

# BatLit.org - Mobilizing Bat Literature

through existing Collaborations, platforms, and open source tools

Jorrit Poelen (UC Santa Barbara Cheadle Center, Ronin Institute)   Aja C. Sherman  
(Bat Eco-Interactions Project)   Anna Willoughby (University of Georgia, Athens,  
GA, US)   Donat Agosti (Plazi)   Nancy B. Simmons (American Museum of  
Natural History)   Nathan S. Upham (Arizona State University)   Cullen Geiselman  
(Bat Eco-Interactions Project)

2024-10-25

## Guiding Questions

*How do you access/reuse literature collection?*

*How do you organize your literature collection?*

*How do you share your literature collection?*



**Jorrit Poelen (GloBI)** Wednesday at 4:17 PM

@Cullen Geiselman @Aja Sherman @Nancy Simmons  
@Ariadna Morales @Kendra Phelps @DeeAnn M. Reeder  
@Hernani Fernandes Magalhães de Oliveira  
@Cecilia Montauban @Nancy Simmons et al. Any recommendations for the top-5 influential/inspirational bat papers published before 2000 ? (edited)

12 replies

---



**Jelle Zijlstra** Wednesday at 4:19 PM

Andersen, K.C. 1912. Catalogue of the Chiroptera in the collection of the British Museum. Volume I: Megachiroptera. British Museum (Natural History), British Museum Catalogue, 854 pp. <https://www.biodiversitylibrary.org/part/91323>.



## Andersen, 1912: An Influential Bat Work

Andersen, K.C. 1912. Catalogue of the Chiroptera in the collection of the British Museum. Volume I: Megachiroptera. British Museum (Natural History), British Museum Catalogue, 854 pp. <https://www.biodiversitylibrary.org/part/91323>.

# Finding Andersen, 1912

The screenshot shows the Biodiversity Heritage Library (BHL) website. At the top, there is a banner with the text: "Internet Archive is currently down. As a result, page images are not displaying in BHL. For the latest updates, follow [@internetarchive](#)". Below this, the BHL logo is displayed, along with links for "About", "Help", "FAQ", and "Feedback". Social media icons for Facebook, Twitter, and others are also present. A navigation bar allows users to "Browse by" Title, Author, Date, Collection, or Contributor. A search bar is available for "Full-text" and "Catalog" searches. The main content area displays the title of the book: "Book: Catalogue of the Chiroptera In the collection of the British Museum. Volume I: Megachiroptera". On the left, detailed information about the book is provided: Title (Catalogue of the Chiroptera In the collection of the British Museum. Volume I: Megachiroptera), By (Andersen, Knud, 1867-1918), and Type (Book). On the right, there are buttons for "Cite This Publication", "View Book", and "Download" (PDF).

Please read BHL's [Acknowledgment of Harmful Content](#)

Internet Archive is currently down. As a result, page images are not displaying in BHL.  
For the latest updates, follow [@internetarchive](#)

Browse by:

Full-text Catalog [?](#) [ADVANCED SEARCH](#)

Search the catalog and full-text  [🔍](#)

Book: Catalogue of the Chiroptera In the collection of the British Museum. Volume I: Megachiroptera [⚠](#)

Title  
Catalogue of the Chiroptera In the collection of the British Museum. Volume I:  
Megachiroptera

By  
[Andersen, Knud, 1867-1918](#)

Type  
Book

Cite This Publication

Book access

[View Book](#)

Copyright & Usage:  
Copyright Status: Public domain. The BHL considers  
that this work is no longer under copyright protection.

Download: [PDF](#)

Figure 1: Internet Archive Down Banner on Biodiversity Heritage Library. Accessed at <https://www.biodiversitylibrary.org/part/91323> on 2024-10-16.

# Finding Andersen, 1912

○ 🔍 <https://biostor.org/reference/126601>

---

---

[Home](#)

## Catalogue of the Chiroptera In the collection of the British Museum. Volume I: Megachiroptera

[Knud Andersen](#)

in 1912, pages 1-854

Date published: 1912

DOI: [10.5962/bhl.title.8322](https://doi.org/10.5962/bhl.title.8322) BHL: [8409391](https://biodiversitylibrary.org/page/8409391) PDF: [View](#)

### Page images



.....

.....

.....

Figure 2: Andersen 1912 as seen at <https://biostor.org/reference/126601> on 2024-10-22.

# Finding Andersen, 1912

Like this?



Figure 3: AMNH Department of Mammalogy Library. 2024-10-03. Photo by Nancy Simmons

# Finding Anderson, 1912

Or, like this?

