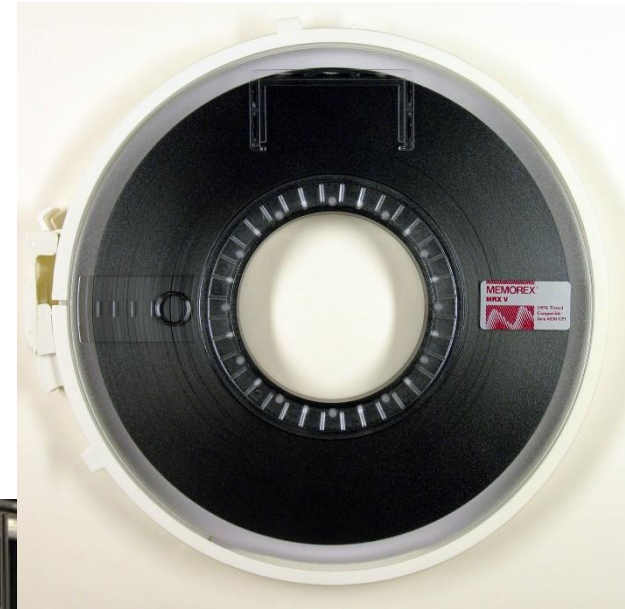
Integrity checking - tools

- Fixity
 - <https://www.avpreserve.com/tools/fixity/>
- Auditing Control Environment (ACE)
 - <https://wiki.umiacs.umd.edu/adapt/index.php/Ace>
- For alternatives – see COPTR
 - <http://coptr.digipres.org/Category:Fixity>

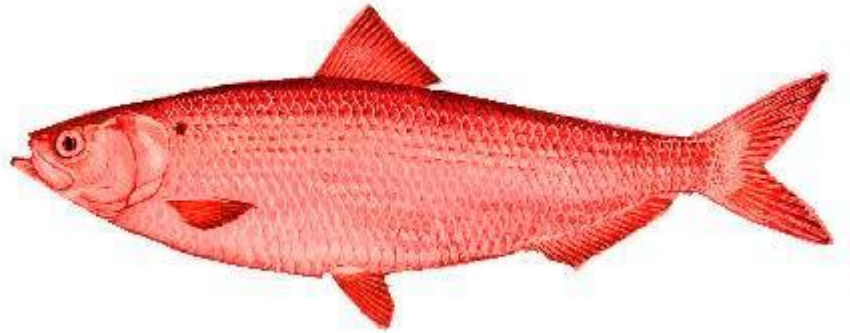


Data storage – some options

- Hard disk, magnetic tape or optical disc
- Consumer hand held media
- Managed storage
- Cloud



Long lived media: a red herring



“...announcements of very long-lived media
have made no practical difference to large-scale
digital preservation...”

David Rosenthal, Stanford University Library

<http://blog.dshr.org/2013/07/immortal-media.html>

What are the risks? (2)

- Common mode failure (technology)
- Human error and malicious damage



Recap

- Keep several copies of all your files
- Keep one copy in a different geographical location
- Don't use the same storage technologies for each copy and don't rely on a single vendor to store all your data
- Create checksums
- Perform periodic integrity checks
- Avoid having any one person with write access to all copies of data
- Ultimately – you need a digital repository that manages all this for you (and more!)

Further information

- Digital Preservation Handbook
 - <http://www.dpconline.org/advice/preservationhandbook>
- David Rosenthal's blog
 - <http://blog.dshr.org>
- AVPreserve cloud storage profiles
 - <https://www.avpreserve.com/papers-and-presentations/cloud-storage-vendor-profiles>
- Cloudy Culture' blog posts on cloud storage
 - <http://dpconline.org/component/comprofile/userprofile/767-leehibberd?tab=10>