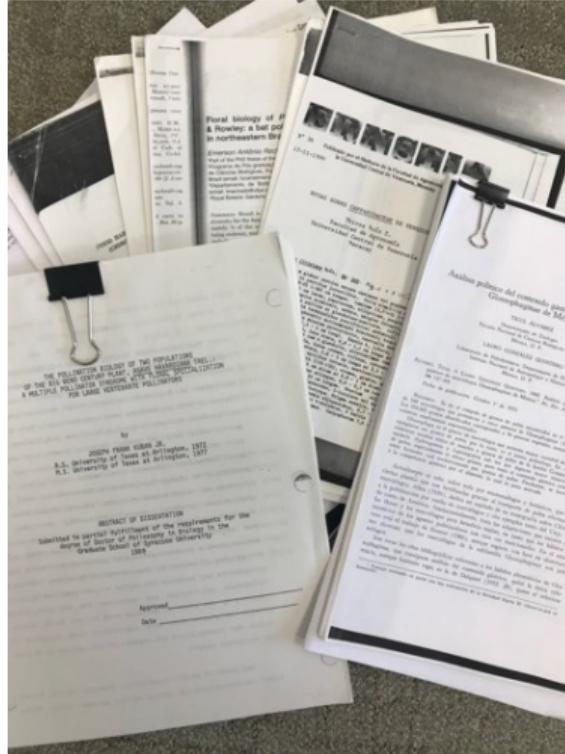


Figure 4: Bat Papers on Cullen's Desk. 2024-10-03. Photo by Cullen Geiselman

Finding Anderson, 1912

Or perhaps like this?



Figure 5: Pile of Paper in Nancy's Office. 2024-10-03. Photo By Nancy Simmons

# Finding Anderson, 1912

The screenshot shows a Zotero library interface. On the left, there's a sidebar with 'My Library' and several group libraries listed under 'Group Libraries': 'Bat Literature Project' (selected), 'BLR', 'Trash', 'chiroptera-hesperomys-test', 'Darwincore Github', 'Plazi Coronavirus Virus-Hosts Li...', 'preston', and 'Sudo Mesh'. Below the sidebar is a list of tags: ??-Glucan, \*229-E-like bat coronavirus, \*adenovirus, \*Africa, \*Alphacoronavirus, \*Angolan free-tailed bat, \*Angolan free-tailed bats, \*animal capture, \*animal care, \*Animal Distribution, \*animal housing, \*animal marking, and a 'Filter Tags' input field.

The main area displays a list of items. The first item is the one being viewed:

Title	Creator
Catalogue of Chiroptera in the collection of the Zoolog... Ghosh	
Catalogue of mammalia in the collection of the Zoolog... Talmale	
Catalogue of Mammalian exhibits of Zoological Galleri... Chakraborty	
Catalogue of mammals collected by E. Heller in South... Elliot	
Catalogue of primary types of Neotropical Myotis (Chir... Novaes et al.	
Catalogue of the Chiroptera in the collection of the ... Andersen et al.	
Catalogue of the mammals of Ethiopia and Eritrea. 7. ... Yalden et al.	
CATALOGUE OF THE MAMMALS OF ETHIOPIA: 1. ... Lærgen et al.	
Catalogue of type specimens of neotropical bats in sel... Carter and Dolan	

Below the list is a detailed view of the selected item:

Item Type	Book
Title	Catalogue of the Chiroptera in the collection of the ... Museum / By G.E. Dobson.
Author	Andersen, Knud.
Author	British Museum (Natural History).
Author	Dobson, George Edward.
Place	London,
Publisher	[s.n.]
Date	1912
URL	<a href="http://www.biodiversitylibrary.org/bibliograph...">http://www.biodiversitylibrary.org/bibliograph...</a>
Accessed	11/9/2023, 10:22:16 AM

Figure 6: Members only Zotero record in the Bat Literature Project as accessed at [https://www.zotero.org/groups/5435545/bat\\_literature\\_project/items/P825HKF3](https://www.zotero.org/groups/5435545/bat_literature_project/items/P825HKF3) on 2024-10-22

# Finding Andersen, 1912

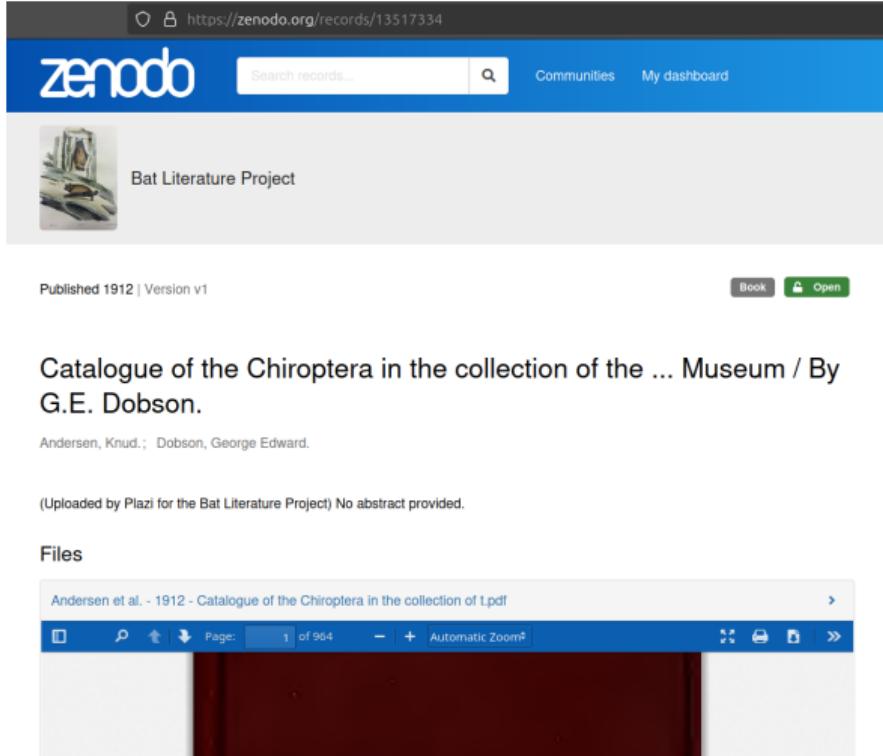


Figure 7: Digital Copy of Andersen 1912 as seen at <https://zenodo.org/records/13517334> on 2024-10-22

# Finding Andersen, 1912

The screenshot shows a Zenodo record page for a digital copy of Andersen's 1912 work. At the top, there is a navigation bar with a magnifying glass icon, a file icon, the URL <https://zenodo.org/records/13517334>, and a search bar with a star icon.

**Additional details**

---

Identifiers	<b>URL</b> <a href="https://md5/56384a6778e2c67bbd8ebe4d63f770cf">hash://md5/56384a6778e2c67bbd8ebe4d63f770cf</a>
	<b>URN</b> <a href="urn:isbn:zotero.org:groups:5435545:items:P825Hkf3">urn:isbn:zotero.org:groups:5435545:items:P825Hkf3</a>

---

▶ Related works	<b>Has version</b> <a href="https://md5/56384a6778e2c67bbd8ebe4d63f770cf">hash://md5/56384a6778e2c67bbd8ebe4d63f770cf</a> (URL) <a href="https://sha256/a38352c608bafdb87cd6d77211dadffa460c0f7978ae5ed3fa38f9ba4d16836c">hash://sha256/a38352c608bafdb87cd6d77211dadffa460c0f7978ae5ed3fa38f9ba4d16836c</a> (URL)
	<b>Is compiled by</b> Software: <a href="https://doi.org/10.5281/zenodo.1410543">10.5281/zenodo.1410543</a> (DOI)
	<b>Is derived from</b> <a href="https://zotero.org/select/groups/5435545/items/P825Hkf3">zotero://select/groups/5435545/items/P825Hkf3</a> (URL) <a href="https://zotero.org/groups/5435545/items/P825Hkf3">https://zotero.org/groups/5435545/items/P825Hkf3</a> (URL) <a href="https://linker.bio/cut:hash://md5/5b5b42413228fe3497802a6b8600efe3/b39507-41976">https://linker.bio/cut:hash://md5/5b5b42413228fe3497802a6b8600efe3/b39507-41976</a> (URL)
	<b>Is part of</b> <a href="https://md5/26f7ce5dd404e33c6570edd4ba250d20">hash://md5/26f7ce5dd404e33c6570edd4ba250d20</a> (URL)

---

▶ Biodiversity	<b>Class</b> <a href="#">Mammalia</a>
----------------	--

Figure 8: Identifiers associated with Digital Copy of Anderson 1912 as seen at <https://zenodo.org/records/13517334> on 2024-10-22

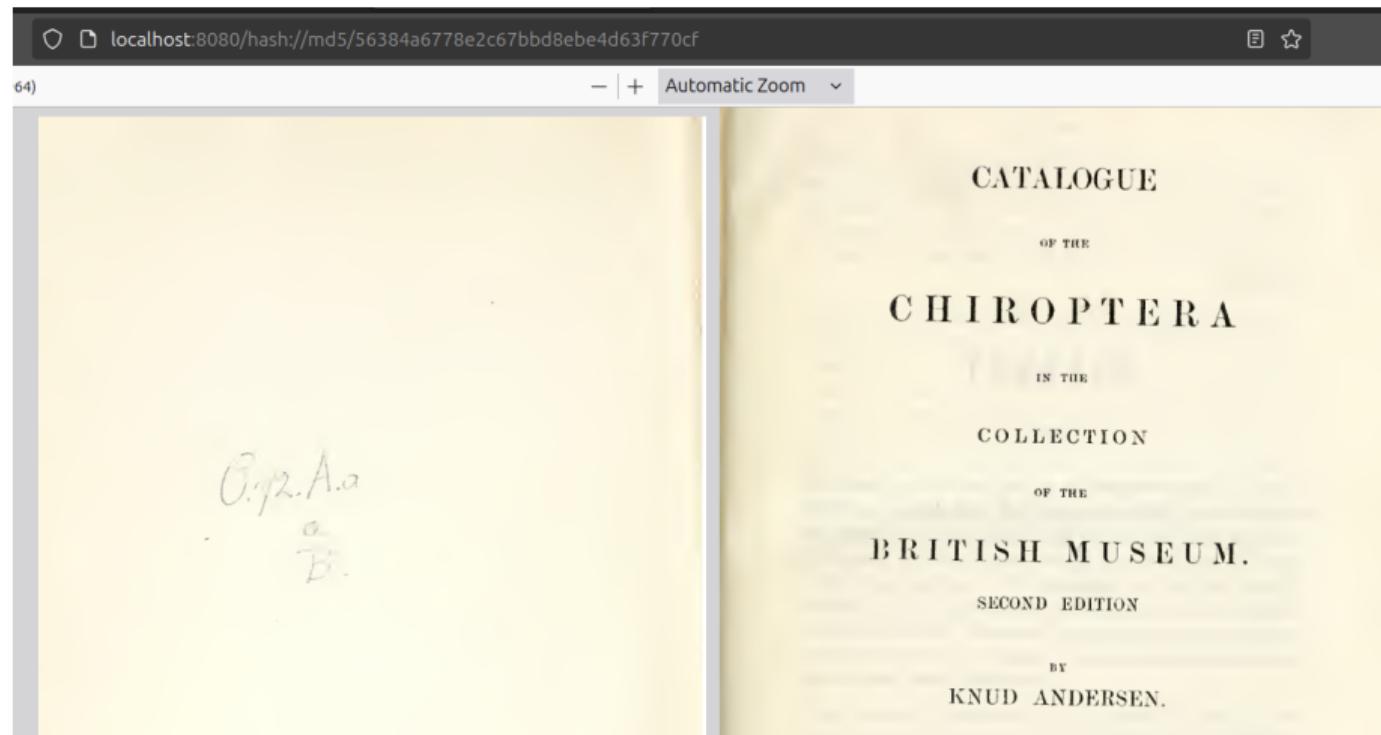
## Finding Anderson, 1912

So, some webpage

- ... at <https://zenodo.org/records/13517334> ...
- ... as accessed on 2024-10-22
- ... claims that Anderson, 1912
- ... is associated with a digital fingerprint
- ... <hash://md5/56384a6778e2c67bbd8ebe4d63f770cf>
- ... that uniquely identifies a “physical” digital copy
- ... of the seminal Andersen, 1912 work.

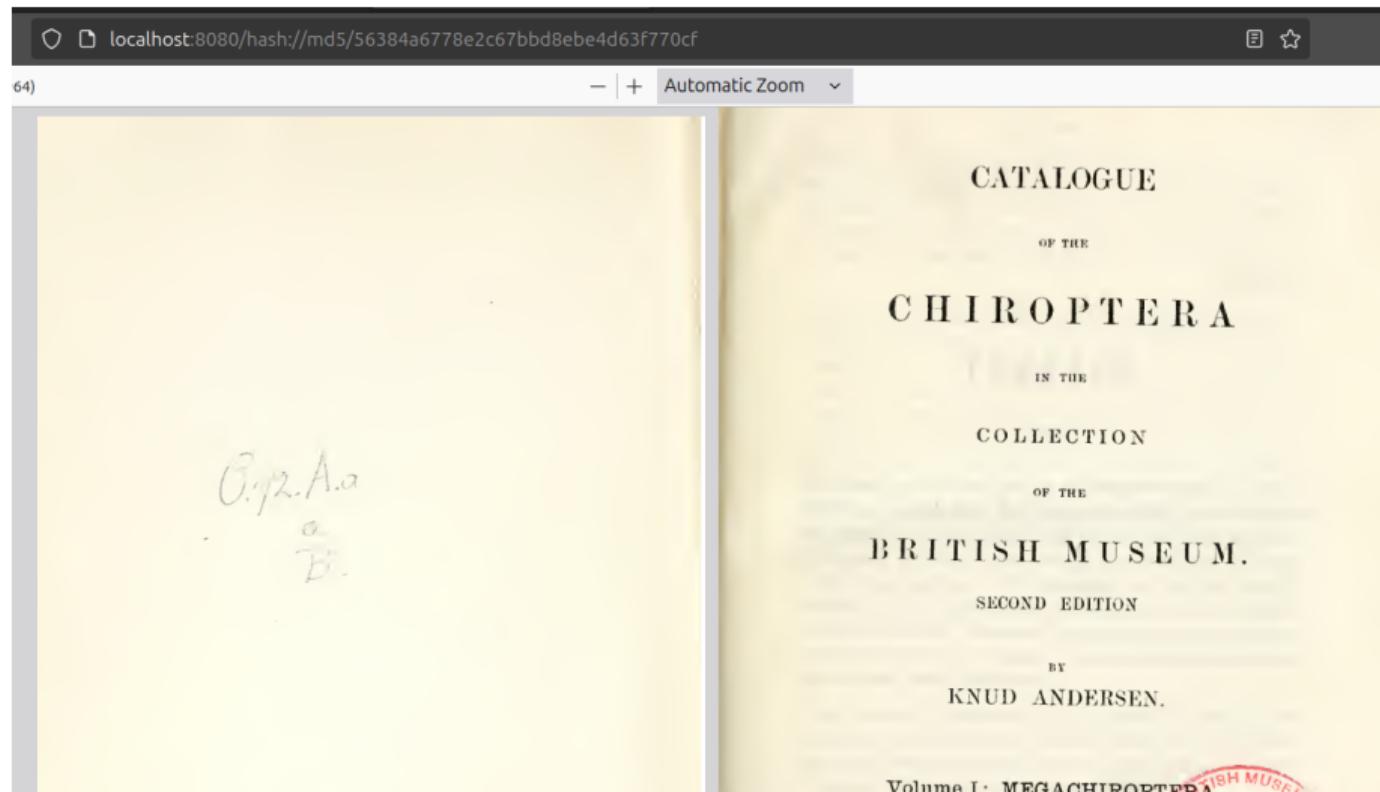
# Found Andersen, 1912 at 30,000 ft

(screenshot made of Jorrit's laptop screen at 30,000 ft on UA6135 IAH to GDL on 2024-10-22 using: Sherman, A.C. et al 2024. BatLit.org v0.6  
hash://md5/db73e659e8cf16ef50e82bb5e72ae97b)



# Found Andersen, 1912!

Note to self: next time, add a **digital content fingerprint** to identify the exact digital copy of Anderson, 1912 you'd like to reference.



## Citing Andersen, 1912 pre-Internet

Andersen, K.C. 1912. Catalogue of the Chiroptera in the collection of the British Museum. Volume I: Megachiroptera. British Museum (Natural History), British Museum Catalogue, 854 pp.

## Citing Andersen, 1912 in the Age of the Internet

(with internet locations)

Andersen, K.C. 1912. Catalogue of the Chiroptera in the collection of the British Museum. Volume I: Megachiroptera. British Museum (Natural History), British Museum Catalogue, 854 pp. <https://www.biodiversitylibrary.org/part/91323>  
<https://doi.org/10.5962/bhl.title.8322>

## Citing Andersen, 1912: Beyond the Internet

(with internet locations and non-internet identifiers)

Andersen, K.C. 1912. Catalogue of the Chiroptera in the collection of the British Museum. Volume I: Megachiroptera. British Museum (Natural History), British Museum Catalogue, 854 pp. <https://www.biodiversitylibrary.org/part/91323>  
<https://doi.org/10.5962/bhl.title.8322>  
**hash://md5/56384a6778e2c67bbd8ebe4d63f770cf** <sup>1</sup>

---

<sup>1</sup>Elliott M.J., Poelen, J.H. & Fortes, J.A.B. (2023) Signing data citations enables data verification and citation persistence. *Sci Data*. <https://doi.org/10.1038/s41597-023-02230-y>  
hash://sha256/f849c870565f608899f183ca261365dce9c9f1c5441b1c779e0db49df9c2a19d

## How Was Jorrit Able to Access This Paper at 30,000 ft?



Figure 9: Jorrit bought a 128GB SD Card for ~\$25 USD at the Target on 2500 E Lake St, Minneapolis, Minnesota before NASBR 2024

## How Was Jorrit Able to Access This Paper at 30,000 ft?



Figure 10: Jorrit copying BatLit v0.6 hash://md5/db73e659e8cf16ef50e82bb5e72ae97b on 2024-10-21

## How Was Jorrit Able to Access This Paper at 30,000 ft?

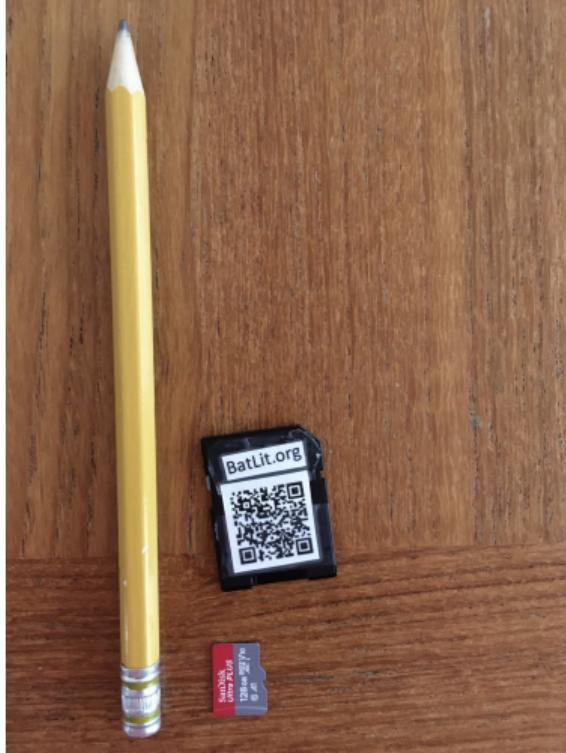


Figure 11: SD Card carrying > 400k pages of bat literature contained in BatLit v0.6  
[hash://md5/db73e659e8cf16ef50e82bb5e72ae97b](https://md5/db73e659e8cf16ef50e82bb5e72ae97b) on 2024-10-21

Wishing you had 20k bat papers at your fingertips?



Figure 12: Cecilia Montauban catching bats in Ghana while writing a Bat Conservation International student scholarship application Ghana in October 2021

## BatLit Bits and Pieces

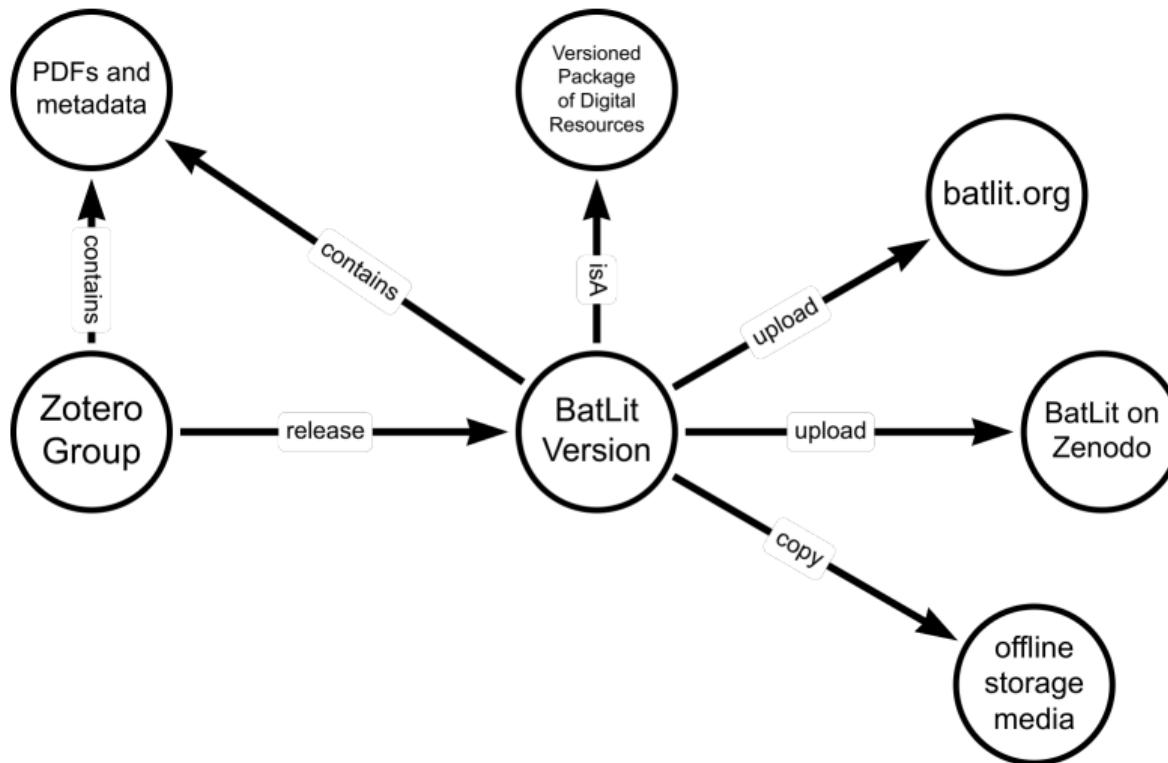


Figure 13: Zotero is used for managing a collection of literature references. Versioned snapshots of this collection are securely packaged in a BatLit version. This version is then mobilized using a website, the Zenodo batlit community, and on offline storage media.

## BatLit Versions

version	date	size	# pages	# references	fingerprint
v0.6	2024-09-19	44.7GiB	427,105	<b>19,038</b>	
v0.5	2024-08-16	50.9 GiB		20,145	
...	...	...	...	...	
v0.1	2024-04-26	7.9 GiB		2,929	

## How Was Jorrit Able to Access Andersen, 1912?

Through Work of CETAf/GBatNet Eco-Interactions working group activities spanning 4.5 years in which:

- ▶ goals were identified
  - ▶ (G1) make bat interaction data digitally accessible,
  - ▶ (G2) align bat taxonomic names to uncover their meaning, and
  - ▶ (G3) provide open-access to bat literature.
- ▶ Plazi provided a legal framework via their Biodiversity Literature Repository <sup>2</sup>.
- ▶ BatBase <sup>3</sup> provided curatorial support.
- ▶ Jorrit reused open source software <sup>4</sup> to track, package and version bat literature metadata and their pdfs.
- ▶ Researchers like you shared their literature collections.

---

<sup>2</sup><https://plazi.org>, <https://zenodo.org/communities/biosyslit/records>

<sup>3</sup>Bat Eco-Interactions Project, <https://batbase.org>

<sup>4</sup><https://github.com/bio-guoda/preston>

## Next Steps

Further develop governance model to help sustain BatLit.

Improve BatLit depth, mobility, and access for the benefit of the bat research community.

Use BatLit as a digital foundation for associated projects.

## Want to know more?

Visit <https://batlit.org>, or chat/reach out to members of the GBatNet Eco-Interactions working group (in no particular order):

Aja Sherman, Nancy Simmons, DeeAnn Reeder, Nathan Upham, Cullen Geiselman, Cecilia Montauban, Hernani Oliveira, Ariadna Morales, Jelle Zijlstra, Quentin Groom, Donat Agosti, Kendra Phelps, Anna Willoughby, or Jorrit Poelen.

## Thank you / Acknowledgments

BatLit would not have been possible without the tremendous amount of work done by you, your fellow bat researchers, and those that proceeded us.

## Guiding Questions

*How do you access/reuse literature collection?*

*How do you organize your literature collection?*

*How do you share your literature collection?*

Extra

## BatLit Workflow

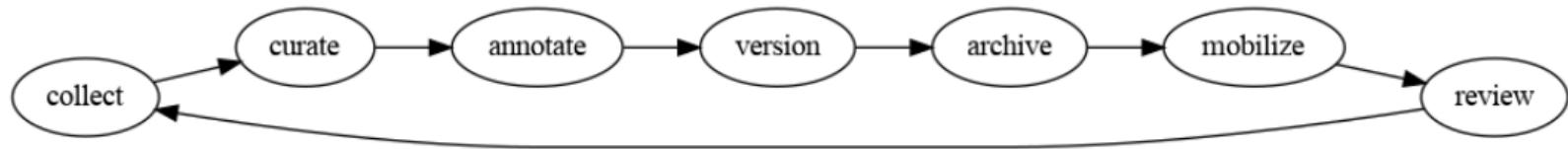


Figure 14: BatLit Workflow

## BatLit Workflow Steps

1. Curator Adds Digital Copy to BatLit Project on Zotero<sup>5</sup>
2. Periodically, Archivist takes a snapshot of all Zotero records in BatLit, including bibliographic metadata and the “physical” digital copy (pdf).
3. Archivist puts the snapshots in a signed digital archive (box) and signs the provenance logs
4. Signed Digital Archive (or a batlit corpus version) is mobilized by translating and upload them to Zenodo, GitHub Pages, and various other network attached storage media
5. Signed Digital Archives is stored on offline enabled media (sd card, external hard disk)
6. Corpus is transmitted and discovered by students researchers
7. Corpus is reused by students and researchers, enabling both manual (e.g., reading, annotation) and automated (e.g., raw material for language model training) workflows
8. Reuse promotes improvement and further awareness

---

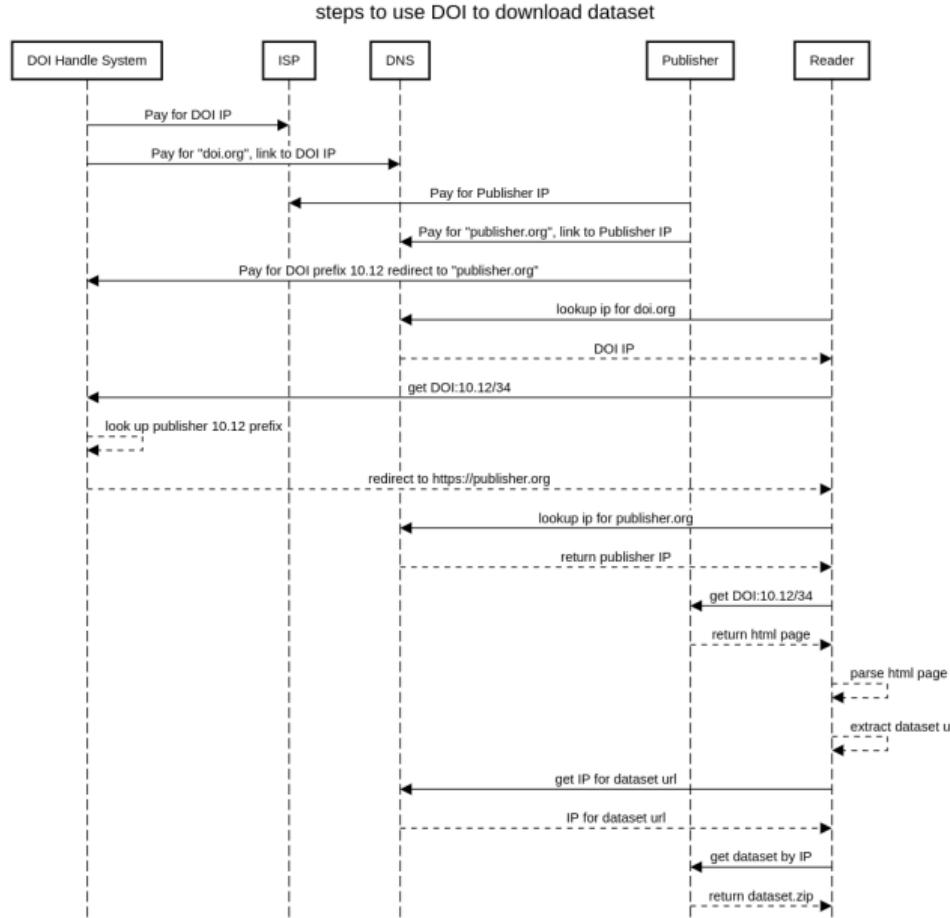
<sup>5</sup>[https://www.zotero.org/groups/5435545/bat\\_literature\\_project](https://www.zotero.org/groups/5435545/bat_literature_project)

## Accessing content associated with DOIs

Take 2.

- ▶ turn on the internet (still there?)
- ▶ open a web browser
- ▶ load <https://doi.org/10.5962/bhl.title.8322>
  - ▶ and rely on a delicate and complex socio-technical network
- ▶ inspect page
- ▶ use mouse to click on a link that looks like a bug picture
- ▶ download image and **trust** its authenticity

# DOI Economics and Redirection



## Internet Is Designed For *Exchanging* Information

*The internet is a powerful tool for exchanging digital information. But the Internet's contents changes constantly: websites are launched and taken down, webpages change, and content gets archived or lost.<sup>6</sup>*

---

<sup>6</sup>Jorrit Poelen. 2024. Unleashing Digital Knowledge Into The Future. Accessed on 2024-02-06 at <https://linker.bio>  
line:hash://sha256/8ac18eb75ff20d40d1d60bb6ad5a745eb528093d1ffbe373e3847c13146091eb!/L12

## *Internet Is Location-based*

*By design, a web address, or Uniform Resource Locator (URL), points to a specific internet location from which a resource, like a webpage, can be retrieved. However, a URL does not provide a way to verify that a retrieved webpage was the one we asked for.* <sup>7</sup>

---

<sup>7</sup>Jorrit Poelen. 2024. Unleashing Digital Knowledge Into The Future. Accessed on 2024-02-06 at <https://linker.bio>  
line:hash://sha256/8ac18eb75ff20d40d1d60bb6ad5a745eb528093d1ffbe373e3847c13146091eb!/L14

## Finding Content By Their Location Is . . . Tricky

*Imagine using a URL-like reference to find a book at a library: instead of locating a book by what it is (e.g., title, author), you refer to a book by its location (e.g., third shelf on the second row next to the window). With this, a book becomes unfindable if moved to another shelf. And, if you do manage to find a book at the referenced location, how would you know you've found the book you are looking for?*<sup>8</sup>

---

<sup>8</sup>Jorrit Poelen. 2024. Unleashing Digital Knowledge Into The Future. Accessed on 2024-02-06 at <https://linker.bio>  
line:hash://sha256/8ac18eb75ff20d40d1d60bb6ad5a745eb528093d1ffbe373e3847c13146091eb!/L16

## Finding Content By Their (Summarized) Content Is . . . What Librarians Do

*Instead of pointing to where books are located, librarians point to them using a bibliographic reference. For practical reasons, only a few identifying clues are included in such a reference (e.g., author, year of publication, title, and publisher). So, librarians refer to content by what it is, and knowing where it may be located is secondary.* <sup>9</sup>

---

<sup>9</sup>Jorrit Poelen. 2024. Unleashing Digital Knowledge Into The Future. Accessed on 2024-02-06 at <https://linker.bio>  
line:hash://sha256/8ac18eb75ff20d40d1d60bb6ad5a745eb528093d1ffbe373e3847c13146091eb!/L18